JEPPIAAR INSTITUTE OF TECHNOLOGY

Self Belief | Self Discipline | Self Respect

QUESTION BANK

REGULATION :2013

YEAR : IV

SEMESTER : 08

BATCH :2016-2020

DEPARTMENT

OF

INFORMATION TECHNOLOGY

JEPPIAAR INSTITUTE OF TECHNOLOGY

"Self-Belief | Self Discipline | Self Respect"

INSTITUTION VISION

Jeppiaar Institute of Technology aspires to provide technical education in futuristic technologies with the perspective of innovative, industrial and social application for the betterment of humanity.

INSTITUTIONMISSION

- To produce competent and disciplinedhigh quality professionals with the practical skills necessary to excel as innovative professionals and entrepreneurs for the benefit of the society.
- To improve the quality of education through excellence in teaching and learning, research, leadership and by promoting the principles of scientific analysis, and creative thinking.
- To provide excellent infrastructure, serene and stimulating environment that is most conducive to learning.
- To strive for productive partnership between the Industry and the Institute for research and development in the emerging fields and creating opportunities for employability.
- To serve the global community by instilling ethics, values and life skills among the students needed to enrich their lives.

JEPPIAAR INSTITUTE OF TECHNOLOGY

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DEPARTMENT VISION

To facilitate the evolution of problem solving skills along with knowledge application in the field of Information Technology, understanding industrial and global requirements for the benefit of the society.

DEPARTMENT MISSION

- To produce creative and productive computing graduates in software development being aware of global requirements and maximize employability.
- To enhance evolution of professional skills and development of leadership traits among the students to grow into successful entrepreneurs.
- To offer students an advantageous infrastructure to apply their research thoughts and develop their technical expertise .
- To escalate the moral code and honesty in the professional activities.

Program Educational Objectives (PEOs)

PEO1: To provide students with a fundamental knowledge in Science, mathematics and computing skills for creative and innovative application.

PEO2: To enable students competent and employable by providing excellent Infrastructure to learn and contribute for the welfare of the society.

PEO3: To channelize the potentials of the students by offering state of the art amenities to undergo research and higher education.

PEO4: To evolve computing engineers with multi-disciplinary understanding and maximize Job Opportunities.

PEO5: To facilitate students obtain profound understanding nature and social requirements and grow as professionals with values and integrity.

Program Specific Outcomes (PSOs)

PSO 1: To create the ability to analyze and enhance coding skills by participating in various competitions.

PSO 2: Students are able to provide solutions for Social Problems by creating Mobile Application Development using Android Studio and Chatbot.

PSO 3: Students are able to deal with real time problems using Machine Learning Tools and Big data Analytics.

BLOOM'S TAXONOMY

Definition:

Bloom's taxonomy is a classification system used to define and distinguish different levels of human cognition like thinking, learning, and understanding.

Objectives:

- To classify educational learning objectives into levels of complexity andspecificity. The classification covers the learning objectives in cognitive, affective and sensory domains.
- To structure curriculum learning objectives, assessments andactivities.

Levels in Bloom's Taxonomy:

- **BTL 1** – **Remember** - The learner recalls, restate and remember the learned information.
- **BTL 2** – **Understand** - The learner embraces the meaning of the information by interpreting and translating what has beenlearned.
- **BTL3**–**Apply**-Thelearnermakesuseoftheinformationinacontextsimilartothe one in which it waslearned.
- **BTL 4** – **Analyze** - The learner breaks the learned information into its parts to understand the informationbetter.
- **BTL 5** – **Evaluate** - The learner makes decisions based on in-depth reflection, criticism andassessment.
- **BTL6**–**Create**-Thelearnercreatesnewideasandinformationusingwhathasbeen previouslylearned.

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TOTAL : 45 PERIODS

TEXTBOOKS:

1. Ron Schmelzer et al. “XML and Web Services”, Pearson Education, 2002.
2. Thomas Erl, “Service Oriented Architecture: Concepts, Technology, and Design”, Pearson Education, 2005.

REFERENCES:

1. Frank P.Coyle, “XML, Web Services and the Data Revolution”, Pearson Education, 2002
2. Eric Newcomer, Greg Lomow, “Understanding SOA with Web Services”, Pearson Education, 2005
3. Sandeep Chatterjee and James Webber, “Developing Enterprise Web Services: An Architect's Guide”, Prentice Hall, 2004.
4. James McGovern, Sameer Tyagi, Michael E.Stevens, Sunil Mathew, “Java Web Services Architecture”, Morgan Kaufmann Publishers, 2003.

Subject Code: IT6801 **Year/Semester :IV/08**

Subject Name : Service Oriented Architecture **Subject Handler: Ms.J.Aruna Jasmine**

UNIT I INTRODUCTION TO XML	
XML document structure – Well formed and valid documents – Namespaces – DTD – XML Schema – XFiles.	
PART* A	
Q.NO	**QUESTIONS**
1.	**What are the major portions of XML document? [BTL2]** The major portions of an XML document include the following: • The XML declaration • The Document Type Declaration • The element data • The attribute data • The character data or XML content
2.	**What are the components of XML declaration? [BTL1]** • An XML declaration (which is technically optional, but recommended in most normal cases) • A document type declaration that refers to a DTD (which is optional, but required if you want validation) • A body or document instance (which is required)
3.	**What are the XML delimiter characters? [BTL2]** There are only five: " " ' ' < < > > & &amp
4.	**Define Document Type Declaration. [BTL2]** The Document Type Declaration (DOCTYPE) gives a name to the XML content and provides a means to guarantee the document's validity, either by including or specifying a link to a Document Type Definition (DTD).
5.	**Define elements in XML document. [BTL1]** XML elements can be defined as building blocks of an XML. Elements can behave as containers to hold text, elements, attributes, media objects or all of these. Each XML document contains one or more elements, the scope of which are either delimited by start and end tags, or for empty elements, by an empty-element tag.
6.	**Define attributes in XML. [BTL2]** When you create XML Schemas, you define the individual elements and attributes and assign valid types to them. Elements describe data, whereas attributes are like properties of an element, in that they provide further definition about the element the way that properties describe characteristics of objects and classes.

7.	**Define components in XML. [BTL2]** Comments are quite simple to include in a document. The character sequence <!-- begins a comment and --> ends the comment. Between these two delimiters, any text at all can be written, including valid XML markup. The only restriction is that the comment delimiters cannot be used; neither can the literal string --. Comments can be placed anywhere in a document and are not considered to be part of the textual content of an XML document.
8.	**Define DTD Document Type Definitions . [BTL2]** (DTDs) provide a means for defining what XML markup can occur in an XML document. Basically, the DTD provides a mechanism to guarantee that a given XML document complies with a well-defined set of rules for document structure and content. These rules provide a framework for guaranteeing the "validity" of a document. DTDs and the more recent XML Schema are the means for defining the validity constraints on XML documents.
9.	**Define XML content . [BTL2]** The content between XML elements is where most of the value lies in an XML document. In fact, that is almost exclusively where all the variable content lies. XML elements are usually well defined and strict in their application
10.	**When the document will be considered as valid documents? [BTL2]** A well-formed XML document is considered valid only if it contains a proper Document Type Declaration and if the document obeys the constraints of that declaration. In most cases, the constraints of the declaration will be expressed as a DTD or an XML Schema. Well-formed XML documents are designed for use without any constraints, whereas valid XML documents explicitly require these constraint mechanisms. In addition to constraining the possible elements and the ordering of those elements in a document, valid XML documents can take advantage of certain advanced features of XML that are not available to merely well-formed documents due to their lack of a DTD or XML Schema.
11.	**Define well-formed documents. [BTL2]** An XML document is well formed if it follows all the preceding syntax rules of XML. On the other hand, if it includes inappropriate markup or characters that cannot be processed by XML parsers, the document cannot be considered well formed. It goes without saying that an XML document can't be partially well formed.
12	**Define Namespaces in XML. [BTL2]** The xmlns attribute in the second <table> element gives the f: prefix a qualified namespace. When a namespace is defined for an element, all child elements with the same prefix are associated with the same namespace. Namespaces can also be declared in the XML root element: <root. xmlns:h="http://www.w3.org/TR/html4/"
13	**Define DTD Attributes. [BTL2]** XML attributes are name/value pairs that are used as metadata to describe XML elements. XML attributes are very similar to HTML attributes. In HTML, src is an attribute of the img tag, as shown in the following example: <img src="images/imagename.gif" width="10" height="20"> In this example, width and height are also attributes of the img tag.
14	**Define DTD Entities . [BTL1]** Entities in DTDs are storage units. They can also be considered placeholders. Entities are special markups that contain content for insertion into the XML document. Usually this will be some type of information that is bulky or repetitive. Entities make this type of information more easily

	handled because the DTD author can use them to indicate where the information should be inserted in the XML document.
15	**What are the DTD Drawbacks and Alternatives? [BTL2]** There are several drawbacks that limit the ability of DTDs to meet these growing and changing validation needs. First and foremost, DTDs are composed of non-XML syntax. Given that one of the central tenets of XML is that it be totally extensible, it may not seem to make a lot of sense that this is the case for DTDs. Additionally, there can only be a single DTD per document. It is true that there can be internal and external subsets of DTDs, but there can only be a single DTD referenced. In the modern programming world, we are used to being able to draw the programming constructs we use from different modules or classes.
16	**How to create XML Schemas? [BTL2]** Authoring an XML schema consists of declaring elements and attributes as well as the "properties" of those elements and attributes. We will begin our look at authoring XML schemas by working our way from the least-complex example to the most-complex example. Because attributes may not contain other attributes or elements, we will start there.
17	**Define XPath. [BTL2]** The XML Path Language (XPath) is a standard for creating expressions that can be used to find specific pieces of information within an XML document. XPath expressions are used by both XSLT (for which XPath provides the core functionality) and XPointer to locate a set of nodes. To understand how XPath works, it helps to imagine an XML document as a tree of nodes consisting of both elements and attributes.
18.	**Define XPointer. [BTL2]** The XML Pointer Language (XPointer), currently in the candidate recommendation stage of the W3C approval process, builds on the XPath specification. An XPointer uses location steps the same as XPath but with two major differences: Because an XPointer describes a location within an external document, an XPointer can target a point within that XML document or a range within the target XML document. You can find the complete specification at http://www.w3.org/TR/xptr.
19.	**Define XLink. [BTL2]** The anchor element, <a>, within HTML indicates a link to another resource on an HTML page. This could be a location within the same document or a document located elsewhere. In HTML terms, the anchor element creates a hyperlink to another location. The hyperlink can either appear as straight text, a clickable image, or a combination of both. Although HTML anchor elements contain a lot of functionality, they are still limiting— they require the use of the anchor element (<a>) itself, and they basically sit there waiting for someone to click them before navigating to the specified location.
20.	**Describe targeting Namespaces. [BTL3]** You can view an XML schema as a collection of type definitions and element declarations targeted for a specific namespace. Namespaces allow us to distinguish element declarations and type definitions of one schema from another. We can assign an intended namespace for an XML schema by using the targetNamespace attribute on the <schema> element. By assigning a target namespace for the schema, we indicate that an XML document whose elements are declared as belonging to the schema's namespace should be validated against the XML schema.
21.	**How to model groups? [BTL2]** A model group, at least in terms of a schema definition, is a logically grouped set of elements. A

	model group within the XML Schema Definition Language consists of a "compositor" and a list of "particles" or element declarations). A model group can be constructed using one of the following XML Schema Definition elements: • <all> • <choice> • <sequence>
22.	**What is anonymous type declaration? [BTL2]** If you look closely, you'll see the declaration of a <Name> element that does not have a type attribute specified. Instead, the <element> element, itself, contains a <simpleType> element without a name attribute specified. This is known as an "anonymous" type definition.
23.	**How to declare simple types? [BTL2]** Sometimes, it's not necessary to declare a complex element type within an XML schema. In these cases, you can use the <simpleType> element of the XML Schema Definition Language.
24.	**Define the structure of a Document Type Definition? [BTL2]** The structure of a DTD consists of a Document Type Declaration, elements, attributes, entities, and several other minor keywords. We will take a look at each of these topics, in that order. As we progress from topic to topic, we will follow a mini case study about the use of XML to store employee records by the Human Resources department of a fictitious company.
25.	**Define Ranges in XPointer. [BTL1]** An XPointer range defines just that—a range consisting of a start point and an endpoint. A range will contain the XML between the start point and endpoint but does not necessarily have to consist of neat subtrees of an XML document. A range can extend over multiple branches of an XML document. The only criterion is that the start point and endpoint must be valid.
	PART *B
1	**Explain XML document structure in detail . (13M)BTL2** **Answer : Ron Schmelzer Page 39 - 50)** The XML Recommendation states that an XML document has both logical and physical structure. Physically, it is comprised of storage units called entities, each of which may refer to other entities, similar to the way that include works in the C language. Logically, an XML document consists of declarations, elements, comments, character references, and processing instructions, collectively known as the markup. An XML document consists of three parts, in the order given: 1. An XML declaration (which is technically optional, but recommended in most normal cases) 2. A document type declaration that refers to a DTD (which is optional, but required if you want validation) 3. A body or document instance (which is required) Collectively, the XML declaration and the document type declaration are called the XML prolog.
2	**2. Explain Namespaces in Detail. (Ron Schmelzer Page 58-61) (NOV/DEC 2017) BTL5** • Domain Names - The namespace syntax for domain names is specified by the Domain Name System, or DNS. It includes the top-level domain, (e.g. "techterms.com") and a subdomain, such as "www." In the URL "www.techterms.com," the namespace identifier is "techterms.com," while the local name is www. • File Paths - File locations may be specified using a file path, which can include multiple directories. A file path, which uses syntax defined by the operating system, is considered a namespace. For example, C:\Program Files\Internet Explorer is the namespace that describes where Internet Explorer files on a Windows computer. • The namespace /usr/local/apache/ defines the location of Apache files on a Unix-based

	web server. Individual filenames within these directories serve as unique identifiers. • XML Documents - XML namespaces (XMLNS) are used to associate a document's element and attribute names with a namespace identified by an external URI. For example, an XML file may include HTML elements that are specified at "http://www.w3.org/1999/xhtml." • This reference might appear as "<html:html xmlns:html='http://www.w3.org/1999/xhtml'>" near the top of the XML document. • The above examples are just a few types of namespaces used in computing. They are also used to define network devices and other types of computer hardware. Additionally, computer programmers often used namespaces to group related variables within the source code of a program. While there are many different types of namespaces, they all serve the same purpose — to contain a logical grouping of related elements.
3	**Explain Document Type Definition in detail (Ron Schmelzer Page 67-103)** • The MFC document/view architecture makes it easy to support multiple views, multiple document types, splitter windows, and other valuable user-interface features. • The parts of the MFC framework most visible both to the user and to you, the programmer, are the document and view. Most of your work in developing an application with the framework goes into writing your document and view classes. This article family describes: • The purposes of documents and views and how they interact in the framework.What you must do to implement them. • At the heart of document/view are four key classes: • The CDocument (or COleDocument) class supports objects used to store or control your program's data and provides the basic functionality for programmer-defined document classes. • A document represents the unit of data that the user typically opens with the Open command on the File menu and saves with the Save command on the File menu. • The CView (or one of its many derived classes) provides the basic functionality for programmer-defined view classes. • A view is attached to a document and acts as an intermediary between the document and the user: the view renders an image of the document on the screen and interprets user input as operations upon the document. • The view also renders the image for both printing and print preview. • CFrameWnd (or one of its variations) supports objects that provides the frame around one or more views of a document.
4	**How to create XML Schemas? Explain in detail (Ron Schmelzer Page 116-159) (NOV/DEC 2017) Design defects** • Create a project to contain the XML schema. • In the workbench, click File > New > Other and select XML > XML Schema . Click Next. • Select the project or folder that will contain the XML schema. In the File name field, type the name of the XML schema, for example MyXMLSchema.xsd . • Click Finish.
5	**Explain X-Files in detail (Ron Schmelzer Page 169-219)** • In most operating systems, a file must have a unique name within a given file directory.

	• However, while creating a filename, certain characters are considered illegal, and hence cannot be used. • A filename is comprised of a name with a suffix, which is also known as a file extension. The file extension is two to four characters following the period in the complete filename. • The file extension helps in identifying the type of file, file format and the attributes associated with the file. • Most modern computer systems provide security or protection measures against file corruption or damage. • The data contained in the files could range from system-generated information to user-specified information. File management is done with the help of operating systems, third-party tools or done manually at times with the help of the user.
6	**Create a document type definition that defines the structure for email message, further create a XML document that reference to the created document type definitions .** • DTD stands for Document Type Definition. • A DTD defines the structure and the legal elements and attributes of an XML document. • A "Valid" XML document is "Well Formed", as well as it conforms to the rules of a DTD: <?xml version="1.0" encoding="UTF-8"?> <!DOCTYPE note SYSTEM "Note.dtd"> <note> <to>Tove</to> <from>Jani</from> <heading>Reminder</heading> <body>Don't forget me this weekend!</body> </note> • The purpose of a DTD is to define the structure and the legal elements and attributes of an XML document:
7	**Explain with examples internal and external DTD (8) [NOV/DEC 2016]** • An XML DTD can be either specified inside the document, or it can be kept in a separate document and then the document can be linked to the DTD document to use it. **Syntax** Basic syntax of a DTD is as follows – In the above syntax − • DTD starts with <!DOCTYPE delimiter. • An element tells the parser to parse the document from the specified root element. • DTD identifier is an identifier for the document type definition, which may be the path to a file on the system or URL to a file on the internet. If the DTD is pointing to external path, it is called external subset. • The square brackets [ ] enclose an optional list of entity declarations called internal subset. Internal DTD

	• A DTD is referred to as an internal DTD if elements are declared within the XML files. To reference it as internal DTD, standalone attribute in XML declaration must be set to yes. This means the declaration works independent of external source. Syntax • The syntax of internal DTD is as shown − <!DOCTYPE root-element [element-declarations]> where root-element is the name of root element and element-declarations is where you declare the elements.
	PART – C
1	**Given 6 different denominations of coins ,The program finds total dollars & cents values for a set of coins and outputs the number of dollars. Find the possible defects in the above scenario. (15M)** BTL6 **(April/May 2017)** **Answer : Appendix - Srinivasan,Ramaswamy** **Explanation:** • Requirements or functional Defects(4M) • Functional description defects • Interface description defects • Pre conditions(5M) • Post conditions • Control, Logic and sequence defects(3M) • Algorithmic and processing defects • Data flow defects(3M) • Data Defects • External
2	**If you were testing a feature of your software on Monday and finding a new bug every hour, at what rate would you expect to find bugs on Tuesday? (15M)** BTL4 **Answer : Appendix - Srinivasan, Ramaswamy** **Explanation:** • Number of bugs remaining is proportional to the number of bugs you have already found.(8M) • Pesticide paradox – Tells you that if you continue to run the same tests over and over that you eventually won't find new and different bugs until you add more tests.(7M)
3	**Visiting all the states that the program has assures that you have also traverses all the transitions among them. The statement is true or false? Justify your answer.(15M)** BTL4 **Answer : Appendix - Srinivasan Ramaswamy** **STATEMENT** :False (8M) **Explanation(7M)** • Think of visiting 50 different cities spread out across the entire United states. • You could plan a trip that would take you to each city. • But it would be impossible for you to travel all the roads that connects all the cities.

UNIT II BUILDING XML BASED APPLICATION	
Parsing XML – using DOM, SAX – XML Transformation and XSL – XSL Formatting – Modeling Databases in XML.	
PART *A	
1	**Define Smart Tester.**(BTL1) Software must be tested before it is delivered to users. It is responsibility of the testers to Design tests that (i) reveal defects (ii) can be used to evaluate software performance, usability and reliability. To achieve these goals, tester must select a finite no. of test cases (i/p, o/p, & conditions).
2	**Define responsibility.(AU Nov/Dec 2016)**(BTL1) A straightforward definition for object-responsibility is this: An object must contain the data (attributes) and code (methods) necessary to perform any and all services that are required by the object.
3	**Write short notes on Random testing and Equivalence class portioning.** (BTL1)

	(Nov/Dec 2015) Each software module or system has an input domain from which test input data is selected. If a tester randomly selects inputs from the domain, this is called random testing. In equivalence class partitioning the input and output is divided in to equal classes or partitions.
4	**Define State.** (BTL1) A state is an internal configuration of a system or component. It is defined in terms of the values assumed at a particular time for the variables that characterize the system or component.
5	**Define Finite-State machine.** (BTL1) A finite-state machine is an abstract machine that can be represented by a state graph having a finite number of states and a finite number of transitions between states.
6	**Define Error Guessing.(**BTL1) The tester/developer is sometimes able to make an educated "guess' as to which type of defects may be present and design test cases to reveal them. Error Guessing is an ad-hoc approach to test design in most cases.
7	**Define COTS Components.**(BTL1) The reusable component may come from a code reuse library within their org or, as is most likely, from an outside vendor who specializes in the development of specific types of software components. Components produced by vendor org are known as commercial off-the shelf, or COTS, components.
8	**Express the benefits of low coupling**.(BTL2) **Maintainability** – changes are confined in a single module **Testability** – modules involved in unit testing can be limited to a minimum **Readability** – classes that need to be analysed are kept at a minimum.
9	**Define usage profiles and Certification.**(BTL1) Usage profiles are characterizations of the population of intended uses of the software in its intended environment. Certification refers to third party assurance that a product, process, or service meets a specific set of requirements.
10	**Write the application scope of adequacy criteria?** (BTL4**)** • Helping testers to select properties of a program to focus on during test. • Helping testers to select a test data set for a program based on the selected properties. • Supporting testers with the development of quantitative objectives for testing • Indicating to testers whether or not testing can be stopped for that program.
11	**Define path**.(BTL1) A path is a sequence of control flow nodes usually beginning from the entry node of a graph through to the exit node.
12	**Write the formula for cyclomatic complexity? (AU Nov/Dec 2016**)(BTL1) The complexity value is usually calculated from control flow graph(G) by the formula. V(G) = E-N+2 Where The value E is the number of edges in the control flow graph The value N is the number of nodes.
13	**List the various iterations of Loop testing.** ?(BTL1) • Zero iteration of the loop • One iteration of the loop • Two iterations of the loop • K iterations of the loop where k<n • n-1 iterations of the loop • n+1 iterations of the loop
15	**What are the errors uncovered by black box testing**?(BTL1) • Incorrect or missing functions • Interface errors

	• Errors in data structures • Performance errors • Initialization or termination error.
16	**Define Equivalence class partitioning?**(BTL1) If a tester is viewing the software-under-test as a black box with well defined inputs and outputs, a good approach to selecting test inputs is to use a method called Equivalence class partitioning.
17	**Define Cause effect graphing**?(BTL1**)** Cause Effect Graph is a black box testing technique that graphically illustrates the relationship between a given outcome and all the factors that influence the outcome.
18	**What is Certification?**(BTL1) Certification refers to third-party assurance that a product, process, or service meets a specific set of requirements.
19	**What is the goal of smart tester**?(BTL1) The goal of the smart tester is to understand the functionality, input/output domain, and the environment of use for the code being tested.
20	**List the two major assumptions in Mutation testing.**(BTL1) • The component programmer hypothesis • The coupling effects
21	**List the two basic Testing strategies.**(BTL1) • Black box testing. • White box testing.
22	**What are the knowledge sources for Black box testing?**(BTL2) • Requirement • Document specification • Domain knowledge • Defect analysis data
23	**What are the knowledge sources for White box testing? (AU Nov/Dec 2015)**(BTL2) • High level design • Detailed design • Control flow graphs • Cyclomatic complexity
24	**List the methods of Black box testing?(AU Nov/Dec 2017)**(BTL1) • Equivalence class partitioning • Boundary value analysis • State transition testing • Cause and effect graphing • Error guessing
25	**List the methods of White box testing? (AU Nov/Dec 2017)**(BTL1) • Statement testing • Branch testing • Path testing • Data flow testing • Mutation testing • Loop testing
	PART* B
1	**Elaborate the qualities of a smart Tester.**BTL2 **(13M)** **Answer : page : 18 - Notes**

	• Reveal defects(4M) 1. Find the bugs before the software becomes operational 2. Find errors at the early stage (Requirement Analysis) 3. Find the weak points **4.** Situations at which error may occur • Evaluate quality(4M) 1. Ensures if software meets user requirements 2. Ensures if software meets requirement specification 3. Ensures if software meets performance criteria such as reliability, usability, portability • Finite no of test case(5M) 1. Number of test cases. 2. A test case that makes the tester to make sure that software meets all user requirements. 3. Test cases that are capable enough to make the system to crash.
2	**Discuss the test case design strategies.**BTL2 **(13M)** **Answer: page : 18 - Notes** • Two strategies • White box (clear or glass box) (2M) • Testing the software with X – Ray glasses • Black box(Functional or specification)(2M) • Testing the software blind folded. • Table: The two basic testing strategies.(9M)Page 18 in notes

3	**List and explain the types of black box testing. AU April/May 2016** BTL2 **(13M)** **Answer: Page:73 - 105 - Srinivasan & Ramaswamy** • Random testing (1M) 1. Randomly select the input. 2. Three conditions. • Equivalence class partitioning(2M) 1. Adv of Equivalence class partitioning 2. List of conditions. 3. Figure: A specification of a square root function 4. Example of equivalence class reporting table • Boundary value analysis(1M) 1. List the conditions 2. Figure: Boundaries of on Equivalence partition 3. Example of Boundary value analysis. • State Transition Testing(1M) 1. Abstract Machine 2. State graph having a finite number of states and transitions between 3. Internal configuration of system or component • Error guessing(1M) 1. Tester/Developer's past experience • Cause and Effect Graphing(2M) 1. Nodes in the graph are causes and effects 2. Tester need to identify causes and effects 3. Graph must be annotated with constraints 4. Graph is then converted into decision table 5. Columns in the decision table are converted into test cases • Requirement Based Testing(1M) 1. Test Requirement Specification 2. Explicit Requirement 3. Implicit Requirement 4. Requirement traceability Matrix • Compatibility Testing(1M) 1.Confirms working of product with different infrastructure components 2.Forward Compatibility Testing 3.Backward Compatibility testing • User documentation Testing(2M) 2. Manuals, User guidelines 3. Installation guidelines 4. Setup guidelines, Readme files 5. Software Release notes, Online help • Domain Testing(1M) 1. Needs business domain knowledge than software knowledge 2. They get trained in software ,instead of training the software professional in business domain.
4	**Discuss the various approaches in White Box test design.(13M)** **AU Nov/Dec 2016** BTL2

Answer : Page : 29 - 31 - Srinivasan & Ramaswamy

- Coverage and control flow graph(3M)
  1. Three basic primes
  2. Sequential
  3. Condition
  4. Iteration
- Coverage code logic(3M)
  1. Figure: Code sample with branch and loop.
  2. Figure: A control flow graph representation for the code.
  3. Table: A test case for the code ,that satisfies the decision
- coverage criterion.(3M)
  1. Table: Test cases for simple decision coverage
  2. Table: Test cases for condition coverage
  3. Table: Test cases for decision condition coverage.
- Path Testing (4M)
  1. Path
  2. Cyclomatic complexity formula.

5 **Evaluate test adequacy Criteria with necessary properties.(13M)** BTL3

Answer : page :27 - Srinivasa & Ramamurty

- Axioms –Set of assumptions(1M)
- Applicability Property(1M)
- Non exhaustive applicability property(1M)
- Monotonicity Property(2M)
- Inadequate Empty set(1M)
- General multiple change Property(1M)
- Anti decomposition Property(2M)
- Renaming Property(1M)
- Complexity Property(1M)
- Statement Coverage Property(2M)

6 **Demonstrate the various black box testing approaches using Equivalence partitioning and boundary value Analysis.(13M)**
Nov/Dec 2016 BTL5
Answer Page : 84,90 - Srinivasan & Ramaswamy
Equivalence Partition: (8M)
Software testing technique – divides input data of software unit into partitions of equivalent data – test cases can be derived – main principal of test cases are deigned to cover partition at least once.
Boundary value analysis: (5M)
Test case design technique to test boundary value between partitions-boundary value is an input or output value on the border of an equivalence partition.

7 **Compare static testing with that of dynamic testing and list the major difference between both.(13M)** BTL4

STATIC TESTING	DYNAMIC TESTING

	Prevention.	Cure.
	More cost-effective.	Less cost – effective.
	Greater marginal benefits.	Lesser marginal benefits.
	Comprehensive diagnostics for code.	More diagnostics for code.
	Finds more bugs.	Finds fewer bugs.
	Takes lesser time.	Takes longer time.
	Testing covers more areas.	Testing covers less areas.
	Done in verification stage.	done in validation stage.

PART *C

1	**Explain What a tester should worry about with this line from a spec. The software will allow up to 100 million simultaneous connections, although no more than 1 million will normally be used.** BTL4 **(15 M)** **Answer : Appendix - Srinivasan Ramaswamy** • Testability(4M) • It doesn't matter that typical usage is only 1 million connections.(4M) • If the specification states that 100 million are possible(4M) • The 100 million must be tested.(3M)
2	**Assume that you are assigned to test the windows calculator,** **Is it possible to test all the test cases. How do you test it systematically and explain the principle involved.** BTL6**(15M)** **Answer: Appendix - Srinivasan Ramaswamy** • Equivalence Partitioning(5M) • Grouping similar input(4M) • Grouping similar Output(4M) • Grouping similar operations of software(2M)
3	**Visiting all the states that the program has assures that you have also traverses all the transitions among them. The statement is true or false? Justify your answer.** BTL4 **(15M)** **Answer : Appendix - Srinivasan Ramaswamy** False(8M) **Explanation**(7M) • Think of visiting 50 different cities spread out across the entire United States. • You could plan a trip that would take you to each city. • But it would be impossible for you to travel all the roads that connect all the cities.

UNIT III SERVICE ORIENTED ARCHITECTURE

Characteristics of SOA, Comparing SOA with Client-Server and Distributed architectures – Benefits of SOA -- Principles of Service orientation – Service layers.

PART A

1	**Define Unit Testing (Nov/Dec 2017)** BTL1 A unit is the smallest possible testable software component that can be characterized in several ways.
2	**Write the different levels of testing.**BTL1 • Unit test • Integration test • System test • Acceptance test.
3	**List the components suitable for unit test.**BTL1 • Procedures and functions • Classes/objects and methods Procedure-sized reusable components.
4	**List the phases in the unit test planning.** (**April/May 2015)** BTL1 • Phase 1: Describe unit test approach and risks. • Phase 2: Identify unit features to be tested. • Phase 3: Add levels of detailed to the plan.
5	**Write the issues in the unit test**.BTL1 • Issue 1: Adequately testing classes. • Issue 2: Observation of objects states and state changes. • Issue 3: The retesting of classes-I • Issue 4: The retesting of classes-II
6	**What is Test harness?** (**Nov/Dec 2016)** BTL1 The auxiliary code developed to support to testing of units and components is called a test harness. The harness consists of drivers that call the target code and stubs that represent modules it calls.
7	**List the major goals of Integration test.** BTL1 • To detect defects that occurs on the interfaces of units. • To assemble the individual units into working subsystems and the finally a complete system that is ready for system test
8	**What is the advantage of Bottom up integration?**BTL1 Bottom-up integration has the advantage that the lower-level modules are usually well tested early in the integration process. This is important if these modules are candidates for reuse.
9	**What is a cluster?**BTL1 A cluster consists of classes that are related, for example, they may work together to support a required functionality for the complete system.
10	**List the several types of system tests. (Nov/Dec 2016)** BTL1 • Functional testing • Performance testing • Stress testing • Configuration testing • Security testing • Recovery testing
11	**Define Load.**BTL1 A load is a series of inputs that simulates a group of transactions.

12	**List the two major requirements of Performance testing.**BTL1 • Functional requirements • Quality requirements.
13	**What is meant by Stress testing?**BTL1 When a system is tested with a load that causes it to allocate its resources in maximum amounts, this is called stress testing.
14	**Define Recovery testing.**BTL1 Recovery testing subjects a system to losses of resources in order to determine if it can recover properly from these losses.
15	**Define Use case.**BTL1 A use case is a pattern, scenario, or exemplar of usage. It describes a typical interaction between the software system under development and a user.
16	**Define Regression testing** .BTL1 Regression testing is not a level of testing, but it is the retesting of the software that occurs when the changes are made to ensure that the new version of the software has retained the capabilities of the old version and that has no defect have been introduced due to the changes.
17	**Write the objectives of configuration testing**.BTL1 • Show that all the configuration changing commands and menus work properly • Show that all interchangeable devices are really interchangeable, and that they each enter • The proper states for the specified conditions • Show that the system's performance level is maintained when devices are interchanged,or when they fail.
18	**List the effect of security breaches**.BTL1 • Loss of information • Corruption of information • Misinformation • Privacy violations • Denial of service
19	**Define functional Testing**. BTLl Functional tests at the system level are used ensure that the behavior of the system adheres to the requirement specifications.
20	**What is load generator and Load?** BTLl An important tool for implementing system tests is a load generator. A load generator is essential for testing quality requirements such as performance and stress. A load is a series of inputs that simulates a group of transactions.
21	**What are the approaches used to develop the software?** BTLl There are two major approaches to software development • Bottom-Up • Top-Down
22	**List the objectives of configuration testing**. BTLl • Show that all the configuration changing commands and menus work properly • Show that all interchangeable devices are really interchangeable, and that they each enter the proper states for the specified conditions • Show that the system's performance level is maintained when devices are interchanged,or when they fail.
23	**List the effect of security breaches.** BTLl • Loss of information

	• Corruption of information • Misinformation • Privacy violations • Denial of service.
24	**Give the examples of security testing.**BTL2 • Password checking. • Legal and illegal entry with password. • Password Expiration. • Encryption. • Browsing. • Trap doors. • Viruses.
25	**List the areas covered during recovery testing.** BTLl • Restart. • Switchover.

	PART B

1	**How would you define a software unit? In terms of your definition, what constitutes a unit for procedural code; for object-oriented code?(13M)**BTL4
	Answer : Page : 38,261-264 - Srinivasan & Ramaswamy
	Explanation:
	• Functions, procedures, classes and methods as units
	• **Fig:** Some components suitable for unit test(1M)
	• Unit Test: Need for preparation
	  • Planning
	  • Both black box and White box
	  • Reviewe
	  • Several Tasks
	1. Unit Test Planning(4M)
	Phase I: Describe unit test approach and Risks
	Phase II: Identify unit features to be tested
	Phase III: Add levels of detail to the planning
	2. Designing the Unit Test(3M)
	  • Test Cases
	  • Test Proceedure
	3. Running and recording the results(3M)
	  • Perform the unit test in all the units of system
	  • Record the results.
	4. Test Harness(2M)
	  • Additional code included to perform testing.

2	**Why is it so important to design a test harness for reusability?(13M)**BTL2 **Answer: Page : 35 - Notes** **Explanation:** • Auxiliary code developed • Support testing of units , components (3M) • Harness consists of drivers that call the target code • Stubs that represent modules it calls.(3M)

	Fig: The test Harness(4M) Driver(2M) Stub(1M)
3	**What are the key differences in integrating procedural-oriented systems as compared to object-oriented systems?(13M)**BTL3 **Answer: Page : 35 - Notes** • Goals(2M) • Integration Strategies: i. Top – Down ii. Bottom – Up iii. Bi – Directional • Designing Integration Test: i.Black Box Approach ii.White Box Approach • Integration test strategy for procedures(5M) • Integration test strategy for classes(6M) • Critical Module characteristics
4	**Describe the activities/Tasks and responsibilities for developer/testers in support of multilevel testing.(13M)**BTL2 **Answer : Page : 261 - Srinivasan & Ramaswmy** • **Fig:** Levels of testing **Explanation:** • Levels of Testing(4M) i. Unit Test ii. Integration test iii. System Test iv. Acceptance Test • Two Approaches(4M) Bottom_Up Top_Down • Two types of Language(5M) Procedure Oriented Object Oriented
5	**Explain Integration Test with example.(13M) (Nov/dec 2016)**BTL3 **Answer: Page : 107 - Srinivasan & Ramaswamy** **Explanation:** • Goals(2M) • Integration Strategies: i. Top – Down ii. Bottom – Up iii. Bi – Directional • Designing Integration Test: 1.Black Box Approach • White Box Approach • Integration test strategy for procedures(5M) • Integration test strategy for classes(6M) • Critical Module characteristics

	• Example : Sandwich Testing
6	**Explain the different types of system testing with example.(13M)**BTL2 **Answer: Page : 130 - Srinivasan & Ramaswamy** **Explanation:** • Functional testing(1M) • Performance testing(1M) • Stress testing(1M) • Configuration testing(1M) • Security testing(1M) • Recovery testing(1M) • **Fig**: Types of System Test(4M) • **Fig:** Example of special resources needed for a performance test(3M)
7	**Explain in detail about scenario Testing.(13M)**BTL2 **Answer: Page : 130 - Srinivasan & Ramaswamy** • Two Methods(4M) i. System Scenarios ii. Use Case Scenarios • Why Scenario test?(4M) i. Learn product ii. Connect Testing to documented requirement iii. Expose failure to deliver described benefits iv. Expose expert use of program v. Bring requirement related issues • Twelve ways to create good scenarios(5M)
7	**How would you identify hardware and software for configuration testing and how would you apply website testing?(13M)(Nov/dec 2016)**BTL5 **Answer: Page : 195,198,369 - Srinivasan & Ramaswamy** **Explanation:** • Configuration testing - testing application with multiple combinations (7M) • To find out the optimal **configurations** • Web testing - focuses on web applications.(6M) • Complete testing of web-based system before going live • Help address issues before system revealed to the public.
8	**i)Explain about Defect Bash Elimination.(7M)**BTL2 **Answer : Page : 39 – Notes** • Ad-hoc Testing(2M) • Not based on written test cases(2M) • Brings together plenty of good practices(1M) • Steps in defect bash(2M) **ii)Explain about Ad-hoc Testing in detail.(6M)**BTL2 **Answer : Page : 39 – Notes** • Discovers unfound errors in software(2M)

	• Impacted due to(2M) i. Intuition ii. Previous Experience iii. Expert knowledge of the platform iv. Experience in Testing • Drawback • Figure : Ad - hoc Testing(2M)
9	**i)Explain about usability and accessibility Testing.(7M)**BTL2 **Answer : Page : 49 - Notes** **Usability testing:(4M)** • Characteristics • Quality Factors • Approach to usability • Aesthetic testing **Accessibility Testing:(3M)** • Basic accessibility • Product accesibility **ii)Explain Testing OO Model in detail.(6M)**(BTL2) • Unit Testing • Integration testing • Validate and system testing • Regression testing
10	**i)Differentiate Alpha and Beta Testing and discuss the phases in which alpha and beta testing are done?(7M)** **ii)Explain about documentation testing in detail.(6M) (Nov/Dec 2017)**BTL3 **Answer : Page : 137-140 - Srinivasan & Ramaswamy** **Alpha Testing: (4M)** • Type of acceptance testing • Performed to identify all possible **issues/bugs** • Before releasing the product to everyday users or public. • Aim to carry out the tasks that a typical user might perform. **Beta Testing:(3M)** • Second phase of **Software Testing** • Sampling of the intended audience tries the product out. • Beta Testing of a product is performed by **real users** of the software application in a **real environment**. **ii)Explanation:** • Importance of documentation testing • Main things to look for in reviewing the document • Packaging and text graphics

	• Marketing materials,ads and other inserts • Warranty/Registration • EULA • Label and stickers • Installation setup & Instructions • Users Manual • Online help
	PART – C
1	**If you are assigned to test compatibility of your product's data file formats, How would you approach the task**?(15M)BTL6 **Answer: Appendix - Srinivasan Ramaswamy** **Explanation:** • Research whether your program follows existing standards for its files.(6M) • If so, test that it meets its standards.(1M) • Equivalence partition the possible programs that would read and write your program's files.(6M) • Design test documents with representative sample of the types of data.(2M)
2	**Explain the significance of control flow graph and cyclomatic complexity with the pseudo code for the sum of n numbers(13M).(Nov/Dec 2017)**BTL6 **Answer : Appendix - Srinivasan Ramaswamy** **Explanation:** • Cyclomatic complexity is a software metric used to measure the complexity of a program.(5M) • This metric measures independent paths through the program's source code. An independent path is defined as a path that has at least one edge which has not been traversed before in any other paths.(6M) • Cyclomatic complexity can be calculated with respect to functions, modules, methods or classes within a program.(4M)
3	**What basic elements of a web page can easily be tested with black box Approach?(15M)**BTL6 **Answer : Appendix - Srinivasan Ramaswamy** **Explanation:** • The elements that are similar to what is multimedia CD – ROM software – text graphics ,and hyperlinks.(3M) • Web testing - focuses on web applications.(6M) • Complete testing of web-based system before going live (3M) • Help address issues before system revealed to the public.(3M)

UNIT IV WEB SERVICES

Service descriptions – WSDL – Messaging with SOAP – Service discovery – UDDI – Message Exchange Patterns – Orchestration – Choreography –WS Transactions.

PART* A	
1	**Define Goal in testing.**BTL1 A Goal can be described as a statement of intent or a statement of a accomplishment of an individual test person.

2	**What are the three types of goals in testing?**BTL1 • Business Goal • Technical Goal • Political Goal
3	**Define the term policy.(Nov/Dec2016)**BTL1 A policy can be defined as a high-level statement of principle or course of action that is used to govern a set of activities in an organization.
4	**Define Test Plan**.(**Nov/Dec 2015)**BTL1 A Plan is a document that provides a frame work or approach for achieving a set of goals.
5	**List the various Test Plan components.(Nov/Dec2016)**BTL1 • Test Plan identifier • Introduction • Items to be tested • Features to be tested • Pass/Fail criteria • Suspension & Resumption criteria • Testing tasks Test environment • Risks & Contingencies • Testing costs • Approvals
6	**Define Features**.BTL1 Features may be described as distinguishing characteristics of a software component or system.
8	**What is the meaning of the term Pass / Fail Criteria**?BTL1 Given a test item and a test case, the tester must have a set of criteria to decide on whether the test has been passed or failed upon execution.
9	**What is Suspension & Resumption criteria?**BTL1 The criteria to suspend and resume testing are described in the simplest of cases testing is suspended at the end of a working day and resumed the following morning.
10	**Define Work Breakdown Structure (WBS)**.BTL1 A Work Break Down structure is a hierarchical or tree like representation of all the tasks that are required to complete a project.
11	**Define Risks & Contingencies.**BTL1 Every testing effort has risks associated with it. Testing software with a high degree of critically, complexity, or a tight delivery deadline all impose risks that may have negative impacts on project goals.
12	**What is Cost Drive?**BTL1 A Cost Driver can be described as a process or product factor that has an impact on overall project costs.
13	**What are the various components of the test plan**.**AU Nov/Dec2016**BTL1 • Test Design Specification • Test Case Specification • Test Procedures specifications
14	**Define Test Summary Report**.BTL1 This report is prepared when testing is complete. It is summary of the results of the testing efforts. It also becomes a part of the projects historical database and provides a basis for lessons learned as applied to future projects.
15	**List the skills needed by a Test specialist**.BTL1 • Organizational and planning skills

	• The ability to keep track of and pay attention to details • The determination to discover and solve problems • The ability to mentor and train others • The ability to work with users and clients • The ability to think creatively
16	**What is the use of V-model in testing**?BTL1 The V-model is model that illustrates how testing activities can be integrated in to each phase of the standard software life cycle.
17	**Write the WBS elements for testing.** BTL1 • Project start-up • Management coordination • Tool selection • Test planning • Test design • Test development • Test execution • Test measurement, and monitoring • Test analysis and reporting • 10. Test process improvement
18	**What is the function of Test Item Transmittal Report or Locating Test Items?**BTL2 Suppose a tester is ready to run tests on the data described in the test plan. We needs to be able to locate the item and have knowledge of its current status. This is the function of the Test Item Transmittal Report. Each Test Item Transmittal Report has a unique identifier.
19	**Define Test Log.** BTL1 The Test log should be prepared by the person executing the tests. It is a diary of the events that take place during the test. It supports the concept of a test as a repeatable experiment.
20	**What are the Three critical groups in testing planning and test plan policy?(April/May 2015)**BTL1 • Managers: • Developers/Testers • Users/Clients
21	**What is scenario Testing?** The process of giving the usage scenario of the system in the clien's point of view and checking how the system reacts to it is called as scenario Testing.
22	**What are the information present in the Test Item Transmittal Report or Locating Test Items?**BTL1 • Version/revision number of the item • Location of the item • Person responsible for the item (the developer) • References tyo item documentation and test plan it is related to. • Status of the item • Approvals – space for signatures of staff who approve the transmittal.
23	**What are the skills needed by a test specialist?** BTL1 • Personal and managerial Skills • Organizational, and planning skills, work with others, resolve conflicts, mentor and train others, written /oral communication skills, think creatively.

	• Technical Skills • General software engineering principles and practices, understanding of testing principles and practices, ability to plan, design, and execute test cases, knowledge of networks, database, and operating System.
24	**Write the test term hierarchy?** BTL2 • Test Manager • Test leader • Test Engineer • Junior Test Engineer
25	**Write the approaches to test cost Estimation?** BTL2 • The COCOMO model and heuristics • Use of test cost drivers • Test tasks • Tester/developer ratios • Expert judgment
	PART* B
1	**Explain the role of the 3 critical groups in software testing. (13M)** BTL2 **Answer: Page: 321 - Srinivasan & Ramaswamy** **1. Managers**(4M) • Task forces,policies,standards • Planning • Resource allocation • Support for education and training • Interact with users **2. Developers/ testers**(5M) • Apply black and white box methods • Assist with test planning • Test at all levels • Train and mentor • Participate in task forces • Interact with users **3. Users/clients**(4M) • Specify requirements clearly • Participate in usability test
2	**Explain the various documents involved in reporting Test Results. (13M)**BTL2 **Answer: Page : 59 - Notes** **Explanation:** • Test log(1M) • Test log identifier(2M) • Description(1M) • Activity and event entities(1M) • Test incident report(3M) • Test incident report identifier(1M) • Summary(1M) • Impact(1M) • Test summary report(2M)

3	**Explain the various Test Plan attachments? (13M)** BTL2 **Answer: Page : 381 - Srinivasan & Ramaswamy** **Explanation:** • Test design specifications(4M) • Test case specifications(5M) • Test procedure specifications(4M)
4	**Discuss in detail about the test plan components.(13M)(Nov/Dec 2016,Nov/Dec 2017)** BTL2 **Answer: Page : 59 – Notes** **Test Plan Components(13M)** • Test plan identifier(5M) • Introduction • Items to be tested • Features to be tested • Approach • Pass/fail criteria(4M) • Suspension and resumption criteria • Test deliverables • Testing tasks • Test environment • Responsibilities(4M) • Staffing and training needs • Scheduling • Risks and contingencies • Testing costs • Approvals
5	**Evaluate the testing and debugging goals and policies in detail.(13M)(April/May 2017)** BTL5 **Answer: Page :62 - Notes** **Explanation:** • Debugging goal (4M) • Debugging policy(4M) • Testing Policy: Organization X(3M) • Debugging policy: Organization X(2M)
6	**Describe Test planning in detail. (13M)** BTL2 **Answer:Page : 352 - Srinivasan & Ramaswamy** **Explanation:** • Planning(1M) • Milestone (1M) • Overall test objectives(2M) • What to test (Scope of the tests) (1M) • Who will test? (2M) • How to test? (2M) • When to test? (2M) • When to stop Testing? (2M)
7	**Explain in detail about Mutation testing. (13M) (April/May 2017)** BTL2 **Answer: Page : 58 - Notes** **Explanation:** • Mutation testing is a method of software testing in which program or source code is

	deliberately manipulated(4M) • Followed by suite of testing against the mutated code(5M) • The mutations introduced to source code are designed to imitate common programming errors.(4M)
8	**Discuss in detail about the various skills needed by test specialist.(13M) (Nov/dec2017)**BTL2 **Answer: Page : 352 - Srinivasan & Ramaswamy** • **Personal and managerial Skills**(7M) ➢ Organizational, and planning skills, work with others, resolve conflicts, mentor and train others, written /oral communication skills, think creatively. • **Technical Skills**(6M) • General software engineering principles and practices, understanding of testing principles and practices, ability to plan, design, and execute test cases, knowledge of networks, database, and operating System.
9	**Explain the organizational structure for testing in single product companies.(13M)** BTL2 **(April/May 2017)** **Answer:Page :321 - Srinivasan & Ramaswamy** **Explanation:** • Exploits the rear loading nature of testing activities.(2M) • Enables Engineers to gain experience in all aspects of life cycle(4M) • Is amenable to the fact that the organization mostly has informal processes.(2M) • Some defects may be detected earlier.(3M) • Accountability for testing quality reduces.(1M) • Schedule pressures normally compromise testing.(1M)
	PART* C
1	**Describe pesticide paradox and how bring in new people to look at the software helps solve it.(15M)**BTL5 **Answer: Page : Appendix - Srinivasan Ramaswamy** This is the situation that occurs if you continue to test (3M) • Software with the same tests or same people.(4M) • Eventually, the software seems to build up immunity to the test because no new bugs are found.(3M) • If you change the tests or bring in new testers ,you will find new bugs.(2M) • The bugs are already there, it's the new technique which made the bugs visible.(3M)
2	**Why is the process of creating the test plan matters ,not the plan itself? (15M)**BTL5 **Answer: Page: Appendix - Srinivasan Ramaswamy** • Because all the issues and the questions defined in the test plan either impact or influenced by other project functional groups or team members.(4M) • Getting everyone to understand and agree to the contents of the plan is what matters.(4M) • Privately creating a paper document and putting it on a shelf is not just a waste of time, but also jeopardizes the project.(7M)
3	**Justify the statement " A schedule should be made to meet absolute dates ,so that there s no question when a testing task or phase is to start and when it is to end".(15M)** BTL6 **Answer: Page : Appendix - Srinivasan Ramaswamy**

	• The statement is false (3M) • Because testing depends so much on other aspects of the project(5M) • For example ,you can't test something until its coded), a test schedule is best made relative to the delivery status.(7M)
4	**Name a few typical testing resources that should be considered when test planning.(15M)** BTL6 **Answer: Page : Appendix - Srinivasan Ramaswamy** • People, Equipment, Offices, Labs , Software ,Outsourcing Companies and miscellaneous supplies.(3M) • What are the entrance and exit criteria?(4M) • The requirements must be met to move from one testing place to another.(3M) • A Phase can't be left until its exit criteria are met.(3M) • A new phase can't be entered until its entrance criteria are met.(2M)

UNIT V BUILDING SOA BASED APPLICATION	
Service Oriented Analysis and Design – Service Modeling – Design standards and guidelines -- Composition – WS-BPEL – WS-Coordination – WS-Policy – WS-Security – SOA support in J2EE	
PART * A	
1	**Define the term Project monitoring.**BTL1 • Project Monitoring refers to activities and tasks managers engage in to periodically check the status of each project. • Reports are prepared that compare the actual work done to the work that was planned.
2	**Define the term Project controlling.** BTL1 Project Controlling consists of developing and applying a set of corrective actions to get a project on track when monitoring shows a deviation from what was planned.
3	**Define Milestones. (Nov/Dec2016)** BTL1 Milestones are tangible events that are expected to occur at a certain time in the project's lifetime. Managers use them to determine project status.
4	**Differentiate version control and change control.**BTL2 • Version Control combines procedures and tools to manage different versions of configuration objects that are created during software process. • Change control is a set of procedures to evaluate the need of change and apply the changes requested by the user in a controlled manner.
5	**What are the goals of Reviewers?**BTL1 • Identify problem components or components in the software artifact that need improvement. • Identify components of the software artifact that donot need improvement. • Identify specific errors or defects in the software artifact. • Ensure that the artifact confirms to organizational standards.
6	**What are the benefits of a Review program?**BTL1 • Higher quality software • Increased productivity • Increased awareness of quality issues • Reduced maintenance costs • Higher customer satisfaction
7	**What are the Various types of Reviews?**BTL1 • Inspections • Walk Throughs
8	**Conclude on the need of Integration testing. (AU Nov/Dec2016)** BTL2 • Component integration testing that checks the interconnections between various parts (components) in a product. • System integration testing that tests the connections between the product and external systems.
9	**What is Inspections?**BTL1 It is a type of review that is formal in nature and requires pre review preparation on the part of the review team.The Inspection leader prepares is the checklist of items that serves as the agenda for the review.
10	**What is Walkthrough? (Nov/Dec 2017)** BTL1

	It is a type of technical review where the producer of the reviewed material serves as the review leader and actually guides the progression of the review .It have traditionally been applied to design and code.
11	**List out the members present in the Review Team.**BTL1 • SQA(Software Quality Assurance) staff • Testers • Developers • Users /Clients. • Specialists.
12	**List the components of review plans.**(**AU April/May 2015)**BTL1 • Review Goals • Items being reviewed • Preconditions for the review. • Rolls, Team size, participants • Training requirements. • Review steps. • Time requirement
13	**What are the advantages of review approach.**BTL1 There are two pass approach for detect detection. • Pass 1 has individuals first reading reviewed item • Pass 2 has the item read by the group as a whole.
14	**What are the various roles in review program?**BTL1 • Review Leader • Review Recorder • Reader Reviewer
15	**List the various review team membership constituency Review Team Members**.BTL1 • SQA Staff • Testers • Developers • Users / Clients • Specialists
16	**What are the various different types of software artifacts.** BTL1 • Requirement Reviews • Design Reviews • Code Reviews • Test Plan reviews
17	**Define Change Control Board (CCB**).BTL1 • There are 2 aspects of change control – one is tool based, the other term based. • The team involved is called CCB.
18	**Define Project monitoring**.BTL1 Project monitoring refers to the activities and tasks managers engage into periodically check the status of each project .Reports are prepared that compare the actual work done to the work that was planned or tracking**.**
19	**Define Project Controlling.**BTL1 It is the process of developing and applying a set of corrective actions to get a project on track when monitoring shows a deviation from what was planned.

20	**Define Defect Removal Leverage (DRL).**BTL1 This is a ratio of the defect detection rates from two review or test phases and can be expressed as $\text{DRL} = \frac{\text{Defects / hour (review or test phase X)}}{\text{Defects / hour (review or test phase Y)}}$
21	**What are the various steps in the inspection process**?BTL1 • Entry Criteria • Initiation • Preparation • Inspection Meeting • Reporting results • Rework & follow up
22	**What is the Role of process in Software quality?**BTL1 • Capability Maturity Model. • Testing Maturity model (TMM)
23	**List the measurements and milestones for monitoring and controlling**.BTL1 • Measurements for monitoring testing status • Coverage measures • Test case development • Test execution • Test harness development • Measurements to monitor tester productivity • Measurements for monitoring testing costs • Measurements for monitoring errors, faults, and failures • Monitoring test effectiveness
24	**Overview of the Testing Maturity Model(TMM)& the test related activities that should be done for V-model architecture.**BTL1 • Test related issues • Benefits of test process improvement • Introduction to TMM • TMM levels
25	**List the criteria for test completion**.BTL1 • All the planned tests that were developed have been executed and passed • All specified coverage goals have been met • The detection of a specific number of defects has been accomplished • The rates of defect detection for a certain time period have fallen below a specified level , Fault seeding ratios are favorable
	PART * B

1	**Illustrate with a sketch describe the design and architecture for test automation. (13M)(Nov /Dec ,2016)**BTL1

	Answer: Page : 396 - Srinivasan & Ramaswamy **Explanation:** • External modules.(3M) • Scenario and configuration file modules.(3M) • Test cases and test framework mdules.(3M) • Tools and results modules.(2M) • Report generator and report metrics modules.(2M)
2	**Explain the various generations of automations and the skills for each.(13M) (Nov/Dec,2017)** BTL1 **Answer:Page :392 - Srinivasan & Ramaswamy** **Explanation:** • First Generation – Record and playback(4M) • Second Generation – Data Driven(5M) • Third Generation - Action Driven(4M)
3	**Explain the design and architecture of test automation and list the challenges.(13M)(April /May ,2017).**BTL2 **Answer:Page :396 - Srinivasan & Ramaswamy** **Explanation:** • External modules.(2M) • Scenario and configuration file modules.(2M) • Test cases and test framework modules.(2M) • Tools and results modules.(2M) • Report generator and report metrics modules.(2M) • Challenges(3M) • Certain types of testing cannot be executed without automation. • Automation means end to end not test execution alone.
4	**Discuss in detail about the controlling and monitoring: three critical views. (13M)** BTL2 **Answer:Page : 71 – Notes** **Explanation:** • Measurements for monitoring testing status(1M) • Coverage measures(1M) • Test case development(2M) • Test execution(1M) • Test harness development(2M) • Measurements to monitor tester productivity(2M) • Measurements for monitoring testing costs(1M) • Measurements for monitoring errors, faults, and failures(1M) • Monitoring test effectiveness(2M)

5	**Explain in detail about the role of reviews in testing software deliverables. (13M)** BTL2 **Answer: Page : 68 - Notes** **Planning the Review** (5M**)** • The role and responsibilities of the review leader • Identifying the deliverable to review and its review criteria • Developing review checklists for the reviewers based on requirements • Selecting the review team and assign review duties **Conducting the Review** (4M) • The role and responsibilities of the review leader • Inform the reviewers of their review duties, tasks, and schedule • Collect the reviews in a review meeting • Dealing with interpersonal issues • Common review pitfalls and how to avoid them **Report and Follow-up on the Review**(4M) • The role and responsibilities of the review leader • Compile the review findings into a single review report • Track review findings or issues • Follow-up on review findings or issues
6	**Describe the various metrics and measurements in software testing and explain the various areas of metrics. (13M) (Nov/Dec 2016)** BTL2 **Answer: Page: 420 - Srinivasan & Ramaswamy** **Explanation:** • Project metrics(2M) • Effort variance(3M) • Schedule Variance(3M) • Effort Distribution across phase(5M)
	PART * C
1	**How will you differentiate tools and automation? Name the few benefits and drawbacks of using software test tools and automation. (15M)** BTL6 **Answer: Page : Appendix - Srinivasan Ramaswamy** • A testing tool will help you test .making it easier for you to perform a manual testing task.(3M) • Automation is also a tool but it will run without your intervention.(3M) • Think power saw and hammer building a house while the carpenter sleeps.(3M) **Benefits**:(3M) • Speed up the amount of time it takes to run your test process. • Precise and relentless. **Drawbacks**:(3M) • Because software can change during the product's development, your test tools will be need to change. • It is easy to rely on automation much.
2	**If you were using metrics from the bug – tracking database to measure your progress or success at testing, why would just counting the number of bugs you find per day or computing your average find rate be an insufficient measure? (15M)** BTL6 **Answer: Page : Appendix - Srinivasan Ramaswamy**

	• It does not tell the entire story. You could be testing the complex area of the software. (4M) • Your area could have been written by the most experienced programmer. (4M) • It could have been written by the least experienced programmer. (4M) • The code that you are testing may already have been tested or may be brand new. (3M)
3	**"The test team is responsible for the quality of the product" Does the statement make sense, Justify your answer with necessary explanation. (15M)**BTL6 **Answer: Page : Appendix - Srinivasan Ramaswamy** • False! Testing looks for bugs .(7M) • Testers didn't put the bugs in the product and can't guarantee when they are done testing that no more bugs exist.(8M)

GE6075 Professional Ethics in Engineering

Objectives:

- To enable the students to create an awareness on engineering ethics and human values, to instill moral and social values and loyalty and to appreciate the rights of others.

Unit I Human Values 10

Morals, Values and Ethics – Integrity – Work ethic – Service learning – Civic virtue – Respect for others – Living peacefully – Caring – Sharing – Honesty – Courage – Valuing time – Cooperation – Commitment – Empathy – Self confidence – Character – Spirituality – Introduction to yoga and meditation for professional excellence and stress management.

Unit II Engineering Ethics 9

Senses of 'engineering ethics' – Variety of moral issues – Types of inquiry – Moral dilemmas – Moral autonomy – Kohlberg's theory – Gilligan's theory – Consensus and controversy – Models of professional roles – Theories about right action – Self-interest – Customs and religion –Uses of ethical theories.

Unit III Engineering as social experimentation 9

Engineering as experimentation – Engineers as responsible experimenters – Codes of ethics – a balanced outlook on law.

Unit IV Safety, responsibilities and rights 9

Safety and risk – Assessment of safety and risk – Risk benefit analysis and reducing risk – Respect for authority – Collective bargaining – Confidentiality – Conflicts of interest – Occupational crime– Professional rights – Employee rights - Intellectual property rights (IPR) – Discrimination.

Unit V Global issues 8

Multinational corporations – Environmental ethics – Computer ethics – Weapons development Engineers as managers – Consulting engineers – Engineers as expert witnesses and advisors – moral leadership –Code of conduct – Corporate social responsibility.

Total: 45 Periods

Outcomes:

Upon completion of the course, the student should be able to apply ethics in society, discuss the ethical issues related to engineering and realize the responsibilities and rights in the society.

Text Books:

1. Mike W. Martin and Roland Schinzinger, "Ethics In Engineering", Tata Mcgraw Hill, New Delhi, 2003.
2. Govindarajan M, Natarajan S, Senthil Kumar V. S, "Engineering Ethics", Prentice Hall Of India, New Delhi, 2004.

References:

1. Charles B. Fleddermann, "Engineering Ethics", Pearson Prentice Hall, New Jersey, 2004.
2. Charles E. Harris, Michael S. Pritchard And Michael J. Rabins, "Engineering Ethics – Concepts And Cases", Cengage Learning,2009.
3. John R Boatright, "Ethics And The Conduct Of Business", Pearson Education, New Delhi,2003
4. Edmund G Seebauer And Robert L Barry, "Fundamentals Of Ethics For Scientists And Engineers", Oxford University Press, Oxford, 2001.
5. Laura P. Hartman And Joe Desjardins, "Business Ethics: Decision Making For Personal Integrity And Social Responsibility" Mc Grawhill Education, India Pvt. Ltd.,New Delhi,2013.
6. World Community Service Centre, ' Value Education', Vethathiri Publications, Erode, 2011

SUB CODE: GE6075 SUB NAME: PROFESSIONAL ETHICS IN ENGINEERING

SUBJECT HANDLER: Ms.S.SCINTHIA CLARINDA YEAR /SEM: IV/08

	UNIT –I HUMAN VALUES
	Morals, values and Ethics – Integrity – Work ethic – Service learning – Civic virtue – Respect for others – Living peacefully – Caring – Sharing – Honesty – Courage – Valuing time – Cooperation – Commitment – Empathy – Self-confidence – Character – Spirituality – Introduction to Yoga and meditation for professional excellence and stress management.
Q.NO	**PART * A**
1	**What are human values?**BTL2 Values decide the standard of behavior. Some universally accepted values are freedom justice and equality. Other principles of values are love, care, honesty, integrity, self-respect.
2	**Define ethics. What are ethical values?(MAY-JUNE 2016) (NOV-DEC 2015)** BTL2 the philosophical study of the moral value of human conduct and of the rules and principles that ought to govern it. Trustworthiness, respect, responsibility, fairness, caring is ethical values
3	**Distinguish values from ethics and culture. (MAY-JUNE 2016)** BTL4 Values are mainly related to individuals and since they are related to justice, they remain the same for everyone. E.g. Truth, honesty, empathy, self respect. Values do not change from individual to individual. Ethics is common to a group of individuals; the group may be religious or professional. Ethics is mostly based on some code or law and judgment of any action is based on code of conduct or law. Ethics change from individual to individual Culture commonly refers to conduct of a group. e.g system of worship, marriage. It may differ from society to society, nation to nation or religion to religion.
4	**What is integrity? (NOV-DEC2018)** BTL2 Integrity is the unity of character based on moral values. Consistency in attitudes, emotions and conduct in relations to morally justified actions and values are also the part of integrity of individual. It implies honesty, trustworthiness.

5	**What is courage as a value?** BTL2 Courage implies self-respect and governs confrontations with danger and risk. It is not excessive rashes or cowardice, but it is the middle ground. Taking calculated risks and boldness in facing crises are the hallmarks of courage as a human value. It defines the mental makeup of an individual in taking bold decisions even under adverse situations.
6	**Define work ethics.**BTL2 By one's work one cannot harm others. Any worker cannot escape accountability. Worker has the moral responsibility to see that no other person's right, private or freedom is impaired or transgressed.
7	**What is service learning? (APR-MAY 2017)** BTL2 Service learning tells that one has moral responsibility to increase the desirable effects and to decrease the harmful effects. Any service should increase the desirable result.
8	**Mention some civic virtues.** BTL1 Good citizen demand civic virtue. It is the principle of not harming the surroundings .it also includes living peacefully, respect for others, protecting the environment and being normally and ethically good.
9	**Write short notes on caring and sharing.** BTL3 Caring is the essence of moral life. Caring involves feelings, relationship, contends with other persons and protecting others and causing least damage to others. Sharing means sharing of feelings, ideas thoughts, resources and profits. Sharing is always mutually beneficial. Sharing morally acceptable feelings, resources and materials is a value.
10	**Write notes on honesty.** BTL3 Any human being should imbibe honesty-honesty in acts, honesty in speech and honesty in beliefs. Honesty is the fundamental virtue in human relationship even though in may be difficult to follow some times.
11	**Give short notes on co-operation.** BTL1 Co-operation means extending help to others, for a good cause. Co-operation may be through an idea, a suggestion, an assistance or physical work which extends to others for common benefit.
12	**Define empathy.** BTL2 Empathy means putting self in a position of someone else and thinking as the later and reasoning suitable action.
13	**Write a note on Integrity.** BTL2 Integrity is the bridge between responsibility in private and professional life.
14	**What do you mean by Compromise?** BTL2 In a negative sense it means to undetermined integrity by violating one's fundamental moral principles. In a positive sense, however, it means to settle differences by mutual concessions or to reconcile conflicts through adjustments in attitude and conduct.
15	**Give the two aspects of Honesty.(NOV-DEC 2016)** BTL1 Truthfulness – meeting responsibilities concerning truth-telling. Trustworthiness –Meeting responsibilities concerning trust.
16	**Differentiate Self-respect and Self-esteem.** BTL4 Self-respect: It is a moral concept; refers to the virtue properly valuing oneself. Self-esteem: It is a psychological concept; means having a positive attitude toward Oneself, even if the attitude is excessive or otherwise unwarranted.

17	**What are Human values? (NOV –DEC 2016)** BTL2 Values are the rules by which we make decisions about right and wrong, should and shouldn't, good and bad. "Emotional beliefs in principles regarded as particularly favorable or important for the individual." Types of Values: (a) Right conduct, (b) Peace (c) Truth, (d) Love, (e) Nonviolence.
18	**What are the factors that demonstrate a strong work ethic?** BTL2 1 Integrity, 2 Sense of Responsibility 3 Emphasis on Quality 4 Discipline 5 Sense of Teamwork.
19	**List the characteristics of a Good Work Ethic.** BTL1 Reliability, Dedication, Productivity, Cooperation, and Character
20	**State the term called civic virtue.** BTL1 Civic virtues are the moral duties and rights, as a citizen of the village or the country or an integral part of the society and environment. **Civic virtues are divided into four categories**: 1. Civic Knowledge 2. Self-Restraint 3. Self-Assertion 4. Self-Reliance
21	**Give short notes on Respect for others.** BTL1 Respect is a positive feeling of admiration or deference for a person. Respect can be a specific feeling of regard for the actual qualities of the one respected. It can also be conduct in accord with a specific ethic of respect. Treating people with respect makes your world a nicer place to live in, whether it's at home, at school, or out in your community. Don't insult people or make fun of them.
22	**Write a note on living peacefully.** BTL3 To live peacefully, one should start install peace within (self). Charity begins at home. Then one can spread peace to family, organization where one works, and then to the world, including the environment. Only who are at peace can spread peace. You cannot gift an article which you do not possess. The essence of oriental philosophy is that one should not fight for peace. It is oxymoron. War or peace can be won only by peace, and not by wars.
23	**Write short notes on various terms Self- Confidence, Character and Spirituality.** BTL3 **(May/June 16)(NOV-DEC2018) (NOV-DEC 2015)** **Self- Confidence**: Certainty in one's own capabilities, values, and goals. These people are usually positive thinking, flexible and willing to change. They respect others so much as they respect themselves. **Character**: To determine the ideals. **Spirituality:** Spirituality is a way of living that emphasizes the constant awareness and recognition of the spiritual dimension (mind and its development) of nature and people, with a dynamic balance between the material development and the spiritual development.
24	**Define moral values. (APR- MAY 2017) (APR- MAY 2015) (NOV-DEC 2015)**BTL2 Moral value is value that must be separated with other values. Every value will get quality if it has relation with other values. For example, Honesty is example of moral values; this value

<table>
<tr><td></td><td>has no meaning if it does not be applied with other values. Economic Value is relation of human and thing. Thing is needed because its usefulness. Economic Value relate with purpose value. Loyalty is moral value, but it must be applied with other, humanity value for general, for example, love of husband and wife.</td></tr>
<tr><td>25</td><td>Define spirituality. (NOV-DEC 2015)BTL2
, “Spirituality is often experienced as a source of inspiration or orientation in life. It can encompass belief in immaterial realities or experiences of the immanent or transcendent nature of the world.”</td></tr>
<tr><td>26</td><td>Difference between Mortality and Ethics. [Dec 2012] BTL4
<table>
<tr><td>Mortality</td><td>Ethics</td></tr>
<tr><td>Based on customs and tradition.</td><td>It is a critical reflection of moral</td></tr>
<tr><td>Concerned with wrong action when done</td><td>Concerned with right action when not</td></tr>
<tr><td>Top Priority is given because damage is</td><td>Less priority & less serious</td></tr>
<tr><td>Example: corruption and crime</td><td>Example: belief about manners</td></tr>
</table></td></tr>
<tr><td></td><td>PART * B</td></tr>
<tr><td>1</td><td>Explain some important human values. (13M) (April 2014) BTL2

Answer Page.no.0.1 to 0.2 - V.Jayakumar

Important human values :(9 M)
The five core human values are: (1) Right conduct, (2) Peace, (3) Truth, (4) Love, and (5) Nonviolence.
1. values related to right conduct are:
(a) Self-help skills: care of possessions, diet, hygiene, modesty, posture, self reliance, and tidy appearance
(b) Social skills: good behavior, good manners, good relationships, helpfulness, no wastage, and good environment.
(c) Ethical skills: code of conduct, courage, dependability, duty, efficiency, ingenuity, initiative, perseverance, punctuality, resourcefulness, respect for all, and responsibility.
2. Values related to peace are: attention, calmness, concentration, contentment, dignity, discipline, equality, equanimity, faithfulness, focus, gratitude, happiness, harmony, humility, inner silence.
3. Values related to truth are: accuracy, curiosity, discernment, fairness, fearlessness, honesty, integrity (unity of thought, word, and deed), intuition, justice.
4. Values related to love are: acceptance, affection, care, compassion, consideration, dedication, devotion, empathy, forbearance, forgiveness, friendship, generosity.
5. Values related to non-violence are:
(a) Psychological: benevolence, compassion, concern for others, consideration , forbearance, forgiveness, manners, happiness, loyalty, morality, and universal love
(b) Social: appreciation of other cultures, religions, brotherhood, care of environment, citizenship, equality, harmlessness,</td></tr>
</table>

	c) Perseverance persistence, determination, resolution, tenacity, dedication, commitment, constancy, steadfastness, stamina, endurance and indefatigability. d) Accuracy means freedom from mistake or error; conformity to truth or to a standard or model and exactness. e) Discernment means discrimination, perception, penetration, and insight. Discernment, powers to see not obvious to average mind. Stresses accuracy, especially in reading character, motives. **Evolution of Human Values: (4 M)** The human values evolve because of the following factors: 1. The impact norms of the society, fulfillment of the individual's needs or desires. 2. Developed or modified one's own awareness, choice, and judgment in fulfilling the needs. 3. By the teachings and practice of Preceptors (Gurus) or Saviors or religious leaders. 4. Fostered or modified by social leaders, rulers of kingdom, and by law (government).
2	**Write a detailed note on work ethics. Problems exist in the industrial/business scenario(13 M)** BTL3 **Answer Pg.no.0.1 to 0.2 - V.Jayakumar** **DEFINITION:(2 M)** Work ethics is defined as a set of attitudes concerned with the value of work, which forms the motivational orientation. The 'work ethics' is aimed at ensuring the economy productivity , safety , health and hygiene, privacy , security , cultural and social development (leisure, hobby, and happiness), welfare (social work), environment (anti-pollution activities), and offer opportunities for all, according to their abilities, but without discrimination. **ELEMENTS OF A STRONG WORK ETHIC: (6 M)** **1. Interpersonal skill:** It include the habits, attitude, manners, appearance and behaviors which affect how we get along with other people **2. Initiative:** Without initiative procrastination and missed opportunities can become problem. **3. Professionalism** Being professional involves everything, how you dress and present yourself in business world, way you treat others. **4. Accountability** Take personal responsibility, actions and out comes, every situation. Mistakes taken as learning experiences, ability to always better, must be upholder.

	5. Respectfulness Serving a customer, meeting with a client or collaborating with colleagues, do best respect everyone's opinions, especially under difficult circumstances. Value people's individual worth, their professional contributions. **6. Dedication** Don't stop until job done, and done right. Fully dedicated, to strive, to achieve, best results alongside putting extra hours,get things right. **7. Determination** Don't let obstacles stop, enthusiastically embrace challenges, job as an entrepreneur solve clients' problems. **8. Humility** Acknowledge everyone's contributions, and freely share credit accomplishments. Gratitude to colleagues who work hard, and appreciation to loyal clients. 9.**Dependability** Relates closely to when always on time and prepared for meetings. The ability to deliver work on time. **Many complex social problems exist in the industrial/business scenario, because: (5 M)** 1. Desire to be recognized as individuals and treated dignity, living human beings. 2. Work intrinsically valuable, enjoyable or meaningful in allowing personal expression and self-fulfillment. 3. Meaningful work , sense of personal identity and the self-esteem 4. Work, major instrumental good in life. 5. main source providing income needed to avoid economic dependence , 6. Pay, pace of work be in commensurate with the expertise required, acquired, utilized in persons. 7. Privacy of employee, including women, protected. 8. Security during job upon retirement, accepted, government jobs, public limited companies, corporate organizations. 9. Recognition non-work activities, leisure, paid holiday day, visit, dignitary, social service, developmental activities. 10. Hard work, productivity essential success industry. 11. Hard labor, undignified jobs, hazardous jobs, made less straining, dignified, safer. 12. Employee alienation, Absence of or inadequate 'recognition and reward system' and 'grievance redressal system', lack of transparency policy implementation, factions trade unions etc. 13. A different view of work ethics: Work is considered as a necessary evil. 14. Protestant Work Ethics, the financial success sign, favored by God. 15. Obtaining desired materials and services, achieving status and recognition others. 16. Exploitation and bargained pay should be discouraged. 17. Confidentiality of employer to be protected. 18. The quality of work life deserves to be improved. 19. Lead to ethical problems, affecting the work ethics.
3	**Explain integrity and honesty in ethics. (13 M) (NOV-DEC 2015) (NOV-DEC 2016)** BTL2 **Answer: Page No:190 - Mike W. Martin** **Answer Pg.no:0.9 to0.10 - V.Jayakumar** **Integrity: (6 M)**

	1. Integrity defined unity of thought, word, deed, open mindedness. 2. Capacity to communicate factual information, others make well-informed decisions. 3. Yields, person's 'peace of mind', hence add strength and consistency in character, decisions, and actions. 4. Paves way to one's success. 5. Enthuse people, not only execute job well, and achieve excellence in performance. 6. To own the responsibility, earn self-respect, recognition by doing job. 7. Moral integrity defined as a virtue **8.** Reflects consistency of one's attitudes, emotions, and conduct in relation to justified moral values**.** 9. I self-direction virtues **Honesty:(7 M)** Honesty is a virtue, and it is exhibited in two aspects namely, (1) **Truthfulness** i. Truthfulness faces the responsibilities upon telling truth. ii. One should keep one's word or promise. iii. By admitting one's mistake committed, it is easy to fix them. iv. Reliable engineering judgment, maintenance of truth, defending the truth, and communicating the truth, 'good' to others, (2) **Trustworthiness.** i) Trustworthiness, maintaining integrity and taking responsibility, personal performance. ii) right way to win, according to the laws or rules (legally and morally). iii. Build trust through reliability and authenticity. iv. Admit their own mistakes and confront unethical actions in others and take tough and principled stand, even if unpopular. v. Honesty is mirrored in many ways. Vi.People abides by law and lives by mutual trust. The common reflections are: (a) Beliefs (intellectual honesty). (b) Communication (writing and speech). (c) Decisions (ideas, discretion). (d) Actions (means, timing, place, and the goals). And (e) Intended and unintended results achieved.
4	**Explain the characteristics and importance of self confidence in ethics. (13M) (MAY-JUNE 2016)** BTL2 **Answer: Pg.no.0.29 - V.Jayakumar** **SELF-CONFIDENCE:** (3 M) 1. Certainty in one's own capabilities, values, and goals, self-confidence. 2. People usually positive thinking, flexible, willing to change. 3. Respect others so much as they respect themselves. 4. Self- confidence positive attitude, individual has some positive and realistic view, with respect to the situations, which one gets involved. 5. The people with self-confidence exhibit courage to get action and unshakable faith, abilities, whatever their positions. 6. Not influenced by threats, challenges and prepared to face the, natural or unexpected consequences. 7. The self- confidence person develops a sense of partnership, respect, and accountability,

	8. Helps organization, obtain maximum ideas, efforts, and guidelines from employees. **The people with self- confidence have the following characteristics: (4 M)** 1. A self-assured standing, 2. Willing to listen to learn from others and adopt (flexibility), 3. Frank to speak the truth, and 4. Respect others' efforts and give due credit. On the contrary, some leaders expose others when failure occurs, and own the credit when success comes. **The factors that shape self-confidence in a person are:(3 M)** 1. Heredity (attitudes of parents) and family environment (elders), 2. Friendship (influence of friends/colleagues), 3. Influence of superiors/role models, and 4. Training in the organization (e.g., training by Technical Evangelists at Infosys Technologies). **The following methodologies are effective in developing self-confidence in a person(3 M)** 1. Encouraging SWOT analysis. Evaluating their strength and weakness, anticipate and be prepared to face the results. 2. Training to evaluate risks and face them (self-acceptance). 3. Self-talk, conditioning mind for preparing self to act, without any doubt on his capabilities. 4. Make one accepts himself while striving for improvement. 5. Study, group discussion, on the history of leaders and innovators
5	**Discuss the importance time wasters. How can one manage time properly? (13 M)** BTL1 **Answer: Pg.no.0.24 to 0.25 - V.Jayakumar** **INTRODUCTION:(2 M)** Time is rare resource. Once spent, lost forever. Cannot be either stored or recovered. Time is the most perishable and most valuable resource too. Resource continuously spent, whether any decision or action is taken or not. History of great reformers and innovators, stressed, importance of time and valuing time. Time management: It is the rational way to ensure that our limited time is always used effectively. **Identifying time wasters: (3M)** Unscheduled and scheduled meetings Lack of adequate meetings Poor delegation Too much socializing Ineffective communication Lack of goal objectives Poorly organized supervision Poor use of telephone **Time management principle:(5M)** 1.clear objectives 2.prioritize tasks 3.stick to scheduled tasks

	4.Allow time to manage your time 5.The unexpected 6.Managing time wasters **An anecdote to highlight the 'value of time' is as follows:(3 M)** 1. To realize, value of one year, ask student who failed in the examinations; 2. To realize, value of one month, ask mother who delivered premature baby; 3. To realize, value of one week, ask editor of weekly; 4. To realize the value of one day, ask daily-wage laborer; 5. To realize, value of one hour, ask the lovers longing to meet; 6. To realize, value of one minute, ask person who missed train; 7. To realize value of one second, ask person who survived an accident; 8. To realize, value one Milli second, ask person who won the bronze medal in Olympics; 9. To realize value of one micro second, ask NASA team of scientists; 10. To realize value of one nano-second, ask a Hardware engineer!; If you have still not realized the value of time, wait; are you an Engineer?
6	**Discuss the concept of Caring, Sharing And Living Peacefully in detail. (13 M)** BTL2 **Answer: Page .no. 0.19 and 0.20 and 0.18 - V.Jayakumar** **Caring: (4 M)** 1. Caring, feeling for others. 2. A process which exhibits interest, support, the welfare of others with fairness, impartiality, justice all activities, employees, context of professional ethics. 3. Respect to feelings of others, respecting, preserving interests of others concerned. 4. Caring reflected in activities- friendship, membership in social clubs and professional societies, through various transactions in family, fraternity, community, country and in international councils. 5. In present day context, caring for environment, necessity for our survival. 6. Do not care environment, environment scare us. **SHARING: (4M)** 1. Primarily, caring influences 'sharing'. 2. Transfer of knowledge, experience, commodities, facilities with others. 3. Transfer genuine, legal, positive, voluntary, without expectation in return. 4. Proprietary information, not be shared with outsiders. 5. Process of sharing, experience, expertise, wisdom benefits reach more people faster. 6. Sharing voluntary, cannot be driven by force, 7. Motivated successfully through ethical principles. 8. sharing is 'charity' For humanity, 9. 'Sharing' a culture. 10. 'Happiness, wealth' multiplied 'crimes sufferings' reduced, by sharing. 11. Paves way for peace obviates militancy. 12. Philosophically, the sharing maximizes happiness for all human beings.

	13. Psychologies, fear, divide, and distrust between 'haves' 'have-nots' disappear. **LIVING PEACEFULLY:(5 M)** 1. To live peacefully, start install peace within. 2. Charity begins at home. 3. Then one can spread peace to family, organization where one works, and then to the world, including the environment. 4. Only who are at peace can spread peace. 5. You cannot gift an article which you do not possess. 6. Essence, oriental philosophy, one should not fight for peace. 7, It is oxymoron. War or peace, won by peace, and not by wars! One should adopt the following means to live peacefully, in the world: 1. Order in one's life 2. Pure thoughts in one's soul 3. Creativity in one's head. 4. Beauty in one's heart

	Explain commitment and empathy. (13 M) BTL2 **Answer: Pg.no.0.28 -V. Jayakumar** **Commitment:(5 M)** 1. Commitment means acceptance, responsibilities, duties, cooperation means help assistance. 2. By developing team commitment and cooperation in a work team assisting team to meet, goals and objectives. 3. Work teams that committed and cooperative more likely to achieve the goals the business has set. **Empathy: (8 M)** 1. Empathy capacity to understand feel another person, experiencing within other being's frame of reference, i.e., capacity, place oneself another's position. 2. Empathy seeing, eyes another, listening ears another feelings heart, another. 3. Many definitions, empathy encompass, broad range of emotional states. 4. Types of empathy cognitive empathy, emotional empathy, and somatic empathy. 5. Development human empathy, individual differences appear, ranging. no apparent empathic ability, empathy, harmful, self others 6. To well-balanced empathy, ability to distinguish between self other. **Daniel Goleman identified five key elements of empathy.** 1. Understanding Others. 2. Developing Others. 3. Having a Service Orientation. 4. Leveraging Diversity. 5. Political Awareness.
8	**Explain character and spirituality and their Importance in ethics.(13M)(MAY-JUNE 2016)** BTL2 **Answer: Pg .no.0.32 - V. Jayakumar** **INTRODUCTION: (4 M)** 1.Spirituality way of living emphasizes constant awareness recognition spiritual 2. Dimension, nature people, dynamic balance between material development, spiritual developments. 3. Great virtue of Indian philosophy for Indians. 4. Sometimes, spirituality includes faith, belief in supernatural power/ God,

	regarding worldly events. 5. Functions fertilizer for soil 'character' to blossom into values morals. **Spirituality in Workplace: (9 M)** Building spirituality in workplace: Spirituality promoted workplace by adhering to following activities: 1. Verbally respect individuals as humans recognize, values in all decisions actions. 2. Get to know people with whom you work know what important 3. Know goals, desires, and dreams too. 4. State your personal ethics your beliefs clearly. 5. Support causes outside business. 6. Encourage leaders to use value-based discretion, making decisions. 7. Demonstrate own self-knowledge spirituality in all actions. 8. Do unto others as you would have m do unto you.
9	**Briefly explain terms Values, Morals & Ethics. (13M)** BTL2 **Answer: Pg. no.0.4 - V. Jayakumar** **Morals: (4 M)** **Morals** principles on which one's judgments of right, wrong based. Morals refer to beliefs what not objectively right, but what considered right for situation What morally correct, not be objectively correct. Some moral principles : 1. Do not cheat 2. Be loyal 3. Be patient 4. Always tell truth 5. Be generous **Ethics: (6 M)** 1. Ethics principles of right conduct. . 2. main difference, morals more abstract, subjective, often personal or religion-based, 3. Ethics more practical conceived principles promoting fairness, social business interactions. Some ethical principles : 1. Truthfulness 2. Honesty 3. Loyalty 4. Respect 5. Fairness 6. Integrity **Values: (3 M)** **Values —**things have an intrinsic worth in usefulness or importance to possessor, or principles, standards, qualities considered worthwhile, desirable. 1. Tend to think of a value as something good, virtually all values morally relative neutral, really qualified by asking, –How it good? –Good to whom? 2. –good sometimes just a matter of opinion, taste, driven by culture, religion, habit, circumstance, environment, etc.

10	**What is integrity? Explain number of accounts viewed under integrity. What are the salient features of courage? (13 M)** BTL2 **Answer: Pg.no.0.10 - V.Jayakumar** **MEANING: (2M)** 1. Integrity elementary value for profession. 2. Important for all who exhibit strong moral ethical principles. 3. Deals exhibiting fairness honesty, all professional, personal relations. 4. Personal choice which uncompromising under any kind of circumstances. **Number of accounts viewed under integrity. (7M)** **1. Integrity as self-integration** • Establishes a formal relation to self people integrate different facets of ir personality to an intact whole. • Mainly a matter of keeping oneself totally intact uncorrupted. **2. Integrity as identity** • Commitment, one makes, oneself, people, relations, institutions, traditions culture etc. **3. Integrity as sting for something** • Self-integration identity sees integrity, matter of personal choice. • Person, high integrity, consistent endorsements, takes something within community. • Integrity considered, proper regard, role community process deliberation over valuable worth doing. **4. Integrity as purpose** • Places moral checks on kinds, commitments person of integrity must honor. • Integrity, morally correct despite, substantial moral disagreement, some issues with section of society. **5. Integrity as-Individual, Professional Institutional** • Integrity forms building block, ethical conduct competency. • Three different levels essential for an individual's professional survival. 1.Personal integrity Accountability for personal actions conducting personal relationships fairly honestly. 2.Professional integrity Professional duties obligations complete honesty in conformity, professional code of ethics. 3.Institutional integrity • Wider concept driven by mission--vision statements of an organization, established code of conduct procedures. • Ethical conduct throughout organization through personal example, management practices ethical training. **The salient features of courage:(4 M)** **a)**Moral courage b)Physical courage
	PART * C
1	**Distinguish values from ethics. (15M)** BTL4 **Answer: Pg.no.0.11 - V.Jayakumar** **Values: (2 M)**

- Values can be defined as those things that are important to or valued by someone.
- That someone can be an individual or, collectively, an organization.
- One place where values are important is in relation to vision.
- One of the imperatives for organizational vision is that it must be based on and consistent with the organization's core values.

Ethics: (3 M)

At its simplest, ethics is a system of moral principles. They affect how people make decisions and lead their lives.

Ethics is concerned with what is good for individuals and society and is also described as moral philosophy.

The term is derived from the Greek word *ethos* which can mean custom, habit, character or disposition.

Ethics covers the following dilemmas:

- How to live a good life
- Our rights and responsibilities
- The language of right and wrong
- Moral decisions - what is good and bad?

Explanation: (10 M)

Comparison Chart:

BASIC COMPARISON	ETHICS	VALUES
MEANING	Ethics refers to the guidelines for conduct, that address question about morality.	Value is defined as the principles ideals that helps them in making judgment of what is more importa
WHAT ARE THEY?	System of moral principles.	Stimuli for thinking.
CONSISTENCY	Uniform	Differs from person to person
TELLS	What is morally correct or incorrect, in the given situation?	What we want to do or achieve.
DETERMINES	Extent of rightness or wrongness of our options.	Level of importance.
WHAT IT DOES	Constrains	Motivates

2	**Briefly explain the importance of Yoga and meditation for successful life. (15M) (NOV-DEC 2015) (NOV-DEC 2016) (Nov/Dec2013)** BTL2

Answer: Refer notes

Yoga:(2M)

Yoga is a type of exercise in which you move your body into various positions in order to become more fit or flexible, to improve your breathing, and to relax your mind.

Yogic exercise recharge body with cosmic energy facilitates: (3M)

1. Attainment of perfect equilibrium harmony
2. Promotes self- healing.
3. Removes negative blocks from mind toxins from body
4. Enhances personal power
5. Increases self-awareness
6. Helps in attention, focus concentration, especially important for children
7. Reduces stress tension physical body ,activating nerve system

Importance of Yoga (4M)

1. Yoga for all-round fitness
2. Yoga for weight loss
3. Yoga for stress relief
4. Yoga for inner peace
5. Yoga to improve immunity
6. Yoga to live with greater awareness
7. Yoga for better relationships
8. Yoga to increase energy
9. Yoga for better flexibility & posture
10. Yoga to improve intuition

Meditation:(2M)

Meditation is a precise technique for resting the mind and attaining a state of consciousness that is totally different from the normal waking state. It is the means for fathoming all the levels of ourselves and finally experiencing the centre of consciousness within.

Importance of Meditation: **(4 M)**

- Focused attention
- Relaxed breathing
- Gives a sense of calm
- Gaining new perspective on stressful situation
- Increasing self awareness
- Reducing negative emotions

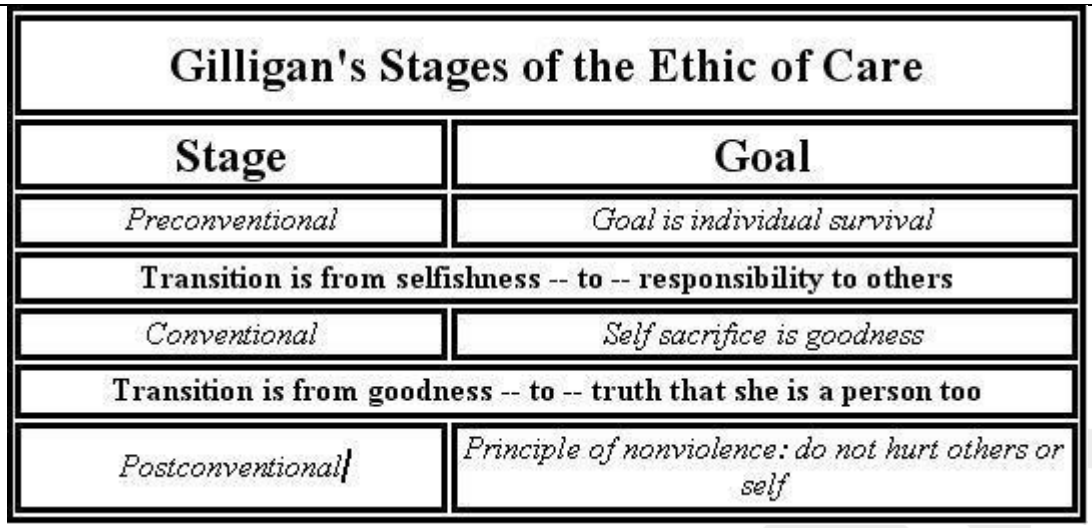
3	**Explain the need of stress management in detail. (15M) (April / May2017) (NOV-DEC 2015)** BTL2 **Answer: Refer Notes**. **INTRODUCTION: (3 M)** i. We all react differently to stress. ii. Based on available resources skills, you decide whether a situation stressful to you. iii. might become aggressive take your stress out on your loved ones or colleagues whilstors hold it in rare use escape techniques such as eating disorders or substance abuse, which ultimately more destructive. **Cause of stress:** a. constantly irritable or having sleep problems b. Snappy short fused c. Feeling anxious or depressed d. Excessively eating, drinking or smoking e. High, cholesterol, high blood pressure, eczema or skin problem f. Struggle with concentration, feeling unmotivated or insecure g. insecure feelings about money, your employment or your relationship **NEED FOR STRESS MANAGEMENT:(12 M)** **1. Set daily goals.** It important to set goals for before going to work next day. Setting specific daily goals for business, help stay focused, saving time money long run. **2. Delegate.** Delegate your business family responsibilities. If your job, delegate some of your responsibilities to qualified employees. **3. Prioritize your tasks.** Determine what needs done right away do those particular task order importance. That way, you won't be constantly worrying about completing se vital projects can relax after complete. **4. Communicate.** Don't waste your time assuming that certain people will do what y need to do. Talk to your co-workers your family so that everybody on same page. Can not only save you a lot of time but also will reduce your stress level. **5. Prepare for unexpected events.** Sometimes certain events may happen that might take everyone by surprise. Be flexible when unexpected events, deal immediately. **6. Don't procrastinate.** Do not put things off when you can do m today. An entrepreneur, important, staff, family members' complete tasks in a timely manner. **7. Reduce any potential conflicts.** When a potential problem starts to develop with workers or family members, try to find a solution immediately. Do not let potential conflicts drag on from one week to next. Use your problem-solving skills to prevent any arguments. **8. Get help if you need it.**

	Sometimes a person might need to speak to a counselor or take some educational classes in time management.

	UNIT II ENGINEERING ETHICS
	Senses of "Engineering Ethics" – Variety of moral issues – Types of inquiry – Moral dilemmas – Moral Autonomy – Kohlberg's theory – Gilligan's theory – Consensus and Controversy – Models of professional roles – Theories about right action – Self-interest – Customs and Religion – Uses of Ethical Theories.
	PART * A
1	**Define moral Dilemma. (MAY/JUNE 2012)** BTL2 Dilemmas are certain kind of situations in which a difficult choice has to be made. Moral dilemmas can also be called moral problems. Moral Dilemmas have two or more folding's- moral obligations, duties, rights, goods, or ideals come disagreement with each other.
2	**What are the chief characteristics of a profession? (MAY/JUNE 2012)** BTL2 • It renders an essential social service. • It demands continuous in service training of its members • It involves a code of ethics. • It sets up its own professional organization. • It assures its members a professional career. • It has a truth and loyalty. • It has a transparency of work. • It gives instantaneous results.
3	**Write a note on significance of engineering ethics. (MAY/JUNE 2011)** BTL3 An engineer should have the ability and judgement to refine one's behaviours, decisions and actions in performing the duty to the family, organization and to the society. An engineer needs to be a free thinker. he needs to be an intellectual who has the proficiency in recognizing moral problems in engineering, comprehend and assess those views from different viewpoints
4	**What is engineering ethics? (MAY/JUNE 2011, MAY/JUNE 2014)** BTL2 Study of the moral issues and decisions confronting individuals and organizations engaged in engineering / profession. Study of related questions about the moral ideals, character, policies and relationships of people and corporations involved in technological activity. Moral standards /values and system of morals.
5	**What is meant by normative inquiry? (MAY/JUNE 2011)** BTL2 Engineering ethics involves normative inquiry in order to aim at identifying and justifying the morally desirable norms or standards that ought to guide individuals or groups. Normative questions include what ought to be? And what is good?
6	**What do you mean by ethical pluralism?(APRIL/MAY 2010)** BTL2 Ethical pluralism is the view that there may be alternative moral perspectives that are reasonable, but no one of which must be accepted completely by all rational and morally concerned persons.
7	**Differentiate Moral and Ethics. (MAY/JUNE 2010)** BTL4 **Moral:** • Refers only to personal behaviour. • Refers to any aspect of human action. • Social conventions about right or wrong conduct**.**

	Ethics: Involves defining, analyzing, evaluating and resolving moral problems and Developing moral criteria to guide human behaviour. Critical reflection on what one does and why one does it. Refers only to professional behaviour.
8	**Write any three uses of ethical theories. (NOV/DEC2010, MAY/JUNE 2014)** BTL3 Ethical theories are very useful in understanding and resolving moral dilemmas. In estimating the professional obligations and ideals. Determine to what extent, the obligations can be exercised in a given situation.
9	**What are the types of Theories about Morality/ Right action? (MAY/JUNE 2009) (NOV-DEC2018)** BTL2 Virtue ethics – Virtues and vices Utilitarianism – Most good for the most people Duty ethics – Duties to respect people Rights ethics – Human rights
10	**State Ethical Egoism. (MAY/JUNE 2009)** BTL1 It deals with self-interest. Each person is the best judge of their own self-interest and is responsible for maximizing their own interest. Egoism preaches selfishness but morality should encourage love, compassion etc.
11	**Differentiate Ethical Relativism and Ethical Egoism. (MAY/JUNE2008)** BTL4 Ethical egoism – the view that right action consist in producing one's own good. Ethical relativism – the view that right action is merely what the law and customs of one's society require**.**
12	**What is moral integrity? (MAY/JUNE2008)** BTL2 Moral integrity is the strength of character on the basis of moral concern and moral values. Integrity is the bridge that links the responsibilities between personal life and professional carrier.
13	**Differentiate profession and professionalism. (NOV/DEC 2008)** BTL4 Profession is a job through which someone makes living. Professionalism covers comprehensively all areas of practice of a particular profession. It requires skills and responsibilities involved in engineering profession.
14	**Give the importance of Lawrence Kohlberg's and Carol Gilligan's theory. (NOV/DEC2008)** BTL1 Kohlberg gives greater emphasis to recognizing rights and abstract universal rules. Gilligan Stresses the importance of maintaining personal relationships based on mutual caring.
15	**What is consensus and controversy?** BTL2 Consensus means agreement and controversy means disagreement. Both plays the vital roles while considering moral autonomy.
16	**What is the relationship between moral autonomy and authority?** BTL2 Moral' autonomy is exercised on the basis of moral concern for other people and recognition of good moral reasons. Authority provides the frame work in which learning can takes place in class room/work place.
17	**What are the concepts of pre-conventional & conventional level in Gilligan's theory?** Carol Gilligan recast the theory of Kohlberg as follows. BTL2 Pre conventional level: Desire to derive benefits for oneself. Right conduct is viewed in a selfish manner as solely what is good for oneself. Conventional level: Here the basic motive is willingness to sacrifice one's own interests and a strong desire to hurt other's interests. Mostly women are always willing to give up their personal interests in order to serve the needs of others.
18	**Define Ethics. Mention some universally accepted ethical standards. (NOV/DEC 13)** BTL2 "Ethics" as the "discipline dealing with what is good and bad and with moral duty and obligation," "a set of moral principles or value" or "a theory or system of moral values." Ethics assists individuals in deciding when an act is moral or immoral, right or wrong. Ethics can be grounded in natural law, religious tenets,

	parental and family influence, educational experiences, life experiences, and cultural and societal expectations. Ethical Standard such as Focus on ethics, Corporate culture, Managerial
19	**Define Professionalism. (APRIL/MAY 2015)** BTL2 Professionalism means behaving in an ethical manner while assuming and fulfilling your rightful responsibilities in every situation every time, without fail. To get a bit more granular, one can say that it means, in part, conducting your affairs in such a way as to engender trust and confidence in every aspect of your work.
20	**Define Moral Autonomy (NOV/DEC2014/2018)** BTL2 Moral autonomy, usually traced back to Kant, is the capacity to deliberate and to give oneself the moral law, rather than merely heeding the injunctions of others. Personal autonomy is the capacity to decide for one self and pursue a course of action in one's life, often regardless of any particular moral content.
	PART * B
1	**What are the stages of moral development according to Gilligan? Discuss it.(13M)(Nov/Dec2006) (Nov/Dec2007) (April/ May2011) (Nov/Dec2012) (Nov/Dec2013)** BTL2 **Answer Page.no:1.17 V.Jayakumar** **INTRODUCTION: (2 M)** • **Carol Gilligan Moral Development Theory Explained** Carol Gilligan moral development theory used, approach to reasoning. Women tended, score lower, scales of morality compared to men. Not agreeing, idea, women morally inferior to men Began, process of interviewing women, make difficult decisions in lives. Process develop a moral development theory, closely associated, women instead, men. **The Three Stages of Gilligan's Moral Development Theory: (6 M)** Gilligan produced, theory, three stages of moral development. • **The Pre-conventional Stage:** Goal of a woman, to survive. Focused on individuality Making sure basic needs been met. Priority to meet others needs. • **The Conventional Stage:** A woman recognizes, self-sacrifice, source "goodness" in life. Finds moral satisfaction, by helping other people Focusing on helping others to survive best way possible. • **The Post-conventional Stage:** "Ends no longer justify the means" to have needs met. A principle of non-violence, applies to every decision. Not wish to hurt or hurt others, looking alternative methods to meet needs. Diagram: (2 M)

	 **Gilligan suggests two transitions that occur during the stages. (2 M)** **The first transition:** • Occurs between the pre-conventional and conventional stages • Moves a woman's moral ethics from selfish to shares a responsibility to care others. **The second transition:** • Occurs between the conventional and post-conventional stages • Moves a woman being focused on "good" to being focused on "truth." • Looking, ways to survive for herself and for others • Begins, look, options fueled, need to stay true to certain moral constants.
2	**Explain the uses of ethical theories. (13M) (Nov/Dec2006)** BTL2 **Answer Page No.:60-66 Mike W. Martin** **The uses of ethical theories.: (13 M)** • Identifying moral considerations, reasons to constitute a dilemma. • Precise sense of information, relevant to solving moral development. • Provide guidance in solving moral problems. • moral ramifications of alternative courses action • Providing systematic framework of comparing alternatives. • Discussing moral issues with colleagues. • By providing frame works development of moral arguments • It strengthens ability to reach balanced and insightful judgments. • Justifying professional obligations and ideas. • 10. Relating ordinary and professional morality.
3	**Explain in detail: (13 M) (Nov/Dec2007)** BTL2 **1. Professional responsibility. Answer Page. no. 2.3 V. Jayakumar** **2. Self- respect. Answer: Page. no. 2.5 & 2.6 V. Jayakumar** **3. Utilitarianism. Answer Page No. 55 Mike W. Martin** **Professional responsibility** : **(6 M)** • The **duties** of attorneys to act in a professional manner • Obey the law, avoid conflicts of interest • Put the interests of clients ahead of their own interests. • Being morally responsible as a professional. **Most basic and comprehensive professional virtue.** **A wide variety of more specific virtues grouped as follows:** • **SELF DIRECTION VIRTUES:**

Fundamental virtues in exercising moral autonomy and responsibility.
e.g. self understanding, humility and good moral judgment

- **PUBLIC SPIRITED VIRTUES:**

Focusing on good of clients and public affected by engineers‟ work

- **TEAMWORK VIRTUES:**

Enables professionals to work successfully with others.
E.g. collegiality, cooperativeness, the ability to communicate

- **PROFICIENCY VIRTUES:**

Mastery of one's craft that characterize good engineering practice
e.g. competence, diligence, creativity

- **MORAL INTEGRITY**

The unity of character on the basis of moral concern
Consistency among our attitudes in relation to justified moral values.

SELF-RESPECT (3 M)

- Valuing oneself in morally appropriate ways.
- Integral to finding meaning in one's life and work
- A pre-requisite for pursuing moral ideals and virtues.
- Self-respect is a moral concept of properly valuing oneself
- Self-esteem is a concept of positive attitude towards oneself.

Self-respect takes two forms.

- Recognition self-respect is properly valuing oneself
  One's inherent moral worth, every other human being has.
- Appraisal self-respect is properly valuing ourselves
  How well we meet moral standards, our personal ideals.

- **Utilitarianism: (4 M)**

Utilitarianism is a normative ethical theory

Places the locus of right and wrong solely on the outcomes

There are two main types of Utilitarianism. They are:

- **Act Utilitarianism**

Act Utilitarianism states that "A particular action is right if it is likely to produce the higher level of good for the most people in a given situation, compared to alternative choices that might be made."

- **Rule Utilitarianism**

The Rule Utilitarianism states that "Right actions are those required by rules that produce the higher level of good for the most people."

Formulation of Ethical Theories

- The concepts of the theory formulated must be coherent.
- The tenets of the theory should never contradict the other.
- The theory should never be defended upon false information.
- Guide in specific situations comprehending all aspects possible.

	• Compatible with individual's moral convictions in any situation.
4	**Explain Kohlber's theory in detail. (13 M) (MAY/JUNE2011) (NOV-DEC2018)** BTL2 **Answer Page. no. 1.15 V. Jayakumar** **Kohlberg's Stages of Moral Development (6 M)** **Level 1 - Pre-conventional morality (7 M)** • We don't have a personal code of morality. • Our moral code is shaped by the standards of adults • Stage 1. Obedience and Punishment Orientation. • The child/individual good in order to avoid being punished. • Stage 2. Individualism and Exchange. • Different individuals have different viewpoints. **Level 2 - Conventional morality** • To internalize the moral standards of valued adult role models. • Stage 3. Good Interpersonal Relationships. • The child, good in order to be seen as good person by others. • Stage 4. Maintaining the Social Order. • The child/individual becomes aware of wider rules of society. **Level 3 - Post-conventional morality** • Individual judgment is based on self-chosen principles. • Moral reasoning is based on individual rights and justice. • Stage 5. Social Contract and Individual Rights. • The child/individual aware of rules/laws, exist for the good of greatest number. • Stage 6. Universal Principles. • Develop own set of moral guidelines, may or may not fit law.
5	**Discuss the scopes of engineering ethics. (13 M)(April/ May2008) (April/ May2011)** BTL2 **Answer Page. no. 2 Mike W. Martin** **INTRODUCTION: (2 M)** • **Engineering Ethics** Moral issues, decisions confronting individuals and organizations engaged in **engineering**. **EXPLANATION: (11 M)** **Moral reasoning and ethical theories:** • By "morality," meant the standards of rightness and goodness • "Ethics" means those moral standards that appropriate to particular occupations **Engineers As Social Experimentation:** • In developing a product, an engineer learns through experimentation. • A trial and error method is the mostly used one to obtain results, **Engineers responsibility for safety:** • To maintain the safety of human beings. • To procure their rights of consent. • To warn them about the probable safety hazards. **Respect to employees and right to engineer:** • A safe and healthful workplace • To ask your employer to correct dangerous conditions. • To file a complaint about workplace hazards **GLOBAL ISSUES:** • Increases through trade, investment, transfer of technology, exchange of ideas, culture.

	Engineers as Managers • An Engineer is responsible in promoting ethics in an organization, • Framing organizational policies, responsibilities and obligations.
6	**Explain the different ethical theories right action, self-interest, duty ethics. (13M) (April / May2007)** BTL2 **Answer Page No. 60-72 Mike W. Martin** **Duty ethics theory: (3 M)** • Consequences of performance of one's duties. • Being honest, not cause suffering of other • Being fair to others including the meek and week • Being grateful, keeping Promises etc. **The RIGHTS EHICS:(4 M)** • The right to access the truth • The right of privacy • The right not to be injured • The right to what is agreed **Self-Interest Ethics: (3 M)** • Right action consists in seeking self-fulfilment. • Self to be realized, defined by caring relationships with individuals and society. • Ethical egoism, right action consists in always promoting what is good for oneself. **DIAGRAM: (3 M)**
7	**Discuss the different models of professional roles.(13M)(May/June 2009) (NOV-DEC2018)** BTL2 **Answer Page. no. 1.23 V. Jayakumar** **EXPLANATION: (13 M)** • **SAVIOR:** Redeem society from poverty, inefficiency Waste and the drudgery of manual labour. • **GUARDIAN:** Directions in which, pace at which, technology should develop. • **BUREAUCRATIC SERVANT:** Loyal organization person uses special skills to solve problems. • **SOCIAL SERVANT:**

	Co-Operation with management, task of receiving society's directives, satisfying society's desires • **SOCIAL ENABLER AND CATALYST:** Vital role beyond mere compliance with orders. Management and society understand, own needs, to make informed decisions. • **GAME PLAYER:** Neither servants nor masters of anyone. Economic game rules that happen to be in effect at a given time.
8	**Explain the need of tolerance for different customs and ethical relativism in adverse society with suitable example. (13 M) (April /MAY 2014)** BTL2 **Answer Page No:2.16 V.Jayakumar** **Customs and Ethical Relativism: (6 M)** • There may be alternative moral attitudes that are reasonable. • Ethical pluralism allows in deciding how we should act. • Moral values are many, varied and flexible. • Reasonable persons always have reasonable disagreement on moral issues • Ethical relativism says actions morally right when they approved by law, custom • Ethical relativism tries to reduce moral values to laws. **Reasons for accepting ethical relativism: (7 M)** • The laws and customs seem to be definite, real and clear – cut. Help to reduce the endless disputes about right and wrong. Laws seem to be an objective way to approach values. • It believes values are subjective at cultural level. The moral standards varied from one culture to another. Morality encourages virtue of tolerance of difference among societies. • The moral renationalise or moral contextualise. Making simple and absolute rules are impossible in this way. Customs, laws considered as morally important factors for making judgments.
9	**Explain the vital role of consensus and controversy while considering moral autonomy in Engineering ethics. (13 M) (Nov/Dec2012)** BTL2 **Answer Pg. no. 1.18 V. Jayakumar** **CONSENSUS AND CONTROVERSY** **Models of professional roles: (6 M)** • **SAVIOR:** Redeem society from poverty, inefficiency Waste and the drudgery of manual labour. • **GUARDIAN:** Directions in which, pace at which, technology should develop. • **BUREAUCRATIC SERVANT:** Loyal organization person uses special skills to solve problems. • **SOCIAL SERVANT:** Co-Operation with management, task of receiving society's directives, satisfying society's desires • **SOCIAL ENABLER AND CATALYST:** Vital role beyond mere compliance with orders. Management and society understand, own needs, to make informed decisions. • **GAME PLAYER:** Neither servants nor masters of anyone. Economic game rules that happen to be in effect at a given time.

	Consensus and Controversy (4 M) • Literally, consensus means _agreement', controversy means _disagreement'. • Individual exercise moral autonomy, to attain same results as other people obtain • This kind of controversies i.e., disagreements are inevitable. • Exercising moral autonomy is not as precise, clear-cut as arithmetic • The moral disagreements are natural and common. • Promoting tolerance in practical applications of moral autonomy by engineers. **Relationship between autonomy and authority (3 M)** • Moral autonomy and respect for authority compatible with each other. • Exercising moral autonomy based on moral concern for other people • Exercising moral autonomy recognition of good moral reasons. • Also moral autonomy emphasizes the capabilities and responsibilities of people. • Authority provides framework, through which learning attitudes are encouraged. • Conflicts will arise between individuals need for autonomy, consensus about authority. • This situation can be rescued by having open and frank
10	**State Meaning of moral dilemma. Describe the types and few steps in confronting Moral Dilemma in the life (13 M) (April/ May2007)** BTL2 **Answer Pg. no. 32 Mike W. Martin** **Definition: (2 M)** A moral dilemma is defined as any situation in which the person making the decision experiences a conflict between the moral rightness of a decision and the quality of the results it produces. Many times, these dilemmas involve a morally wrong decision that produces a desirable result, or vice versa. **The following three categories of complex and gloomy moral situations: (8 M)** • **Vagueness** The condition where the doubt lies in whether the action refers to good or bad. • **Conflicting reasons** Fixing the priorities depends upon the knowledge and the moral values one has. The reason why the particular choice makes sense. • **Disagreement** When two or more solutions and none among them is mandatory The final solution selected should be best most probable conditions. • **Steps in Facing Moral Dilemmas (3 M)** Whenever a person is faced with a moral dilemma, the issue is to be solved with a stepwise approach as this will generate a better output. **The step of identification involves the following −** • The issue has to be thoroughly understood. • The duties, responsibilities of persons involved to be clearly known. • The moral factors related to the issue are to be understood. • The conflicting responsibilities
	PART * C
1	**Discuss the moral problems faced by an Indian common man. (15 M) (April / May2008)** BTL2 **Answer Page. no: 5 Mike W. Martin 3rd Edition Refer notes** **Morality: (3 M)** Morality is the human attempt to define what is right and wrong about our actions and thoughts, and what is good and bad about our being that we are. *"Moral issue is a working definition of an issue of moral concern is presented as any issue with the potential to help or harm anyone, including oneself."*

	Types of Moral Issues (5 M) There are mainly two types of Moral issues. They are – • **Micro-ethics** Problems that occur on a daily basis in field of engineering, its practice by engineers. • **Macro-ethics** This approach deals with social problems which are unknown. Problems may unexpectedly face the heat at both regional, national levels. **Examples: (3 M)** 1. Animal Welfare - Is it okay to eat meat or dairy? **Moral problems faced by an Indian common man: (4 M)** • Discrimination based on caste, creed and colour. • Reservation in education and employment field enjoyed by "backward class" for 3 generations and still continue to use. • To meet basic amenities-food, clothing and shelter. • Garbage collection and disposal • Traffic congestion in urban areas • Farmers not getting support prices for crops • Corruption
2	**Name and explain the various types of Ethical inquiries available. Analyze in detail the *Self –Interest and Ethical Egoism* (15M)**BTL4 **Answer Page. no. 72 Mike W. Martin(*Self –Interest and Ethical Egoism)*** **Answer refer notes.** **Types of Inquiries (8 M)** **Normative inquiries** **Conceptual inquiries** **Factual or descriptive inquiries** • **Normative Inquiries** The description that describes what one ought to do under a specific circumstance. • **Conceptual Inquiries** The description of meaning of concepts, principles and issues related to engineering ethics. • **Factual and Descriptive Inquiries** The descriptive inquiry help to provide the facts for understanding Finding solutions to the value based issues. **Self-interest: (4 M)** It refers to the goodness of oneself in the long run. • The ethical theories recognize the importance of self-respect. • Utilitarian considers one's own good as well as the good of others. • Duty ethicists stress duties to us and for won well-being. • Ethicists of rights emphasize our rights to pursue our own good. • Virtue ethicists accent the importance of self – respect.

	• Pursuit of self – interest must be balanced • Kept under control by moral responsibilities to other people. **Ethical Egoism (3 M)** • It tries to reduce morality to the pursuit of self - interest. • The main duty of us is to maximize our own good. • Make a differentiation between narrower and wider forms of self-interest • Ethical Egoists try to protect their positions by arguing • Pursue their self – interest in a very cautious manner to value, interest rationally on facts. • Not a persuasive or probable theory to state what is morality • It is only a convinced rejection of morality.
3.	**Explain the theory of human right ethics and its classification. (15 M) (Nov/Dec 15)** BTL2 **Answer Page. no. 55 to 66 Mike W. Martin** **THEORIES ABOUT RIGHT ACTION:** These theories are essential for cause of right action and morality. They are: • **"Golden mean"** ethics **(3 M)** The best solution is achieved through reason and logic A compromise or "golden mean" between extremes of excess, deficiency. **Problem:** Variability from one person to another in their powers of reasoning The difficulty in applying the theory to ethical problems**.** • **"Rights –** based" ethics **(4 M)** Every person is free and equal Has the right to life, health, liberty and possessions **Problem:** One person's right may be in conflict with another's rights. • **"Duty –** based" ethics **(4 M)** Each person has a duty to follow a course of action **Problem:** Universal application of a rule can be harmful. • **"Utilitarian"** ethics **(4 M)** The best choice, which produces maximum benefit for greatest number of people **Problem:** Qualification of the benefits can be difficult.

	UNIT –III **ENGINEERING AS SOCIAL EXPERIMENTATION**
	Engineering as Experimentation – Engineers as responsible Experimenters – Codes of Ethics – A Balanced Outlook
1	**Write some of the pros and cons of industrial standardization. (MAY/JUNE 2012) (NOV-DEC2018)**BTL2 **Advantages of Standards:** • Reducing costs • Increasing productivity • Reducing unnecessary variety • Ensuring inter changeability • Minimizing waste • Ensuring safety • Quality assurance **Disadvantages of standards:** • The implementation of standard removes the creative element of the program • Standards force people to change their methods • Standards reduce productivity by forcing unnecessary actions • Standards do not prevent bugs.
2	**List out the limitations of ethical code. (MAY/JUNE 2011)(NOV/DEC 2014)** BTL1 • Some issues cannot be handled in the context of a code. • There are some difficulties with enforcing the code, or at least the public may believe that enforcement committees are not tough enough on their peers. • There is often no way to bring the interests of the client, patient, or research participant systematically into the code-construction process. • There are parallel forums in which the issues in the code may be addressed, with the results sometimes at odds with the findings of the code (for example, in the courts).
3	**Define ethical accountability. (MAY/JUNE 2011)** BTL2 The inherent tendency of accepting moral responsibility for the actions of an individual and also the spontaneous willingness to subject him to the moral scrutiny in an open-minded manner is called ethical accountability.
4	**Name the aerospace ace experts and scientists who were associated with the Launching of challenger. (MAY/JUNE 2010)** BTL2

	Allan McDonald of Morton-Thiokol at Cape Kenned y, Arnold Thomson and Roger Bois jolywho were the seal experts at Morton-Thiokol a n d engineering managers, Bob Lund and Joe Kil minster were the experts associated with the launching of challenger space program.
5	**Name some of the important code of ethics published by engineering societies. (MAY/JUNE 2010)** BTL2 National society of professional Engineers. Board of Ethical review. NSPE opinion of the Board of ethical review. American Association of Engineering societies (AAES). Institute of Electrical and Electronics Engineers (IEEE).
6	**What are the problems with the law in engineering?(NOV/DEC 2010)** BTL2 The numerous legal considerations that must be taken into account by engineers, considerations that are typically outside of the traditional knowledge base and experience of an engineer. Patents and the process of obtaining one; maintenance of licensing and certification; and having a firm understanding of codes and standards are just some of the many issues facing engineers in their career path.
7	**How engineering could be regarded as preventive technology? (MAY/JUNE 2009)** BTL2 As per the familiar proverb that "prevention is better than cure", the ultimate process of solving the scientific-based problems is not by curing alone, but effectively by the preventive measures. Such type of defensive measures to prevent scientific ills is called preventive technology.
8	**What are the general features of morally responsible engineers?(MAY/JUNE 2009)** BTL2 • Conscientiousness. • Comprehensive perspective. • Autonomy. • Accountability.
9	**Write some of the specific role of informed consent in engineering experimentatio**n. (BTL2) Informed consent is the vital concept to interact engineers with public society. It reflects the respects for the fundamental rights of minority people involved in the experimental procedures.

	It enables both the public and clients to be aware of the practical risks and benefits of that experimentation.
10	**Write the differentiation between engineering and standard experiments.** (BTL2) Engineering experimentation involves human subjects as control groups, Unlike in the standard experimentation .The process of obtaining the informed consent from the human-engineering experimentation. Unlike in the scientific experiments, new knowledge is not gained in engineering experiment.
11	**Differentiate scientific experiments and engineering projects** (BTL4) Scientific experiments are conducted to gain new knowledge, while ―engineering projects are experiments that are not necessarily designed to produce very much knowledge.
12	**How Titanic tragedy be brought under engineering as social experimentation?** (BTL2) Failure in the far-sighted approach of not providing enough number of lifeboat sand non-availability of proper safe exits handled to the sinking of titanic ship that caused the death toll of 1522 persons on b o a r d . These in designing a r e the reasons for bringing titanic tragedy under engineering as social experimentation
13	**Write down some of the uncertainties occur in the model designs.(APR-MAY2017)** (BTL3) Model used for the design calculations. Exact characteristics of the materials purchased. Constancies of materials used for processing and fabrication. Nature of the pressure, the finished product will encounter.
14	**Give short notes on engineering as experimentation. (MAY/JUNE2014) (APR/MAY 2015)(NOV/DEC 2014)** (BTL1) Experimentation (Preliminary tests or Simulations) plays a vital role in the design of a product or process.In all stages of converting a new engineering concept into a design likes, first rough cut design,Usage of different types of materials and processes, detailed design, Further stages of work design.
15	**State the importance of Ethics codes. (MAY/JUNE2014)** (BTL1) Engineers shall uphold and advance the integrity, honour, and dignity of the engineering Profession by: •Using their knowledge and skill for the enhancement of the human race; •Being honest and impartial and serving with fidelity the public, their employers, and clients. •Striving to increase the competence and prestige of the engineering profession.

	•Supporting the professional and technical societies of their discipline
16	**List the conditions required to define a valid Consent.** (BTL1) It must be voluntary and informed, and the person consenting must have the capacity to make the decision. Capacity – the person must be capable of giving consent, which means they understand the information given to them and they can use it to make an informed decision.
17	**Give some universally accepted ethical principles.** (BTL2) • Honesty • Commitment • Empathy • respect for the dignity • Competent Caring for the Well-Being of Persons and Peoples • Integrity • Professional And Scientific Responsibilities To Society
18	**List out the advantages of industrial standards. (APR/MAY 2015)** (BTL1) • Increased marketability • Reduced operational expenses • Better management control • Increased customer satisfaction • Improved internal communication
19	**what do you understand by balanced outlook on Law?** (BTL2) A balanced outlook on laws stresses the necessity of laws and regulations and their limitations in directing engineering practice. In order to live, work and play together in harmony as a society, there must be a balance between individual needs and desires against collective needs and desires. Only ethical conduct can provide such a balance. This ethical conduct can be applied only with the help of laws. Laws are important as the people are not fully responsible and because of the competitive nature of the free enterprise system which does not encourage moral initiative.
20	**Define Whistle Blowing.** (BTL2) This is an act by an employee informing the public or higher management of unethical or illegal behavior by an employee or supervisor. Engineers shall not attempt to injure, maliciously or falsely, directly or indirectly, the professional reputation, prospects, practice, or employment of other engineers.
21	**List the advantages of code of ethics.(NOV-DEC2018) BTL1** • Guide employees in situations where the ethical course of action is not immediately obvious.

	• A code can help create a climate of integrity and excellence. • Help the company communicate its expectations to the staff to suppliers, vendors and customers. • Minimize subjective and inconsistent management standards. • Help a company remain in compliance with complex government regulations. • Build public trust and enhance business reputations. • Offer protection in preempting or defending against lawsuits. • Enhance morale, employee pride, loyalty and the recruiting of outstanding employees. • Help promote constructive social change by raising awareness of the community's needs and encouraging employees and other stakeholders to help. • Promote market efficiency – especially in areas where laws are weak or inefficient – by rewarding the best and most ethical producers of goods and services.
21	**How does the law facilitate the ethics in engineering?(APR-MAY 2017)** BTL2 Engineering ethics is the field of system of moral principles that apply to the practice of engineering. The field examines and sets the obligations by engineers to society, to their clients, and to the profession. As a scholarly discipline, it is closely related to subjects such as the philosophy of science, the philosophy of engineering, and the ethics of technology.
	PART * B
1	**i. Assess how Engineering societies can promote ethics.** **ii. Evaluate the General responsibilities of moral engineers.(13M)** (BTL5) **Answer refer notes.** **Engineering societies and promoting ethics.(4 M)** • Hold paramount safety, health, welfare of public. • Perform services in areas of their competence. • Issue public statements in an objective, truthful manner. • Act for each employer, client as faithful agents, trustees. • Avoid deceptive acts. • Conduct them honorably, responsibly, ethically, lawfully • To enhance the honor, reputation, usefulness of profession. • **The responsibilities of moral engineer.(7 M)** Loyalty to corporations, respect for authority, collegiality. Teamwork is a few important virtues in the field of Engineering. • **Loyalty**

	Loyalty is the faithful adherence to an organization, employer. **Loyalty to an employer can be either of the two types:** • **Agency-loyalty:** Acting to fulfill one's contractual duties to an employer. • **Attitude-loyalty :** A lot to do with attitudes, emotions A sense of personal identity as it does with actions. • **Collegiality** A work environment where responsibility, authority shared among colleagues. **Main factors that help in maintain harmony among members at a workplace are(2 M)** Respect Commitment Connectedness
2	**Explain a Balanced Outlook on Law. (13 M) (NOV/DEC2010)** (BTL2) **Answer Page 100- Mike W. Martin** **Explanation – (6 M)** • It stresses the necessity of laws and regulations • Limitations can understand with an overview of laws in engineering profession. • Individual needs, collective needs of the society stimulate harmony in society. • The ethical conduct can be applied with the help of laws. • Laws are important as people are not completely responsible. • The competitive nature of free enterprise system, does not encourage moral initiative. **Let us look at a few examples from the past that represent the importance of law.(7 M)** Babylon's Building Code Bhopal disaster
3	**Express in detail about engineers as responsible Experimenters. (13 M) (APR-MAY2017)** (BTL2) **Answer Page. 95 Mike W. Martin** **General responsibility of engineering as society(4 M)** • Engineers primarily considered as technical enablers, facilitators, rather than sole experimenters. • Responsibility is shared with management, the public and others. • The engineers should display virtue of being morally responsible person. **General features of moral responsible engineers(9 M)**

	• Conscientiousness • Relevant information • Moral Autonomy • Accountability **Conscientiousness:** Commitment to live according to certain values. **Relevant information:** Engineers properly gauge all information related to meeting one's moral obligations. **Moral autonomy:** The ability to think critically and independently about moral issues Apply moral thinking to situations, arise during professional engineering practice. **Accountability:** 'Accountability 'means being responsible, liable, answerable or obligated. Willingness to present morally convincing reason for ones action, conduct.
4	**Illustrate the codes of ethics set by professional societies. (13 M)** (BTL2) **Answer refer notes.** **Codes of ethics set by professional societies (13 M)** • Guided in all their relations by the highest standards of honesty and integrity. • Engineers shall at all times strive to serve the public interest. • Engineers shall avoid all conduct or practice that deceives the public. • Not disclose, without consent, confidential information concerning business affairs. • Engineers shall not influence in their professional duties by conflicting interests. • Engineers shall not attempt to injure, maliciously or falsely, directly or indirectly. • Guilty of unethical, illegal practice shall present information to proper authority for action. • Credit for engineering work to those to whom credit is due, recognize proprietary interests of others.
5	**Examine the roles played by the codes of ethics. (13 M) (MAY/JUNE2011,NOV/DEC 2013)(NOV/DEC2014)** (BTL1) **Answer Page no. 44 Mike W. Martin** **Code of ethics Meaning:(2 M)**

	To provide basic framework for ethical judgment for a professional. **Roles of Code of Ethics: (13 M)** **The code of ethics propagated by professional societies play a vital role. They are,** • Inspiration • Guidance • Support for responsible conduct • Deterring and disciplining unethical professional conduct • Educational and promotion of mutual understanding • Contributing to positive public image of profession • Protecting the status quo suppressing dissent within the profession • Promoting business interest through restraint of trade.
6	**How engineering project differ from standard experimentation? (13 M)(NOV/DEC 2013)** (BTL2) **Answer page no: 91 Mike W. Martin** **The scientific experiments in the laboratory and the engineering experiments in the field exhibit several contrasts as listed below: (13 M)** **Experimental control:** • Members for study selected into two Groups namely A, B at random. • Group A are given special treatment. • The group B Given no treatment, called 'controlled group'. • Placed in the same Environment as other group A. • Engineering, through random sampling, survey made among users • To assess results on product. **Humane touch:** • Engineering experiments involve human souls, their needs, views,& expectations, • Creative use as in case of social experimentation. • This view not agreed by many of engineers. • Quality engineers, managers fully realized this humane aspect. **Informed consent:**

	• Engineering experimentation viewed as Societal Experiment • Since subject, the beneficiary is human beings. • Medical practice- moral, legal rights Have recognized while planning experiments
7	**i. Explain limitations of code of ethics.** **ii. Briefly discuss the importance of code of ethics. (13M) (APR-MAY2017)** (BTL4) **Answer: (Refer notes)** **Definition of code of ethics (2 M)** The definition of a code of ethics is "a collection of principles and practices that a business believes in and aims to live by." It should be a document that goes along with the company mission and vision statement. Anyone who interacts with the company or works for the company should understand the code. Much of this is part of employee policy and guidelines, but it also carries over to dealing with vendors and partners. ***Limitations of Codes:*** **(3 M)** • Codes are restricted to general and vague wordings. • Engineering codes often have internal conflicts. • They cannot be treated as final moral authority for professional conduct. • Only a few practicing engineers are members of Professional Societies • Members of Professional Societies not aware of existence of codes oftheir societies never go through it. • Codes can be reproduced in a very rapid manner. • Codes said to be coercive i.e., implemented by threat, force. **The importance of code of ethics.(8 M)** • Step one: Get your priorities straight • Step two: Where to get your input • Step three: Common major pitfalls • Step four: Where to get help • Step five: Assigning someone to be in charge
8	**Discuss ethics in research (13M) (NOV/DEC2013/2018)** (BTL2) **Answers refer notes.** **INTRODUCTION: (3 M)** People think of ethics, think of rules for distinguishing between right, wrong, such as Golden Rule. **EXPLANATION: (10 M)**

	The following is a rough and general summary of some ethical principles: • Honesty • Integrity • Carefulness • Openness • Respect for Intellectual Property • Confidentiality • Responsible Publication • Responsible Mentoring • Respect for colleagues • Social Responsibility • Non-Discrimination • Competence • Legality • Animal Care • Human Subjects Protection
9	**Illustrate in detail about engineering as experimentation. (13M)** (BTL3) **Answer Page no 89 to 94 Mike W. Martin.** **Engineers as Experimenters: (4 M)** • Process of developing a product, an engineer generally learns through experimentation. a trial and error method is mostly used one to obtain results • Hence, primarily any experiment carried out with partial ignorance. • Outcomes of the experiments may not be as expected. • An engineer should always be ready for unexpected output. **Consider following points which are related to moral aspects of human behaviour(9 M)** • To maintain safety of human beings. • To procure their rights of consent. • To keep them aware regarding experimental nature of project. • To warn them about probable safety hazards. • Monitor results of experiment continuously.

	• Having autonomy in conducting experiments. • Accepting accountability for results of tproject. • Exhibiting their technical competence, characteristics of professionalism.
10	**How the ethical codes provide discipline among the engineers? (13M) (MAY/JUNE2014), (APR/MAY2015) (NOV/DEC 2014)** (BTL2) **Answer refer notes.** **EXPLANATION: (13 M)** • Engineers hold paramount safety, health, welfare of public • To comply with principles of sustainable development in performance of professional duties. • Engineers perform services only in areas of their competence. • Engineers issue public statements only in an objective, truthful manner. • Engineers act in professional matters for each employer • Avoid conflicts of interest. • Engineers build their professional reputation on the merit of their services • Not compete unfairly with others. • Engineers act in such a manner as to uphold and enhance the honor, integrity. • Act with zero tolerance for bribery, fraud, and corruption.
	PART * C
1	**Express in detail about the types and importance of industrial standards. (15M) (APRIL/MAY 2015)** (BTL2) **Answer refer notes.** **Types of standards:(11 M)** **Optimum standards:** • Facilitate the creation of political as well as business related advantages. **Formal standards:** • Strategic initiatives with broad applicability, with roles for ANSI, standards developers, industry, government. **Private standards:** • Developed by an organization or a trade association. **Testing standards:** • They provide a method to test products or materials.

	Performance standards: • Performance requirements usually measured using a specified test procedure, standard. **Dimensional standards:** • They establish a number of key dimensions that must be met. • This allows product inter changeability. **Quality standards:** • They describe certain characteristics that must be met • Insuring the buyer that some minimum level of quality is met. **Importance of standards (4 M)** • Administration, legislative bodies also benefited by Industry standard. • Standardization facilitates a healthy competition, designing of new concepts. • It ascertains the rank of an industry in the economic set up of a country. • Optimum standards facilitate creation of political, business related advantages. • Setting industry standard, to provide a platform for giving shape to new creations.
2	**Discuss the various ethical issues involved in Bhopal disaster. (15M) (May/June2009)** (BTL2) **Answer refer notes.** **EXPLANATION:(15 M)** • In case of Bhopal tragedy all of them were neglected. • The poor quality of the facility • Lack of many instruments was the reason for the leak. • Two out of three main safety systems unable to cope with situations. • The flare tower, water sprays for not functioning properly. • Public were never given any information about MIC, safety measures. • Location of plant close to settlement also one of ethical question to be raised. • "Perform services only in areas of their competence". • leak started after wash out of a pipe, had not sealed properly by a worker • Training did not meet standards and was ordered by novice supervisors.

3	**Compare and contrast engineering experiments with standard experiments. (15M) (Ma Y/June 2009) (NOV-DEC 2018)** (BTL4) **Answer Page No.89 to 94 Mike W. Martin Key points:** **Similarity to Standard Experiments(6 M)** • Carried out in partial uncertainties. • Outcomes of engineering projects, generally uncertain like other experiments • Requires thorough knowledge about products at pre-production, post-production stages. • Requires constant monitoring, alertness, • Vigil on part of the engineers at every stage of the project. **Differences between engineering experiments and other standard experiments.** **Experimental control (9 M)** **Experimental control:** • Members for study selected into two Groups namely A, B at random. • Group A are given special treatment. • The group B Given no treatment, called 'controlled group'. • Placed in the same Environment as other group A. • Engineering, through random sampling, survey made among users • To assess results on product. **Humane touch:** • Engineering experiments involve human souls, their needs, views,& expectations, • Creative use as in case of social experimentation. • This view not agreed by many of engineers. • Quality engineers, managers fully realized this humane aspect. **Informed consent:** • Engineering experimentation viewed as Societal Experiment • Since subject, the beneficiary is human beings. **Informed consent consists of two main elements:** • Knowledge: Human subjects should be given all information to make a reasonable decision. • Voluntariness: Human subjects, show their willingness to be a human model voluntarily. The person should not be forced, deceived, fraud, etc.

	UNIT-IV **SAFETY, RESPONSIBILITIES AND RIGHTS**
	Safety and Risk – Assessment of Safety and Risk – Risk Benefit Analysis and Reducing Risk – Respect for Authority – Collective Bargaining – Confidentiality – Conflicts of Interest – Occupational Crime – Professional Rights – Employee Rights – Intellectual Property Rights (IPR) – Discrimination.
	PART * A
1	**What is conflict Interest?(MAY/JUNE 2012) (NOV-DEC 2018)** BTL2 A situation that has the potential to undermine the impartiality of a person because of the possibility of a clash between the person's self-interest and professional interest or public interest. Types of Conflicts of interest: Actual conflict of interest Potential conflict of interest Apparent conflict of interest
2	**What are the reasons for Risk-Benefit Analysis?(NOV/DEC 2011, NOV/DEC 2013) (MAY/JUNE 2016)** BTL2 A risk-benefit analysis is a comparison between the risks of a situation and its benefits. The goal is to figure out whether the risk or benefit is most significant. It's used often in medicine, because every medical procedure has risks associated with it, and some procedures that could be beneficial actually turn out to statistically cause more harm than good. That's how medical researchers figure out whether certain procedures are worth doing and what types of people will benefit. • Risk-benefit analysis is concerned with the advisability of undertaking a project. • It helps in deciding which design has greater advantages. • It assists the engineers to identify a particular designs core higher with that of the another**.**
3	**Give few steps to reduce risks. (MAY/JUNE 2009)** BTL2 The factors are: • The engineer must have the right data. • Engineer should satisfy with the present design. • Engineer must test the safety of a product. • Engineer must measure and weight he risks with benefits for a product.
4	**Give the reasons for the Three Mile Island disaster? ((MAY/JUNE 2014)**BTL1

	In adequate training to the operators. Use of B&W reactors.
5	**List the two types of Risk.((MAY/JUNE 2012)** BTL1 • Personal Risk: An individual, who is given sufficient information, will be in a position to decide whether to take part in a risky activity or not . They are more ready to take on voluntary risks than in voluntary risks. • Public Risks: Risks and benefits to the public are more easily determined than to individuals, as larger number of people is taken in to account .Involuntary risks are found here.
6	**Define "risk".(May/June 2011)(NOV/DEC2014) (NOV-DEC 2016)**BTL2 A risk is the potential that something unwanted and harmful may occur. Risk = Probability X Consequences.
7	**What do you mean by voluntary risk? (May/June 2010, May/June 2010)** BTL2 If a person knowingly takes any risk, then he feels it safe. In contrast, if the same risk is forced to him, then he feels it unsafe. In simple terms the voluntary risks are considered as safe and the involuntary risks are considered as unsafe.
8	**What is safe risk and acceptability of risk? (IT Dec 2009,May 2010)** BTL2 Acceptability of risk: A risk is acceptable when those affected are generally no longer apprehensive about it. Apprehensiveness mainly depends on how the risk is perceived by the people. Safe Risk: If a person knowingly takes any risk then he feels it safe. In the same way voluntary risks are considered as safe risk
9	**List the methods that can be applied when testing is inappropriate. (May/June 2009)(NOV/DEC2014)** BTL1 • Scenario Analysis • Failure modes and effects analysis • Fault free analysis • Event free analysis
10	**What is the use of knowledge of risk acceptance to engineers?** BTL2 Though past experience and historical data give better information about safety of products designing there are still inadequate .The reasons are

	• The information is not freely shared among industries. • There also new applications of old technologies that provides available data, which are less useful. • So, in order to access the risk of a product, the engineers must share their knowledge and information with others in a free manner.
11	**What are the positive uncertainties in determining risks?** BTL2 • Purpose of designing • Application of the product • Materials and the skill used for producing the product
12	**What is the Risk Transfer?** BTL2 It refers to the legal assignment of the cost of certain potential losses from one party to another. The most common way of affecting such transfer is by insurance.
13	**What are the steps involved in design for safety? ((MAY/JUNE 2014)** BTL2 • Define the problem • Generate alternate solutions • Analyses each solution • Test the solution • Select the best solution • Implement the chosen solution**.**
14	**State the industrial definition on safety .(MAY/JUNE 2014)** BTL1 • A ship in harbour is safe, but that is not what ships are built for – John A. Shedd • A thing is safe if its risks are judged to be acceptable,, - William W. Lawrence • We buy an ill-designed Iron box in a sale- Underestimating risk • We judge fluoride in water can kill lots of people - Overestimating risk • We hire a taxi, without thinking about its safety - Not estimating risk
15	**What is meant by Disaster? (MAY/JUNE 2014, NOV/DEC 2013)** BTL2 A DISASTER = A seriously disruptive event + A state of unpreparedness. E.g., Titanic collision with an iceberg, at night: Emergency Fewer lifeboats, inadequate training and warnings of icebergs unheeded ->Disaster
16	**What is informed consent? (MAY/JUNE 2011)(APR/MAY 2015)** BTL2 Informed consent is the process by which the treating health care provider discloses appropriate Information to a competent patient so that the patient may make a voluntary choice to accept or refuse treatment. It originates from the legal and ethical right the patient

	has to direct what happens to her body and from the ethical duty of the physician to involve the patient in her health care.
17	**What is the use of risk analysis?(APR/MAY 2015) (MAY/JUNE 2016) (APR/MAY 2017)**BTL2 Risk analysis is the process of defining and analyzing the dangers to individuals, businesses and government agencies posed by potential natural and human-caused adverse events.
18	**List the two types of authority given by Martin and Schinzinger. (May/June2011,NOV/DEC 2014),(APR/MAY2015)** BTL1 **Martin and Schinzinger define two types of authority** Institutional authority • Associated with administrative position Expert Authority • Accrues from specialized knowledge
19	**What are the elements of collegiality? (May/June 2010, NOV/DEC 2014)(Nov/Dec 2013) (MAY/JUNE 2014)** BTL2 • Respect • Commitment • Connectedness • Cooperation
20	**What do you mean by employee rights? And lists its categories. (Nov/Dec 2012)** BTL2 Employee rights are rights, moral or legal, that involve the status of being an employee. They include some professional rights that apply to the employer-employee relationship. Categories: • workplace safety • Civil rights • Family and medical leave • Workers compensation • Labor relations laws.
21	**What is the Basic Right of Professional Conscience? (MAY/JUNE 2011)** BTL2 The right to do what everyone agrees it is obligatory for the professional engineers to do the basic professional right is an entitlement giving one the moral authority to act without interference from others.
22	**What is Institutional authority? (NOV/DEC 2011)** BTL2 • Associated with administrative position.

	• Those with authority have the right to administer their duties and the freedom to actually achieve organizational goals by expending the resources available to them. This type of authority usually goes with the position: • Managers • Administrators • Project Engineers
23	**Define the term safety. How is it related to risk? (NOV-DEC 2018)** BTL2 Safety is a concept that includes all measures and practices taken to preserve the life, health, and bodily integrity of individuals. In the workplace, safety is measured through a series of metrics that track the rate of near misses, injuries, illnesses, and fatalities. In order to improve these metrics, employers and safety officials must also conduct investigations following any incident to ensure that all safety protocols and measures are being followed or to implement new ones if needed. **Safety relation with risk:** • Identifying a hazard • Collecting information and analyzing risk associated with it • Determining how to remove or reduce its effect by completely eliminating the process or equipment • Replacement with a better equipment or process • Using advanced technology or design and physically isolating processes or direct contact of user by the use of appropriate collective or personal protective equipment.
24	**Define term collective bargaining. (MAY/JUNE 2014)(NOV-DEC 2016) (APR/MAY 2017) (MAY/JUNE 2016)**BTL2 • There is a limit of one representative for each unit of employees • All representatives must promote the practice, and follow all procedures, of collective bargaining • Employers must bargain with the employees' representatives • Employees and their representatives have the right to discuss wage issues
25	**What do you mean by IPR? (APR/MAY 2017)** BTL2 Intellectual property rights are the rights given to persons over the creations of their minds. They usually give the creator an exclusive right over the use of his/her creation for a certain period of time.
26	**What is the difference between bribe and gifts? (Nov/Dec 2014)**BTL2 Gift: Something of value given without the expectation of return

	Bribe: Something of value given with the hope of a future influence or benefit
	PART * B
1	**What is risk benefit analysis? Explain the procedure in Risk Benefit Analysis. Discuss its roles in reducing risks. (13M) (Nov/Dec 2010, May/June2011) (NOV/DEC 2014) (APR/MAY 2017) (NOV-DEC 2016) (NOV/DEC 2018)** BTL2 **Answer: page: 128to 133T - Mike W. Martin** **Introduction: (2 M)** A risk-benefit analysis is a comparison between the risks of a situation and its benefits. The goal is to figure out whether the risk or benefit is most significant. • Uncertainties in design • Personal risk • Public risk and public acceptance **Various procedure in adopting risk benefit analysis: (8M)** • Identify the risks early on in your project. • Communicate about risks • Consider opportunities as well as threats when assessing risks. • Prioritize the risks • Fully understand the reason and impact of the risks. • Develop responses to the risks • Develop the preventative measure tasks for each risk. • Develop the contingency plan for each risk. • Record and register project risks. • Track risks and their associated tasks. **Role in reducing risks: (3 M)** • Application of inherent safety concept in design. • Use of redundancy principle in the instrument protection • Regular inspection • Training and operating personnel • Conducting regular safety audits • Development of well-designed emergency evacuation plan and regular rehearsal.
2	**Define the term risk and safety. Explain how an engineer assesses the risk? (13M) (NOV/DEC 2014) (Nov/Dec 2013) (NOV-DEC 2016)** BTL2 **Answer: Page: 121 - Mike W. Martin (2 M)**

	Define risk: "Potential for the realization of unwanted consequences from impending events." **Define safety:** "A thing is safe if its risks are judged to be acceptable." **(2 M)** **Definition** **(2 M)** A safety risk assessment is a systematic procedure for identifying and managing hazards. It encompasses thorough examination of the entire work environment, processes and equipment to determine any hazard to the health of the employees in the short or long term and implementing remedies. **Risk assessment:** **(3 M)** ▪ Risk assessments are recorded retained for significant hazards. ▪ Risk assessments are suitable, sufficient. ▪ Staffs are aware of, understand relevant risk assessments. ▪ Risk assessments are reviewed periodically **Risk assessment process:** **(4 M)** • Identify the hazards associated with a procedure • Consider who may be exposed and what is the maximum possible exposure • Include storage waste, disposal and cleaning, if appropriate. • List existing control measures. • Consider emergency procedures. • If further control measures required, list and set actions
3	**Describe the concept of Occupational crime with examples. (13M) (Nov/Dec 2013)(Apr/May 2015) (Nov/Dec 2015)** BTL2 **Answer: Page: 128 M - Mike W. Martin** **Block and Geis (Man, Crime and Society, 1970: 307) have classified occupational offenders into five groups on the basis of the nature of victim involved: (4 M)** • Persons acting as individuals against other individuals (e.g., fraudulent lawyers, doctors), • Those committing crimes against business concerns that employ them (embezzlers), • Those in policy-making positions who commit crimes for their organizations (anti-trust violators), • Agents of an organisation who victimize the general public (advertising fraud), and • Merchants victimizing their customers (short-weighing). • This method is simple. The victim could be employer, employee, public concern, government organisation, and so forth. **Types of occupation crime:** **(9 M)** • Price fixing • Endangering lives • Industrial espionage
4	**Write brief notes on** (i) **Whistle blowing (ii) Discrimination (13M) (APRIL/ MAY 2015)** BTL3

	Answer: Page: 172-173 - Mike W. Martin **Whistle blowing (6 M)** • A whistleblower is a person who exposes any kind of information • Exposes activity that is deemed illegal, unethical. • Exposes, which is not correct within an organization that is either private or public. Types of whistle blowing: • Internal Whistle Blowing • External Whistle Blowing • Open Whistle Blowing • Anonymous Whistle Blowing **Discrimination (7 M)** **Definition** It is referred to prejudice resulting from denial of an opportunity, unfair treatment in the job selection, promotion and transfer is called discrimination. **Types of Discrimination** • Direct discrimination • Indirect discrimination • Pregnancy and maternity discrimination • Absence from work because of gender reassignment • Discrimination connected to your disability • Duty to make reasonable adjustments for disabled people • Sexual harassment • Victimization
5	**Explain the types and advantages of Intellectual property rights. (13M) (Nov/Dec 2015) (APRIL/ MAY 2013,NOV/DEC 2013) (NOV/DEC 2014) (MAY/JUNE 2016) (APRIL/ MAY 2015)** BTL2 **Answer Refer Notes** **Intellectual property rights: (2 M)** Intellectual property rights are the rights given to persons over the creations of their minds. They usually give the creator an exclusive right over the use of his/her creation for a certain period of time. **Types of Intellectual Property Rights: (8 M)** Intellectual Property Rights can be further classified into the following categories −

	• Copyright • Patent • Trade mark • Trade Secrets, etc. **Advantages of Intellectual Property Rights (3 M)** • Provides exclusive rights to the creators or inventors. • Encourages individuals to distribute and share information and data instead of keeping it confidential. • Provides legal defence and offers the creators the incentive of their work. • Helps in social and financial development.
6	**Explain the concept of Confidentiality in detail. (13M) (NOV/DEC 2011)** BTL2 **Answer: Page: 146 to 148 -Mike W. Martin** **Introduction: (2 M)** • Any information that is desirable to keep secret. Usually has some exploitable value for business purposes **Types of information (8 M)** – Public (available to anyone) – Private (restricted/conditional availability) • Confidential • Privileged • Proprietary • Trade secrets (and ~patents) How companies might handle you changing jobs when confidentiality is at risk: **(3 M)** • Employee sign employment contracts that place constraints on future employment • Company give positive benefits to those leaving such as special pension considerations, the opportunity to do consulting etc. • Company works with employees to show the damage that can be done if information is passed on.
7	**Explain a detailed note about collective bargaining. (13M) (APRIL/ MAY 2010), (NOV/DEC 2013) (NOV/DEC 2014) (APRIL/ MAY 2015)** BTL2 **Answer: Page: -5.8 - V.Jayakumar** **collective bargaining: (3 M)** • There is a limit of one representative for each unit of employees

	• All representatives promote practice, and follow all procedures, of collective bargaining • Employers must bargain with the employees' representatives • Employees and their representatives have the right to discuss wage issues **Collective Bargaining Process** Preparation : **(10 M)** Choosing a negotiation team and representatives of both the union and employer. Discussion: Parties meet to set ground rules for collective bargaining negotiation process. Proposal: Representatives make opening statements, outlining options, possible solutions to issue at hand. Bargaining: Following proposals, parties discuss potential compromises, bargaining to create an agreement that is acceptable to both parties. A "draft" agreement, which is not legally binding, but a stepping stone to coming to a final collective bargaining agreement. Final Agreement: Once an agreement is made between the parties, it must be put in writing, signed by the parties, and put into effect.
8	**Discuss on Respect for authority and Conflict of interest. (13M) (MAY/JUNE 2014) (NOV/DEC 2014)** BTL2 **Answer: page: 150 to 151 - Mike W. Martin** **Respect for authority: (2 M)** • Authority is the "potential and resources" to accomplish tasks. • Power is the capability to do so • Authority gives the right to control decisions affecting the company's interests • Engineers must respect the authority of their employers **Martin and Schinzinger define two types of authority (5 M)** • Institutional authority Associated with administrative position • Expert Authority Accrues from specialized knowledge • Morally Justified Authority Institutions can try to direct engineers to do things that are not "morally justified"

	• Obliged to respect legitimate authority Does not give right to ignore legitimate directives Respecting authority comes second when: Lives are threatened Financial corruption is involved Grave economic loss may result **Conflict of interest: (2 M)** • "Professional conflicts of interest are situations where professionals have an interest which, if pursued, might keep them from meeting their obligations to their employers or clients."(M&S) • Three types of conflict of interest (Harris, Pritchard and Rabins, 2000) **(4 M)** • Actual • Potential • Apparent
9	**Explain the concept of Human rights and employee rights. And its role in organisation (13M) (MAY/JUNE 2014) (Nov/Dec 2013) (NOV/DEC 2014) (APRIL/ MAY 2015) (APR/MAY 2017)** BTL2 **Answers refer notes.** **Human rights: (3 M)** • Based on the principle of respect for the individual. • Each person morally, rationally treated who deserves to be treated with dignity. • Rights to which everyone is entitled—no matter who they are, where they live—simply because they are alive. **Employee rights. (2 M)** • An employee right can be any right, moral or legal, that involves status of being an employee. • They involve some professional rights also, such as the right to be paid according to the salary mentioned in one's contract. • Privacy and equal opportunity can be considered essential rights too. **Employee rights (4 M)** All employees have basic rights in the workplace -- including • The right to privacy • Fair compensation • Freedom from discrimination. • Equal Opportunity – Non-discrimination • Equal opportunity – Affirmative Action

	Rights of an Employee: (4 M) An employee is, at the very least, entitled to the following rights at his workplace − • No discrimination at work, especially on the basis of gender, nationality, religion, medical condition, and political affiliation. • Healthy work-life balance, which means no long hours at work. Employees can also report if their employer makes unnecessary delays in delegating work. • Protection of job for people with disabilities and medical conditions. • Complete protection against sexual harassment of any kind and immunity from being forced to exchange favors for benefits. • Freedom to discuss the terms and conditions of the employment with other employees and negotiating wages to suit lifestyle as per changing times. • Right to ask for safe working conditions and reservation to answering questions on age, religion, nationality, and medical condition. • Demanding certain changes and modifications regarding the working conditions to accommodate situations that might crop up due to their prevailing medical conditions. • Right to form or participate a union that aims to improve the wages, lifestyle, working environment, and emphasizes on employee rights at the workplaces.
10	**Discuss professional rights in an engineer field.(13M) (APRIL/ MAY 2015) (MAY/JUNE 2014) (NOV/DEC 2014) (Nov/Dec 2013)** BTL2 **Answer: Page: 163 - Mike W. Martin** **Professional Rights (3 M)** The rights that engineers have as professionals are called Professional Rights. These professional rights include : • The basic right of professional conscience. • The right of conscientious refusal. • The right of professional recognition **Professional rights set by professional societies (10 M)** • Guided in all their relations by the highest standards of honesty and integrity. • Engineers shall at all times strive to serve the public interest. • Engineers shall avoid all conduct or practice that deceives the public. • Not disclose, without consent, confidential information concerning business affairs.

	• Engineers shall not influence in their professional duties by conflicting interests. • Engineers shall not attempt to injure, maliciously or falsely, directly or indirectly. • Guilty of unethical, illegal practice shall present information to proper authority for action. • Credit for engineering work to those to whom credit is due, recognize proprietary interests of others.
11	**Discuss the 'faithful agent argument' and 'public service argument' of collective with suitable examples. (13M) (NOV-DEC 2018)** BTL2 Answer Refer notes: Engineers shall act in professional matters for each employer or client as faithful agents or trustees, and shall avoid conflicts of interest or the appearance of conflicts of interest. (7 M) a. Engineers shall avoid all known conflicts of interest with their employers which could influence their judgment or the quality of their services. b. Engineers shall not undertake any assignments which would knowingly create a potential conflict of interest between themselves and their clients or their employers. c. Engineers shall not accept compensation, financial or otherwise, from more than one party for services on the same project. d. Engineers shall not solicit or accept financial or other valuable considerations, for specifying products without disclosure to their clients or employers. e. Engineers shall not solicit or accept gratuities, directly or indirectly, from contractors, their agents, or employers in connection with work for which they are responsible. f. Engineers shall not participate in considerations or actions with respect to services provided by them or their organization(s) in private or product engineering practice. g. Engineers shall not solicit an engineering contract from a governmental body or other entity on which a principal, officer. h. Engineers shall exercise careful judgment in their determinations to ensure a balanced viewpoint, and avoid a conflict of interest. i. When, as a result of their studies, Engineers believe a project(s) will not be successful, they shall so advise their employer or client. j. Engineers shall treat information coming to them in the course of their assignments as confidential, and shall not use such information as a means of making personal profit. (1) They will not disclose confidential information concerning the business

affairs or technical processes

(2) Not reveal confidential information or finding of any commission or board of which they are members unless required by law or court order.

(3) Designs supplied to Engineers by clients shall not be duplicated by the Engineers for others without the express permission of the client(s).

k. Engineers shall act with fairness and justice to all parties when administering a construction (or other) contract.

l. Before undertaking work for others in which Engineers may make improvements, plans, designs, inventions, Engineers shall enter into positive agreements regarding the rights of respective parties.

m. Engineers shall admit their own errors when proven wrong and refrain from distorting or altering the facts to justify their mistakes or decisions.

n. Engineers shall not accept professional employment or assignments outside of their regular work without the knowledge of their employers.

o. Engineers shall not attempt to attract an employee from other employers or from the marketplace by false or misleading representations.

'PUBLIC SERVICE ARGUMENT' (6 M)

Engineers shall hold paramount the safety, health and welfare of the public in the performance of their professional duties.

a. Engineers shall recognize that the lives, safety, health and welfare of the general public are dependent upon engineering judgments.

b. Engineers shall not approve nor seal plans and/or specifications that do not conform with accepted engineering standards.

c. Should the Engineers' professional judgment be over ruled under circumstances where the safety, health, and welfare of the public are endangered.

(c.1) Engineers shall do whatever possible to provide published standards, test codes and quality control procedures that will enable the public to understand the degree of safety.

(c.2) Engineers will conduct reviews of the safety and reliability of the design, products or systems for which they are responsible before giving their approval to the plans for the design.

(c.3) Should Engineers observe conditions, which they believe, will endanger public safety or Health.

d. Should Engineers have knowledge or reason to believe that another person or firm may be in violation of any of the provisions of the Guidelines?

(d.1) They shall advise proper authority if an adequate review of the safety and reliability of the

	Products or a system has not been made. (d.2) They shall withhold approval of products of systems when changes or modifications are made which would adversely affect its performance insofar as safety and reliability are concerned. e. Engineers should seek opportunities to be of constructive service in civic affairs and work for the advancement of the safety, health and well being of their communities. f. Engineers should be committed to improving the environment to enhance the quality of life.
12	**Explain the factors that affect Risk Acceptability? And the knowledge required to assess the risk by engineer.(13M) (MAY- JUN 2016) (Nov/Dec 2013)** BTL2 **The Factors That Affect Risk Acceptability (6 M)** • Voluntarism and control • Effect of information on risk assessment • Job related pressures • Magnitude and proximity of the people facing risk **The knowledge required to assess the risk by engineer (7M)** • Data in design • Uncertainties in design • Testing for safety • Analytical testing • Risk-benefit analysis
	PART * C
1	**Discuss the significance of intellectual property rights. Also Explain the legislations covering intellectual property rights in India. (15M) (NOV/DEC 2013) (MAY-JUN 2016) (MAY/JUNE 2014) (NOV/DEC2014)** BTL2 **Answers refer notes.** **SIGNIFICANCE: (4 M)** • Clear identification of the IP. • Unambiguous title to the asset. • Qualitative and quantitative characteristics of the IP. • Earnings capacity and profitability relating to the IP. • Market share supported by, or as a result of, the IP. • Legal rights restrictions, competition, barriers to entry, risks associated with the IP. • Product life cycles and positioning.

	• Historical growth and prospects for the future. **Firms of all sizes and purpose are motivated by similar goals in the creation of such programs:** • To identify what constitutes a risk sensitive intangible asset; **(4 M)** • To address new and emerging threats to IP; • To properly allocate available risk resources given limited funds; and • To achieve compliance within the legal and regulatory environment in which they operate. The TRIPS Agreement came into effect on 1st January 1995, is considered till date most complete multilateral agreement on intellectual property. The areas of intellectual property, it covers are as following: **(7 M)** • Trademarks which include service marks as well. • Industrial designs. • Copyright and related rights (i.e. producers of broadcasting organisation, the rights of performers) • Geographical indications which include appellations of origin. • The lay-out designs (topographies) of assimilated circuits. • The information which are not closed which includes test data and trade secrets. • Patents which include protection of new varieties of plants.
2	**(i) Discuss the significance of loyalty and collegiality in team work.(15M)(MAY-JUN 2014) (NOV/DEC2014) (APRIL/ MAY 2015)** **(ii) Explain the different types of collective bargaining.(APRIL/ MAY 2015)** BTL2 **Answer: Page: 150-151 - Mike W. Martin.** • **Loyalty** **(4 M)** Loyalty is the faithful adherence to an organization, employer. **Loyalty to an employer can be either of the two types:** • **Agency-loyalty:** Acting to fulfill one's contractual duties to an employer. • **Attitude-loyalty :** A lot to do with attitudes, emotions A sense of personal identity as it does with actions. **Collegiality** **(3 M)** • To improve the respect in work place • To help to maintain the better relation in the organisation • To increase the value of relationship

	• To maximise the method of communication • Motivates unity in the workplace. • Offers differing perspectives and feedback • Improved efficiency and productivity • Provides great learning opportunities • Promotes workplace synergy **Definiton:** Collective Bargaining. **(2 M)** The Collective Bargaining is the process wherein the unions (representatives of employees or workers), and the employer meet to discuss the issues related to wage, the number of working hours, work environment and the other terms of the employment **Types of collective bargaining:** **(6 M)** • Conjunctive or Distributive Bargaining • Co-operative or Integrative Bargaining • Productivity Bargaining • Composite Bargaining
3	**Discuss the features of whistle blowing. (15M) (NOV/DEC2014) (15M)** BTL2 **Answer : Page: 177 to 178 - Mike W. Martin** **The features of whistle blowing:** • Evidence A whistleblower must have evidence that someone, usually a corporation or government contractor • Documentation The whistleblower needs to have more than just suspicions; he or she needs to collect concrete and legitimate documentation of the wrongdoing • Information Gathering Names and contact information of the parties involved in the wrongdoing, laws that he or she believes are being violated by said parties • Confidentiality The whistleblower should keep the information and the case absolutely confidential and avoid discussing it with anyone. • Settle in for the Long Haul Since cases like these often take a long time to settle, the whistleblower should prepare for a long process • Prepare for Backlash It's not uncommon for a whistleblower to be accused of being privy to the wrongdoing or even

	participating in it. • Look for New Employment Whistleblowers can get a bad reputation, which can affect finding a new job, so getting a new one before that happens is important • Be a Model Citizen Being a model citizen and not doing anything that can be used against them is important for whistleblowers. • Get Support In addition to finding an attorney for legal help, whistleblowers should look into resources like the National Whistleblowers Canter
4.	**Safety in a commodity comes with a price' – Explain. And discuss how the knowledge of risk is always better for safety with suitable examples. (15M) (NOV-DEC 2018)** BTL2 **Answer refer notes:** **Safety in a commodity comes with a price' (8 M)** • Absolute safety is never possible to attain and safety can be improved in an engineering product only with an increase in cost. • On the other hand, unsafe products incur secondary costs to the producer beyond the primary (production) costs, like warranty costs loss of goodwill, loss of customers, litigation costs, downtime costs in manufacturing, etc. • Figure indicates that P-Primary costs are high for a highly safe (low risk) product and S-Secondary costs are high for a highly risky (low safe) product. • If we draw a curve T=P+S as shown, there is a point at which costs are minimum below which the cost cannot be reduced. If the risk at Minimum Total Cost Point is not acceptable, then the producer has to choose a lower acceptable risk value in which case the total cost will be higher than M and the product designed accordingly. • It should now be clear that safety comes with a price only. **"Knowledge of risk for better safety".(7 M)** • Robert Stephenson writes that all the accidents, the harms caused and the means used to repair the damage should be recorded for the benefit of the younger Members of Profession. • A faithful account of those accidents and the damage containment was really more valuable than the description of successful work. • Hence it is imperative that knowledge of risks will definitely help to attain better safety.

	But it should be borne in mind, that still gaps remain, because i) There are some industries where information is not freely shared ii) There are always new applications of old technology that render the available information less useful.

	UNIT V GLOBAL ISSUES
	Multinational Corporations – Business Ethics - Environmental Ethics – Computer Ethics - Role in Technological Development – Weapons Development – Engineers as Managers – Consulting Engineers – Engineers as Expert Witnesses and Advisors – Honesty – Moral Leadership – Sample Code of Conduct.
	PART * A
1	**State the term called embezzlement. (APRIL/ MAY 2011)** BTL2 Embezzlement is a form of white-collar crime wherein a person or entity misappropriates the assets entrusted to him or her. In this type of fraud the assets are attained lawfully and the embezzler has the right to possess them, but the assets are then used for unintended purposes. Embezzlement is a breach of the fiduciary responsibilities placed upon a person.
2	**What is technology transfer? (APRIL/ MAY 2010)** BTL2 Technology transfer is a process of changing the technology to a new setting and implementing it. Technology includes hardware such as machines and installations as well as techniques such as technical, organizational and managerial skills and procedures**.**
3	**Write a note on moral leadership. APRIL/MAY2010) (NOV/DEC 2014)** BTL2 Whenever the goals of a leader become permissible and also morally valuable, it is known as moral leadership. Moral leadership also means that employing morally acceptable ways to motivate the groups to move towards morally desirable ways. The ways are depending on the situations.
4	**State the most important ethical mistake made by the multinational corporation which caused Bhopal gas plant disaster. (NOV/DEC 2010)** BTL1 • The tanks used to store Methyl Iso-cyanate were overloaded to a tune of 75%. • The emergency plant was also filled with a large amount of chemicals. • The entire refrigeration unit had been shut down as a measure to reduce the cost and this Led to increase of temperatures to a higher level. • One of the disappointed workers unscrewed a pressure gauge on a tank and inserted a hosepipe into it, knowing that it would cause damage, but not to this extent. • Scrubber has also been shut down. • Flare tower was also not in an operating condition. • Unfortunately there were no emergency drills or evacuation plants available.
5	**Define Conflict resolution. (APRIL/ MAY 2010)** BTL2 Conflict resolution means a process of resolving dispute or disagreement. It mainly aims at

	reconciling opposing arguments in a manner that promotes and protects the human rights of all parties concerned.
6	**What is contextualizing? (APRIL/MAY 2010)** BTL2 In accordance to Gilligan women try hard to preserve personal relationship with all people. This context-oriented emphasis on maintaining personal relationship is called as ethics of care in contrast With ethics of rules and rights.
7	**Give a short note on ethical pluralism and ethical relativism. (APRIL/MAY 2010)** BTL2 Ethical pluralism: According to this view there may be alternative moral perspectives that are reasonable, but no one of which must be accepted completely by all rational and morally concerned persons. Ethical relativism: Actions are morally right when they are approved by law or custom they are wrong when they violate laws or customers.
8	**What should an ethical expert witness, even though hired by a company, expected to do? (APRIL/MAY 2010)** BTL2 Engineers should not become the hired-guns to their clients, but instead remain as objective as humanly possible in their investigations and the conclusions they reach .They should avoid biases resulting from money ego, and sympathy.
9	**List down the international rights listed by Donaldson. (NOV/DEC 2014)** BTL2 Thomas Donaldson in his book _The ethics of International Business,, has listed the following as the International rights: • The right to freedom of physical movement • The right to ownership of property • The right to freedom from torture • The right to a fair trial • The right to non discriminatory treatment • The right to physical security • The right to freedom of speech and association • The right to minimal education • The right to political participation • The right to subsistence.
10	**Define appropriate technology. (Nov 2008)** BTL2 Appropriate technology refers to the identification, transfer and implementation of the most suitable technology for a new set of conditions.

11	**List out four examples for Multinational Corporation.(Nov 2010)** BTL1 Large corporations having investment and business in number of countries are known as Multinational or Transnational corporation. Some of them are : Hindustan Lever, Ford, Toyota, Sony, LG, Smith Kline Beecham, ITC, Ponds etc.
12	**Define computer ethics. (DEC/NOV2010) (NOV/DEC 2016)** BTL2 Ethics is a set of moral principles that govern the behaviour of a group or individual. Therefore, computer ethics is set of moral principles that regulate the use of computers. Some common issues of computer ethics include intellectual property rights (such as copyrighted electronic content), privacy concerns, and how computers affect society.
13	**Write a short note on globalization. (MAY/JUN2016)**BTL2 Our lives are increasingly dependent upon the goods/services produced over the world and are influenced by the business from around all the corners of the world. In general world has become a global village and have a global economy. The increasing international flow of capital, technology, trade, and people have had the effects of changing the nature of local organizations governments and people of countries and have led to social changes and developments.
14	**List the three senses of relative values. (DEC/ NOV 2012)** BTL2 • Ethical Relativism The theory that holds that morality is relative to the norms of one's culture. • Descriptive Relativism The existence of moral disagreements between cultures or individuals. • Moral Relativism More easily understood in comparison to moral absolutism. Absolutism claims that morality relies on universal principles (natural law, conscience).
15	**What are the normal issues arise in Multinational Corporation?(MAY/JUNE 2014)** BTL2 Ethical dilemmas faced by certain companies may be specific to their industry or company; other types of ethical issues are common to all types of companies. Handling ethical decisions with wisdom is especially important for small businesses, given the potentially devastating effects these companies may face if such issues aren't handled correctly**.**
16	**Differentiate the Eye witness and expert witness in the legal system. (MAY/JUNE 2014)** BTL4 An eyewitness is one who testifies what they perceived through his or her senses (e.g. Seeing, hearing, smelling, touching). That perception might be either with the unaided human sense or

	with the aid of an instrument, e.g., microscope or stethoscope, or by other scientific means, e.g. a chemical reagent which changes color in the presence of a particular substance An expert witness is one who allegedly has specialized knowledge relevant to the matter of interest, which knowledge purportedly helps to either make sense of other evidence, including other testimony, documentary evidence or physical evidence (e.g., a fingerprint)
17	**What is meant by Moral Leadership? (NOV/DEC 2013) (MAY/JUN 2016) (APRIL/ MAY2015) (NOV–DEC 2014)** BTL2 Moral Leadership is a very different kind of leadership. Rather than aspiring to being followed, Moral Leaders aim to serve. Instead of showcasing their own skills, Moral Leaders tend to develop the capacities of others.
18	**Define the term honesty and moral leadership.** BTL2 Honesty :A facet of moral character that connotes positive and virtuous attributes such as Integrity, truthfulness, and straightforwardness, along with the absence of lying, cheating, or theft "Moral Leadership": A process of social influence in which one person enlists the aid and support of others in accomplishing a common task.
19	**Write a note on business ethics. (APRIL/ MAY2015)** BTL2 Business ethics (also corporate ethics) is a form of applied ethics or professional ethics that Examines ethical principles and moral or ethical problems that arise in a business environment. It applies to all aspects of business conduct and is relevant to the conduct of individuals and entire organizations**.**
20	**What is meant by hired guns? (APRIL/ MAY 2011)** BTL2 Engineers are hired by attorneys to help them to establish the facts in away favourable to their clients. The hired guns violate the standards of honesty and also due care in conducting investigations.
21	**What is meant by corporate social responsibility?(NOV-DEC 2018)(APR-MAY 2017)** BTL2 Corporate social responsibility (CSR) is how companies manage their business processes to produce an overall positive impact on society. It covers sustainability, social impact and ethics, and done correctly should be about core business - how companies make their money - not just add-on extras such as philanthropy.
22	**What are demerits of MNC'S to host country? (NOV-DEC 2018)** BTL2 (i) Danger for Domestic Industries (ii) Repatriation of Profits

	(iii) No Benefit to Poor People (iv) Danger to Independence (v) Disregard of the National Interests of the Host Country (vi) Misuse of Mighty Status (vii) Careless Exploitation of Natural Resources
	PART * B
1	**Explain the philosophical view of nature in environmental ethics. Discuss the approaches to resolve environmental problems.(APRIL/ MAY2011) (APRIL/ MAY2015) (MAY–JUN 2014) (NOV–DEC 2013) (NOV–DEC 2014) (13M)** BTL2 **Answer: page: Refer Notes** **The philosophical view of nature: (8 M)** • Sentient – centered ethics • Bio-centric- Ethics • Eco-centric – ethics • Human - centered environmental ethics **The approaches to resolve environmental problems: (5 M)** • Cost oblivious approach • Cost benefit analysis
2	**Describe the Bhopal Gas Tragedy and its effects.(APRIL/MAY 11) (13M)** BTL2 **Answer: Page: 245-248 - Mike W. Martin** **Introduction (5 M)** Bhopal disaster, also referred to as the Bhopal gas tragedy, was a gas leak incident on the night of 2–3 December 1984 at the Union Carbide India Limited (UCIL) pesticide plant in Bhopal, Madhya Pradesh, India. It was considered as of 2010 to be the world's worst industrial disaster **Explanation (8 M)** • Liquid MIC storage • Earlier leaks • Acute effects • Gas cloud composition • Immediate aftermath • Subsequent legal action • Post-settlement activity
3	**Explain the different code of ethics of professional engineering societies. (NOV/DEC**

	2012) (13M) BTL2 **Answer: Refer Notes** **Code of ethics Meaning:(2 M)** To provide basic framework for ethical judgment for a professional. **Code of ethics of professional engineering societies.(11M)** ▪ American society of mechanical engineers ▪ American society of civil engineers ▪ Institute of electrical and electronics engineers ▪ The institution of engineers ▪ National society of professional engineers ▪ American institute of chemical engineers ▪ Association of computer machinery ▪ Computer society of India
4	**Write briefly on Engineer used as expert witness and advisers. (13 M) (APR-MAY2017) (MAY/JUNE 2013) (MAY/JUNE 2014) (NOV–DEC 2018) (NOV–DEC 2015) (MAY/JUN 2016) (NOV–DEC 2014)** BTL3 **Answer: Refer Notes** **Engineer used as expert witness. (2 M)** "An expert witness is a witness who has knowledge beyond that of the ordinary lay person enabling him/her to give testimony regarding an issue that requires expertise to understand." USLEGAL goes on to explain, "Experts are allowed to give opinion testimony which a non-expert witness may be prohibited from testifying to. In court, the party offering the expert must lay a foundation for the expert's testimony. Laying the foundation involves testifying about the expert's credentials and experience that qualifies him/her as an expert. Sometimes the opposing party will stipulate (agree to) to the expert's qualifications in the interests of judicial economy." **Abuses of engineers as expert witness: (5 M)** • Hired guns • Financial biases • Ego biases • Sympathy biases **Engineers as expert advisers: (6 M)** **Normative model of advisers:** • Hired guns • Value neutral analysts • Value guided advocates
5	**Discuss the roles and responsibilities of engineers and managers. (13 M) (MAY/JUNE 2014) (NOV–DEC 2014)** BTL2 **Answer : Refer Notes** **Roles of managers: (7 M)**

	• Interpersonal • Informational • Decisional **Responsibilities of engineers and managers: (6 M)** • Promoting ethical climate • Resolving the conflicts • Principles of conflict resolution
6	**Explain the engineers as consultants. (13 M) (MAY/JUNE 2014) (APR-MAY 2017 (NOV-DEC 2018) (NOV–DEC 2015)** BTL2 **Answer Refer notes.** **Introduction: (2M)** Engineers in consulting engineering companies come from virtually every discipline and specialty. These engineers are often referred to as consulting engineers and they participate in project teams to help the consulting engineering firm deliver services to its clients. **The responsibilities of consulting engineers: (11 M)** • Advertising • Competitive bidding • Contingency fees • Safety and client needs • Provision for resolution of disputes
7	**Discuss the following in detail Computer Ethics. (13M)(NOV/DEC2013) (NOV–DEC 2015) (APR-MAY 2017)(MAY/JUNE 2014) (NOV–DEC 2014)**BTL2 **Answer Mike W. Martin pg no 254 and 266** **Computer Ethics: (2 M)** Computer ethics deals with the procedures, values and practices that govern the process of consuming computing technology and its related disciplines without damaging or violating the moral values and beliefs of any individual, organization or entity. In 1991 the Computer Ethics Institute held its first National Computer Ethics Conference in Washington, D.C. The Ten Commandments of Computer Ethics were first presented in Dr. Ramon C. Barquin's paper prepared for the conference, "In Pursuit of a 'Ten Commandments' for Computer Ethics." **The Computer Ethics Institute published them as follows in 1992: (5 M)** • Not use a computer to harm other people. • Shall not interfere with other people's computer work.

	• Thou shall not snoop around in other people's computer files. • Not use a Computer to steal. • Should not use a computer to bear false witness. • Shall not copy or use proprietary software for which you have not paid. • Do not use other people's computer resources without authorization or proper compensation. • Not appropriate other people's intellectual output. • Do think about social consequences of program you are writing or system you are designing. • Shall always use a computer in ways, insure consideration and respect for your fellow humans. • ethics codes of conduct and resources Important unethical act under this categories: (6 M) • Bank robbery • Privacy • Hacking • Computer viruses
8	**Explain the characteristics of moral leader in detail**. **(13 M) (NOV/DEC2013) (MAY/JUNE 2014) (APR/MAY 2015) (NOV/DEC 2014)** BTL2 **Answer : Page: 39 - Mike W. Martin** **Moral Leadership (2 M)** Moral Leadership is a very different kind of leadership. Rather than aspiring to being followed, Moral Leaders aim to serve. Instead of showcasing their own skills, Moral Leaders tend to develop the capacities of others. **CHARACTERISTICS OF MORAL LEADER(11M)** ○ Justice ○ Respect others ○ Honesty ○ Humane ○ Focus on teambuilding ○ Value driven decision-making ○ Encourages initiative ○ Leadership by example ○ Values awareness

	○ No tolerance for ethical violations
9	**Discuss the corporate social responsibility in detail. (MAY/JUNE 2014) (NOV/DEC 2016) (13M)**BTL2 **Answer : Refer notes** **CORPORATE SOCIAL RESPONSIBILITY: (2 M)** Corporate Social Responsibility is the continuing commitment by business to behave ethically and contribute to economic development while improving the quality of life of the workforce and their families as well as of the local community and society at large. **TYPES OF CORPORATE SOCIAL RESPONSIBILITY: (5 M)** ○ Environmental Responsibility ○ Philanthropic Initiatives ○ Ethical Business Practices ○ Economic Responsibility **ADVANTAGES OF CSR: (6 M)** ○ The ability to have positive impact in the community ○ It supports public value outcomes: ○ It supports being an employer of choice: ○ It encourages both professional and personal development ○ It enhances relationships with clients
10	**Explain the problems of defence industry with examples. (13M) (MAY/JUNE 2014) (13M)**BTL2 **Answer: Refer Notes (13 M)** **1.Large military build-ups:** $2 billion cost overrun on the development of C5-A cargo plane reported to the public by Ernest Fitzgerald due to poor operating efficiencies in defence industry. He pointed out how large suppliers felt secure in not complying with cost-cutting plans but small contractors were willing.25% firms hold 50%of all defence contracts and 8 firms conduct 45% of defence research. **2. Technology creep:** The arms are not only growing in size, it is also becoming better. The development of a new missile or one that can target more accurately, by one country, can upset or destabilize a diplomatic negotiation. Sometimes this fad for modernization leads to undesirably consequences. The F15 fighter planes were supposed to be fastest and most manoeuvrable of its kind but most were not available for service due to repairs, defects and lack of spares.

	Engineers should be bewaring of such pitfalls. **3. Impact of secrecy:** Secrecy poses problems to engineers. Engineers should be aware of the answers to the following questions: Should discoveries of significance to military be informed to govt.? Can they be shared with other researchers, in other countries? Should they be withheld from the scientific and public community? **4. Effect on economy:** Every dollar spent on defence produces less jobs than what could be provided for by using the resource on other neglected sectors such as education and road development.
	PART * C
1	**Discuss the various features of multinational corporation. (15M) (APR/MAY2015) (NOV/DEC 2016)** BTL2 **Answer: Refer notes.** **MULTINATIONAL CORPORATION:** Definition: (2 M) A multinational company is a business that operates in many different countries at the same time. In other words, it's a company that has business activities in more than one country. Example: (2 M) The true definition of a multinational company isn't that it manufactures in other countries, however; the true meaning is that the business has operations in multiple countries. This can take form in many different ways besides manufacturing. Take McDonalds for example. They have almost 35,000 restaurants located in 119 countries around the world. This means that not only operate the physical restaurants, they also operate supply chains to deliver the beef and other products required to keep their locations working properly. **Features of Multinational Corporations (MNCs): (11 M)** **Following are the salient features of MNCs:** ▪ Huge Assets and Turnover ▪ International Operations Through a Network of Branches ▪ Unity of Control ▪ Mighty Economic Power ▪ Advanced and Sophisticated Technology ▪ Professional Management ▪ Aggressive Advertising and Marketing ▪ Better Quality of Products

2	**Discuss the ethical issues related to weapon development. (15M) (NOV/DEC2014) (MAY/JUNE 2014) (MAY/JUN 2016) (NOV – DEC 2018)** BTL2 **Answer: Refer notes.** **Introduction: (2 M)** • Military activities including world wars have stimulated growth of technology. • The growth of internet amply illustrates this fact. • The development of warfare and the involvement of engineers bring out many ethical issues concerned with engineers. **Role of Engineers in weapons development: (13 M)** • It gives one job with high salary. • One takes pride and honor in participating in the activities towards the defense of the nation. • Engineers are capable of innovating and developing new weapons. • Many of the rational engineers feel that they cannot work on designing weapons, which are ultimately used to kill human beings. Even though they are not ultimate users of those weapons, they find it morally unacceptable to work on such areas. • One believes the he fights a war on terrorism and thereby contribute to peace and stability of country. • Ironically, the wars have never won peace, only peace can win peace. • By research and development, engineer is reducing or eliminating risk from enemy weapons. • Savings ones country from disaster. • By building up arsenals, show of force, a country can force rough country, towards regulation. • Engineers can participate effectively in arms control negotiation for surrender or peace • Bombing of Nagasaki and Hiroshima led to surrender by the Japanese in 1945. • Many engineers had to fight and convince their personal conscience. • Engineers must have the potential judgments to serve in defense works that would jeopardize the human community.
3	**Explain the advantages and disadvantages of multinational corporation. (15M) (NOV/DEC 2016)**BTL2 **Answer: Page: 155 - Mike W. Martin** **Advantages of MNCs : (8 M)** ▪ Employment Generation:

- Automatic Inflow of Foreign Capital:
- Proper Use of Idle Resources:
- Improvement in Balance of Payment Position:
- Technical Development:
- Managerial Development:
- End of Local Monopolies:
- Improvement in Standard of Living:
- Promotion of international brotherhood and culture:

Limitations of MNCs : **(7 M)**

- Danger for Domestic Industries:
- Repatriation of Profits:
- No Benefit to Poor People:
- Danger to Independence:
- Disregard of the National Interests of the Host Country:
- Misuse of Mighty Status:
- Careless Exploitation of Natural Resources:
- Selfish Promotion of Alien Culture:
- Exploitation of People, in a Systematic Manner

CS6004 CYBER FORENSICS LTPC 3 0 0 3

OBJECTIVES:

The student should be made to:

* Learn the security issues network layer and transport layer..
* Be exposed to security issues of the application layer.
* Learn computer forensics.
* Be familiar with forensics tools.

UNIT I NETWORK LAYER SECURITY &TRANSPORT LAYER SECURITY 9

IPSec Protocol - IP Authentication Header - IP ESP - Key Management Protocol for IPSec.Transport layer Security: SSL protocol, Cryptographic Computations – TLS Protocol.

UNIT II E-MAIL SECURITY & FIREWALLS 9

PGP - S/MIME - Internet Firewalls for Trusted System: Roles of Firewalls – Firewall related terminology- Types of Firewalls - Firewall designs - SET for E-Commerce Transactions.

UNIT III INTRODUCTION TO COMPUTER FORENSICS 9

Introduction to Traditional Computer Crime, Traditional problems associated with Computer Crime. Introduction to Identity Theft & Identity Fraud. Types of CF techniques - Incident and incident response methodology - Forensic duplication and investigation. Preparation for IR: Creating response tool kit and IR team. - Forensics Technology and Systems - Understanding Computer Investigation – Data Acquisition.

UNIT IV EVIDENCE COLLECTION AND FORENSICS TOOLS 9

Processing Crime and Incident Scenes – Working with Windows and DOS Systems. Current Computer Forensics Tools: Software/ Hardware Tools.

UNIT V ANALYSIS AND VALIDATION 9

Validating Forensics Data – Data Hiding Techniques – Performing Remote Acquisition – Network Forensics – Email Investigations – Cell Phone and Mobile Devices Forensics.

TOTAL: 45

PERIODS OUTCOMES: Upon completion of the course, the student should be able to:

- Discuss the security issues network layer and transport layer.
- Apply security principles in the application layer.
- Explain computer forensics.
- Use forensics tools.
- Analyze and validate forensics data.

TEXT BOOKS: 1. Man Young Rhee, "Internet Security: Cryptographic Principles", "Algorithms and Protocols", Wiley Publications, 2003. 2. Nelson, Phillips, Enfinger, Steuart, "Computer Forensics and Investigations", Cengage Learning, India Edition, 2008.

REFERENCES: 1. John R.Vacca, "Computer Forensics", Cengage Learning, 2005 2. Richard E.Smith, "Internet Cryptography", 3rd Edition Pearson Education, 2008. 3. Marjie T.Britz, "Computer Forensics and Cyber Crime": An Introduction", 3rd Edition, Prentice Hall, 2013.

Subject Code: CS6004 **Year/Semester: IV/08**

Subject Name: Cyber Forencics **Subject Handler: Ms.Sonia Jenifer Rayen**

UNIT I- NETWORK LAYER SECURITY &TRANSPORT LAYER SECURITY

IPSec Protocol - IP Authentication Header - IP ESP - Key Management Protocol for IPSec.Transport layer Security: SSL protocol, Cryptographic Computations – TLS Protocol

PART* A

Q.N O	QUESTIONS
1.	**Specify the four categories of security threats.** BTL3 ✓Interruption ✓Interception ✓Modification ✓Fabrication
2	**List the limitations of SMTP/RFC 822.** BTL1 • SMTP cannot transmit executable files or binary objects. • It cannot transmit text data containing national language characters. • SMTP servers may reject mail message over certain size. • SMTP gateways cause problems while transmitting ASCII and EBCDIC. • SMTP gateways to X.400 E-mail network cannot handle non textual data included in X.400 messages.
3	**Define S/MIME.** BTL2 Secure/Multipurpose Internet Mail Extension(S/MIME) is a security enhancement to the MIME Internet E-mail format standard, based on technology from RSA Data Security.
4	**What are the different between SSL version 3 and TLS?** BTL1

SSL	TLS
In SSL the minor version is 0 and major version is 3	In TLS, the major version is 3 and the minor version is 1
SSL use HMAC alg., except that the padding bytes concatenation	TLS makes use of the same alg
SSL supports 12 various alert codes	TLS supports all of the alert codes defined in SSL3 with the exception of no certificate

5	**What are the services provided by PGP services?** BTL1 • Digital signature • Message encryption

	• Compression • E-mail compatibility • Segmentation
6	**Why E-mail compatibility function in PGP needed?** BTL2 Electronic mail systems only permit the use of blocks consisting of ASCII text. To accommodate this restriction PGP provides the service converting the row 8-bit binary stream to a stream of printable ASCII characters. The scheme used for this purpose is Radix-64 conversion
7	**Name any cryptographic keys used in PGP.** BTL3 ✓One-time session conventional keys. ✓Public keys. ✓Private keys. ✓Pass phrase based conventional keys.
8	**Define S/MIME .**BTL1 Secure / Multipurpose Internet Mail Extension(S/MIME) is a security enhancement to the MIME internet E-mail format standard, based on technology from RSA Data security.
9	**What are the services provided by PGP services?** BTL2 ✓ Digital signature ✓ Compression ✓ Segmentation ✓ Message encryption ✓ E-mail compatibility
10	**Name any cryptographic keys used in PGP.** BTL3 ✓ One time session conventional keys ✓ Public keys ✓ Private keys ✓ Pass phrase based conventional keys.
11	**What is security association?** BTL2 A security association (SA) is the establishment of shared security attributes between two network entities to support secure communication.
12	**What does Internet key management in IPSec?** BTL2 Internet key exchange (IKE) is a key management protocol standard used in conjunction with the Internet Protocol Security (IPSec) standard protocol. It provides security for Virtual Private Networks (VPNs) negotiations and network access to random hosts.
13	**List out the IKE hybrid protocol dependence.** BTL1 ✓ISAKMP - Internet Security Association and Key Management Protocols. ✓Oakley
14	**What does IKE hybrid protocol mean?** BTL2 Internet Key Exchange (IKE) is a key management protocol standard used in conjunction with the internet protocol security (IPSec) standard protocol. It provides security for Virtual Private Networks (VPNs) negotiations and network access to random hosts.

15	**What are the two security services provided by IPSec?** BTL2 ✓ Authentication Header (AH) ✓ Encapsulating Security Payload (ESP).
16	**What are the fields available in AH header?** BTL2 ✓ Next header ✓ Payload length ✓ Reserved ✓ Security parameter ✓ Sequence number Integrity check value
17	**What is virtual private network?** BTL2 VPN means virtual private network, a secure tunnel between two devices.
18	**What is ESP?** BTL2 ESP-encapsulating security payload provides authentication, integrity and confidentiality, which protect against data tempering and provide message content protection
19	**What is Behavior-Blocking Software (BBS)?** BTL2 BBS integrates with the OS of a host computer and monitors program behavior in real time for malicious actions.
20	**List password selection strategies.** BTL1 ✓ User education ✓ Reactive password checking ✓ Computer-generated password. ✓ Proactive password checking.

	Part * B
1	**Explain about Email Security. (13M)** BTL4 **Answer : Page : 591 – William Stallings** ✓Modes of Operation Authentication Confidentiality Compression e-mail compatibility (2M) ✓Tunnel mode It provides the protection to the entire IP Packet (1M) ✓Transport mode It provides protection primarily for upper layer protocols (1M) ✓Internet key exchange protocol Manual

	Automated (2M) ✓Security Association It provides a framework for internet key management and provides the specific protocol support including formats (1M) ✓Contents of SAD ✓It represent a specification of security services offered to traffic carried through a in-directional channel from one node to another (1M) ✓Authentication Header ✓It is used to provide connectionless integrity and data origin authentication for IP datagrams (1M) ✓Authentication Header fields (1M) Access control Connectionless integrity Data origin authentication Confidentiality ✓Anti Replay Attacks It is a sub protocol of IPsec that is part of Internet engineering task force. The main goal is to avoid hackers injecting or making changes in packets that travel from a source to destination (1M) ✓Values in sliding window (2M)
2	**Explain in detail about IPSEC. (13M)** BTL4 **Answer : Page : 640 – William Stallings** ✓IP v4 Specifies an IPv4 address or range of addresses that are authorized senders for a domain (2M) ✓IP v6 Specifies an IPv6 address or range of addresses that are authorized senders for a domain. (2M) ✓AH tunnel modes It authenticates the entire inner IP packet selected portion of outer IP header (1M) ✓IP header

An IP header is header information at the beginning of an IP packet which contains information about IP version, source IP address, destination IP address, time-to-live (2M)

✓New IP header (1M)

✓TCP header

TCP is the primary transport protocol used to provide reliable, full-duplex connections. The most common use of TCP is to exchange TCP data encapsulated in an IP datagram. (2M)

✓Original data

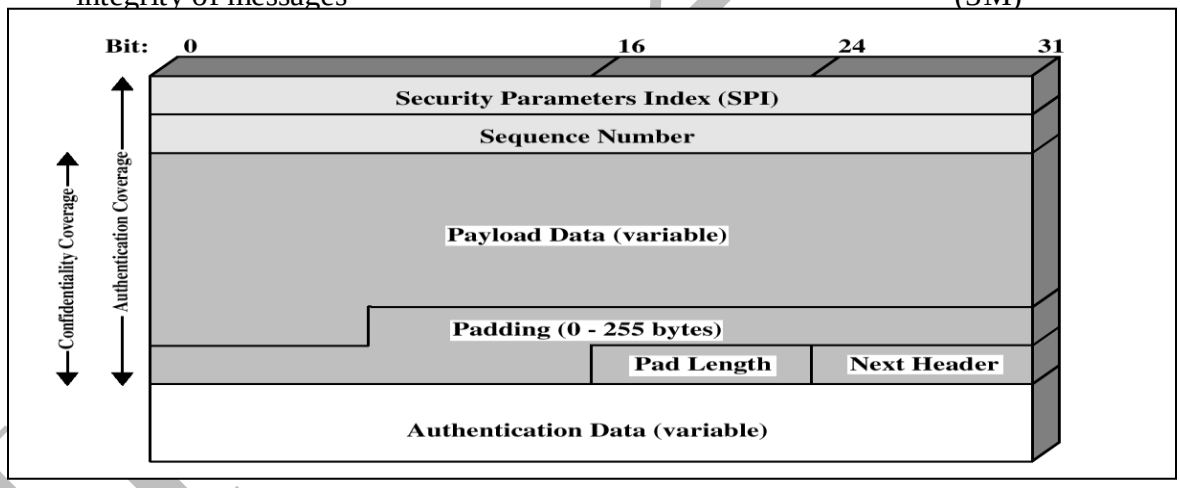
It refers to any data object that hasn't undergone thorough processing, either manually or through automated computer software. (2M)

✓Original IP header (1M)

3 **Explain Encapsulating security payload. (13M)** BTL4

Answer : Page : 651 – William Stallings

✓ESP consists of an encapsulating header and trailer used to provide encryption or combined encryption/ authentication. The current specification is RFC 4303, IP Encapsulating Security Payload (ESP).The purpose is to provide confidentiality and integrity of messages (3M)



✓ESP Transport mode (1M)

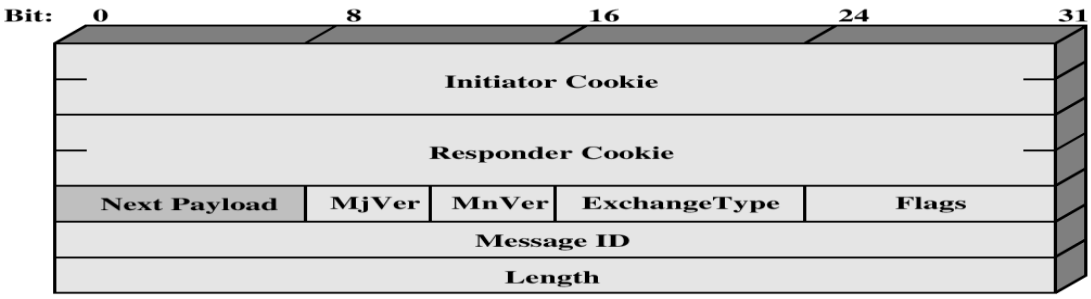
Transport mode ESP is used to encrypt and optionally authenticate the data carried by IP

✓Operation of ESP Transport mode (4M)

✓ESP tunnel mode

Tunnel mode ESP is used to encrypt an entire IP packet. For this mode, the ESP header is prefixed to the packet and then the packet plus the ESP trailer is encrypted. This method can be used to counter traffic analysis (1M)

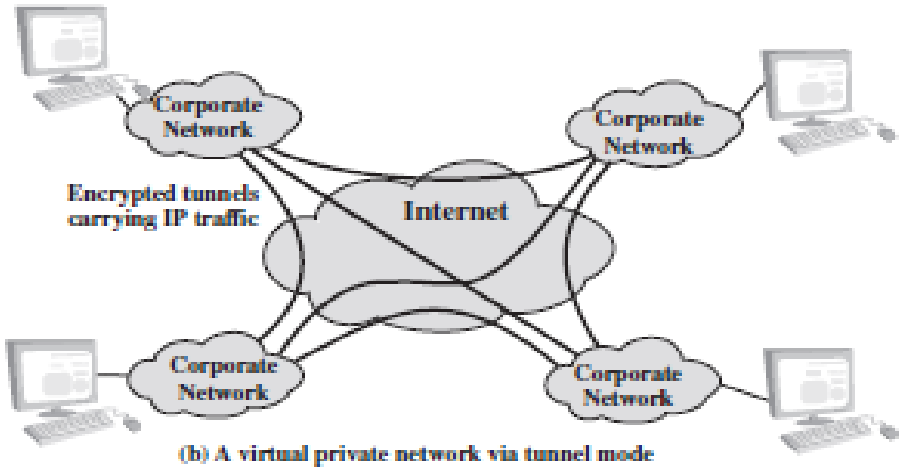
✓Operation of ESP tunnel mode (4M)



(a) ISAKMP Header

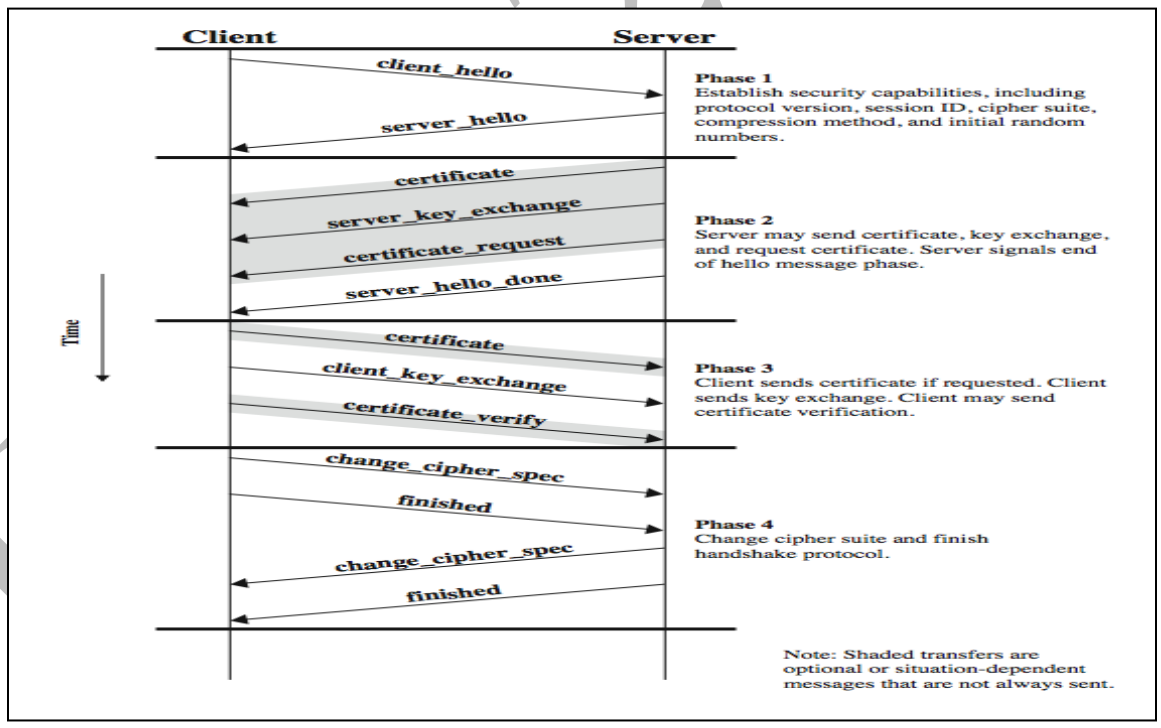
(b) Generic Payload Header

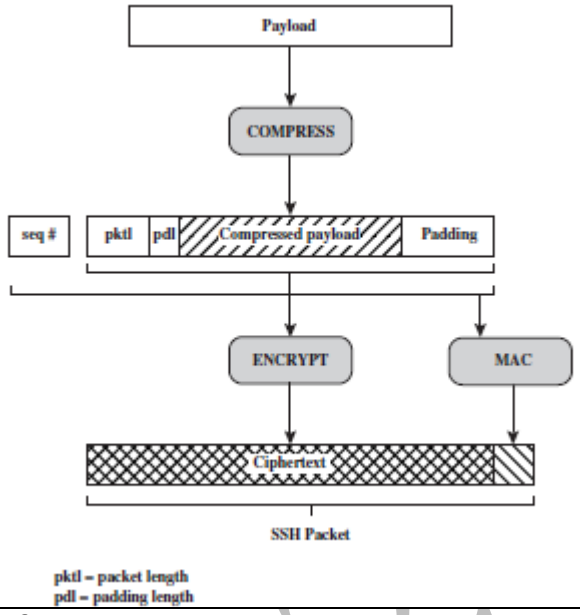
(a) Transport-level security

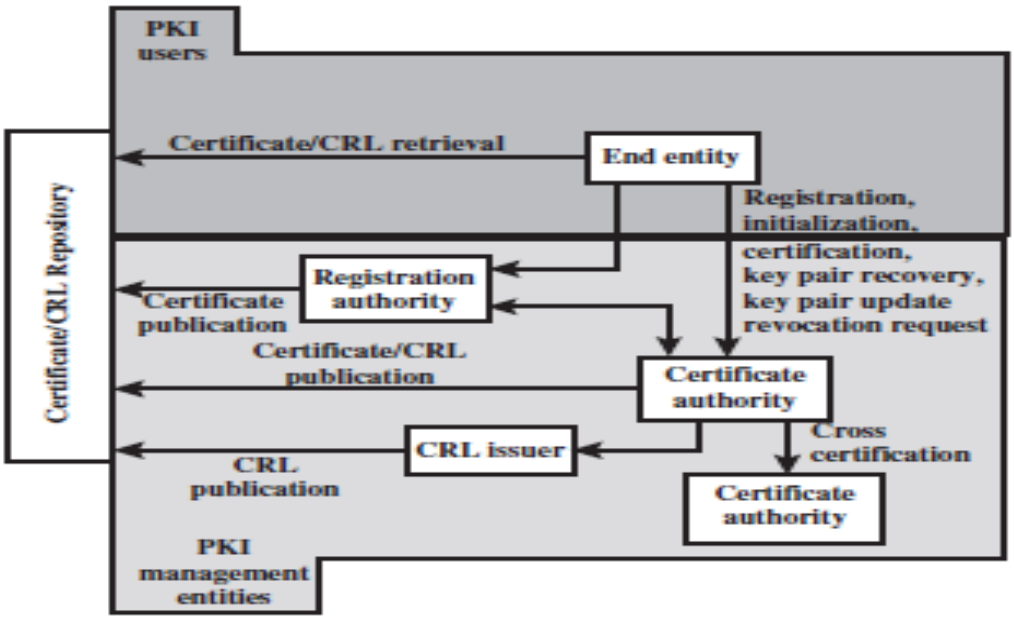


(b) A virtual private network via tunnel mode

4	**Explain Internet security Association and Key Management Protocol. (13M)** BTL4 **Answer : Page : 663 – William Stallings** ✓Procedures and formats for establishing maintaining and deleting Security Association information (1M) ✓IP Seckey management (2M) ✓Initiator cookie (1M)

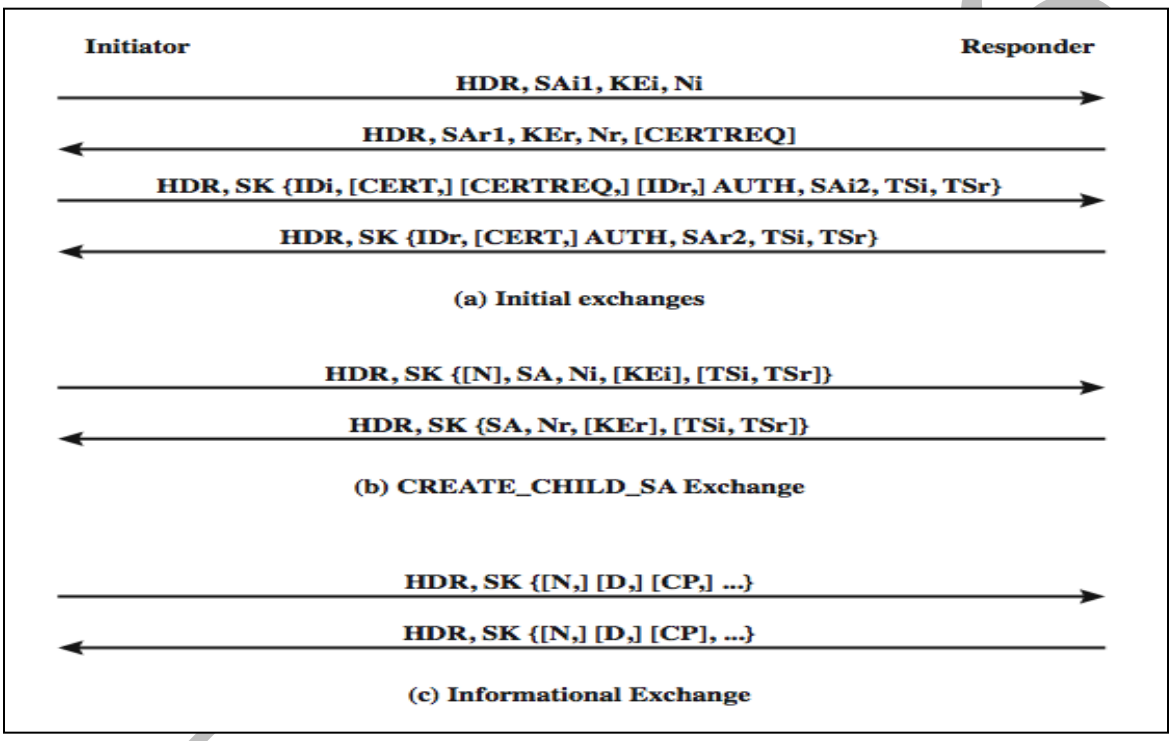
	✓Responder cookie (1M) ✓Major and minor version (3M) ✓Message ID (1M) ✓Length (1M) ✓Payloads (2M) ✓Exchange types (1M)
5	**Explain about WEB security. (13M)** BTL4 **(Apr/May 2011, Nov/Dec 2011, Nov/Dec 13, May/June 2015)** **Answer : Page : 510 – William Stallings** ✓Secure socket layer It is the standard security technology for establishing an encrypted link between a web server and a browser. This link ensures that all data passed between the web server and browsers remain private and integral. (2M) ✓How SSL works After connection is made, the session key is used to encrypt all transmitted data. Browser connecte to a web serer secured with SSL and request the server identity. Server sends a copy of its SSL certificate (2M) ✓Handshake protocol (2M)  ✓Change cipher spec protocol (1M) ✓Record protocol (1M) ✓Alert protocol (1M) ✓Fatal alerts (2M) ✓Transport layer security (2M)

	Definition Architecture Parameter Architecture Diagram 
6	**Explain public key infrastructure. (13M)** BTL4 **(Nov/Dec 2013)** **Answer : Page : 515 – William Stallings** ✓It is a model for creating, distributing and revoking certificates based on X.509. A set of policies, processes, server platforms, software and workstations used for the purpose of administering certificates and public-private key pairs, including the ability to issue, maintain, and revoke public key certificates (1M) ✓End entity A generic term used to denote end users, devices (e.g., servers, routers), or any other entity that can be identified in the subject field of a public-key certificate. End entities typically consume and/or support PKIrelated services (1M) ✓Certification authority The issuer of certificates and (usually) certificate revocation lists (CRLs). It may also support a variety of administrative functions, although these are often delegated to one or more Registration Authorities. (2M) ✓Registration authority An optional component that can assume a number of administrative functions from the CA. The RA is often associated with the end entity registration process but can assist in a number of other areas as well. (2M) ✓CRI issuer

	An optional component that a CA can delegate to publish CRLs (1M) ✓Repository A generic term used to denote any method for storing certificates and CRLs so that they can be retrieved by end entities. (1M) ✓PKI Architecture – Diagram (2M)  ✓PKI management functions (2M) Registration Initialization Certification Key pair recovery Key pair update Revocation request Cross certification ✓PKI management protocols (1M)

	PART * C
1	**Explain E-mail security. (15M)** BTL4 **Answer : Page : 591 – William Stallings**

	✓Security Services for E-mail	(2M)
	✓Possible Attacks through E-mail	(2M)
	✓Establishing Keys privacy	(2M)
	✓Authentication of source	(2M)
	✓Message Integrity	(2M)
	✓NonRepudiation	(1M)
	✓PGP	(2M)
	✓S/MIME	(2M)
2	**Explain IP Security. (15M)** BTL4 **Answer : Page : 639 – William Stallings**	
	✓Security policy Security Parameters Index (SPI) IP Destination Address Security Protocol Identifier	(3M)
	✓Encapsulating security payload Diagram Format Algorithm	(3M)
	✓Internet key exchange Manual Automated OKDP ISAKMP	(3M)
	✓Cryptographic suites ESP encryption ESP integrity IKE encryption IKE PRF IKE Integrity IKE DH group	(3M)
	✓Diagrams	(3M)


Initiator
Responder
HDR, SAi1, KEi, Ni
HDR, SAr1, KEr, Nr, [CERTREQ]
HDR, SK {IDi, [CERT,] [CERTREQ,] [IDr,] AUTH, SAi2, TSi, TSr}
HDR, SK {IDr, [CERT,] AUTH, SAr2, TSi, TSr}
(a) Initial exchanges
HDR, SK {[N], SA, Ni, [KEi], [TSi, TSr]}
HDR, SK {SA, Nr, [KEr], [TSi, TSr]}
(b) CREATE_CHILD_SA Exchange
HDR, SK {[N,] [D,] [CP,] ...}
HDR, SK {[N,] [D,] [CP], ...}
(c) Informational Exchange

UNIT 2- E-MAIL SECURITY & FIREWALLS

PGP - S/MIME - Internet Firewalls for Trusted System: Roles of Firewalls – Firewall related terminology- Types of Firewalls - Firewall designs - SET for E-Commerce Transactions.

PART* A

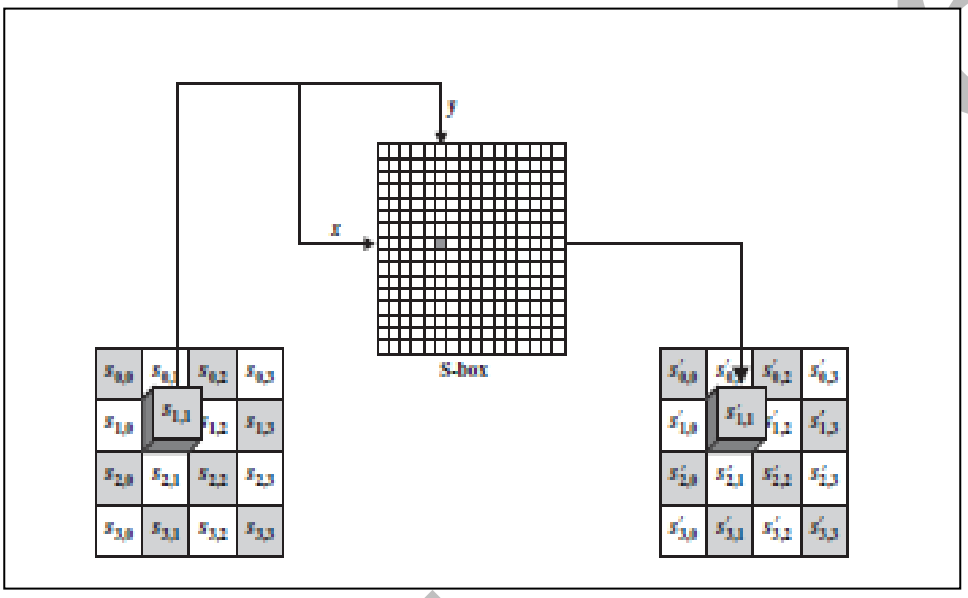
1	**Compare stream cipher with block cipher with example.**BTL1 **Stream cipher:** Processes the input stream continuously and producing one element at a time. **Example: caeser cipher**. **Block cipher:** Processes the input one block of elements at a time producing an output block for each input block. **Example: DES**
2	**Differentiate unconditionally secured and computationally secured .**BTL1 An Encryption algorithm is unconditionally secured means; the condition is if the cipher text generated by the encryption scheme doesn't contain enough information to determine corresponding plaintext. Encryption is computationally secured means, ✓ The cost of breaking the cipher exceeds the value of enough information. ✓ Time required to break the cipher exceed the useful lifetime of information.
3	**What are the design parameters of Feistel cipher network?** BTL1 ✓Block size ✓Key size ✓Number of rounds ✓Sub key generation algorithm ✓Round function ✓Fast software encryption / decryption ✓Ease of analysis
4	**Define Product cipher.** BTL1 Product Cipher means two or more basic cipher are combined together and produces the resultant cipher which is called the 'product cipher'.
5	**Explain Avalanche effect.** BTL1 A desirable property of any encryption algorithm is that a small change in either the plaintext or the key produce a significant change in the ciphertext

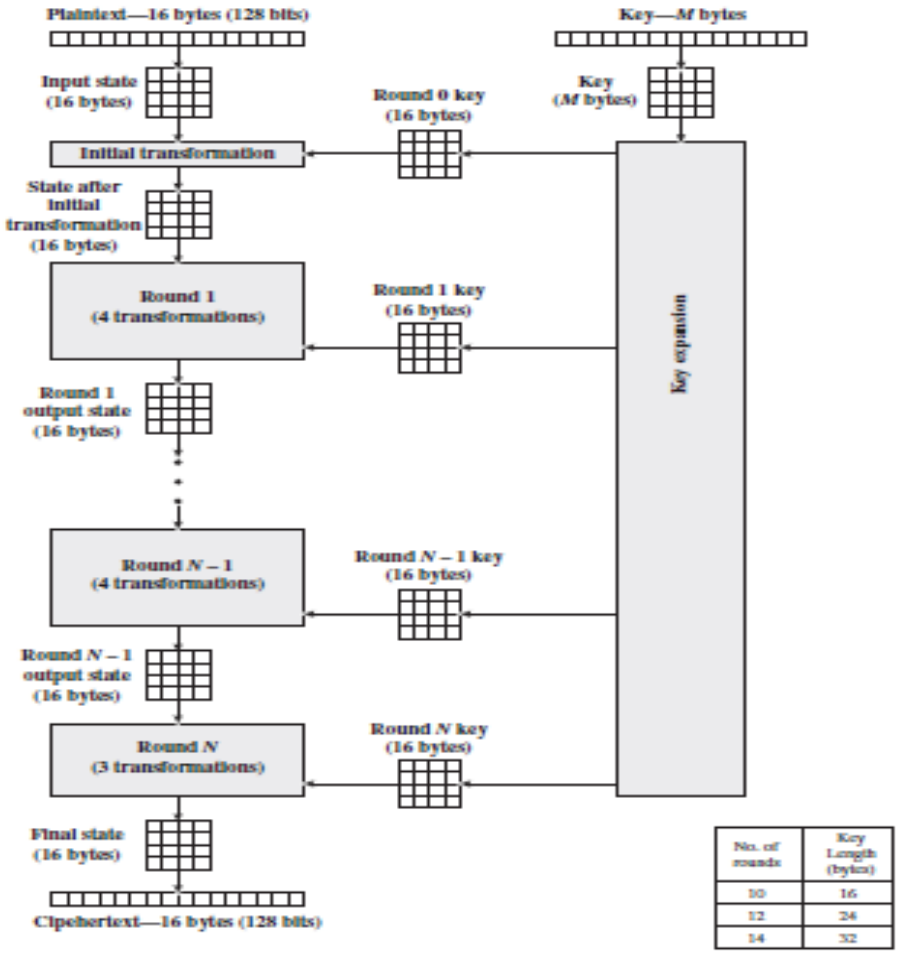
6	**Define Diffusion & Confusion.** BTL1 **Diffusion:** ✓In **diffusion**, the statistical structure of the plaintext is dissipated into long-range statistics of the ciphertext. ✓This is achieved by having each plaintext digit affect the value of manyciphertext digits; generally, this is equivalent to having each ciphertext digit beaffected by many plaintext digits **Confusion:** It can be achieved by substitution algorithm. It is the relationship between cipher text and key.
7	**Give the five modes of operation of Block cipher.** BTL2 ✓ Electronic Codebook(ECB) ✓ Cipher Block Chaining(CBC) ✓ Cipher Feedback(CFB) ✓ Output Feedback(OFB) ✓ Counter(CTR)
8	**State advantages of counter mode.** BTL2 ✓Hardware efficiency ✓Software efficiency ✓Preprocessing ✓Random access ✓Provable security ✓Simplicity
9	**Define Multiple Encryption** BTL2 Multiple Encryption is a technique in which the encryption is used multiple times. Eg: Double DES, Triple DES
10	**Specify the design criteria of block cipher.** BTL4 ✓ Number of rounds ✓ Design of the function F ✓Key scheduling
11	**Define Reversible mapping.** BTL5 Each plain text is maps with the unique cipher text. This transformation is called reversible mapping
12	**Specify the basic task for defining a security service.** BTL6 A service that enhances the security of the data processing systems and the information transfer of an organization. The services are intended to counter security attack, and they make use of one or more security mechanism to provide the service.
13	**What are the difference between link and end to end encryption?** BTL2

Link Encryption	**End to End Encryption**
✓With link encryption, each vulnerable communication link is equipped on both ends	✓With end to end ncryption, encryption process is carried out at the two end systems

	with an encryption device	
	✓Message exposed in sending host and in intermediate nodes	✓Message encrypted in sending and intermediate nodes
	✓Transperant to user	✓User applies encryption
	✓Host maintains encryption facility	✓Users must determine algorithm
	✓One facility for all users	✓Users selects encryption scheme
14	**What is traffic Padding? What is its purpose?** BTL2 Traffic padding produces ciphertext output continuously, the purpose of padding is that even in the absence of the plain text, a continuous random data stream is generated.	
15	**List the evaluation criteria defined by NIST for AES?** BTL5 The evaluation criteria for AES is as follows: ✓Security ✓Cost ✓Algorithm and implementation characteristics	
16	**What is Triple Encryption? How many keys are used in triple encryption?** BTL4 Triple Encryption is a technique in which encryption algorithm is performed three times using three keys.	
17	**List the schemes for the distribution of public keys.** BTL3 ✓ Public announcement ✓ Publicly available directory ✓ Public key authority ✓ Public key certificates	
18	**Drawback of 3-DES.** BTL3 ✓Algorithm is sluggish in software ✓ The number of rounds in thrice as that of DES ✓ 3DES uses 64 bit block size ✓To have higher efficiency and security a larger block size is needed.	
19	**List out an evaluation criteria for round 2.** BTL1 ✓ General security ✓ Software implementation ✓ Hardware implementation ✓ Attacks ✓ Encryption Vs Decryption ✓ Key ability-Ability to change keys quickly with minimum of resources.	
20	**List out the attacks to RSA.** BTL2 ✓ **Brute force** - Trying all possible private keys. ✓ **Mathematical attacks** - The approaches to factor the product of two prime numbers. ✓**Timing attack** - Depends on the running time of the decryption algorithm	

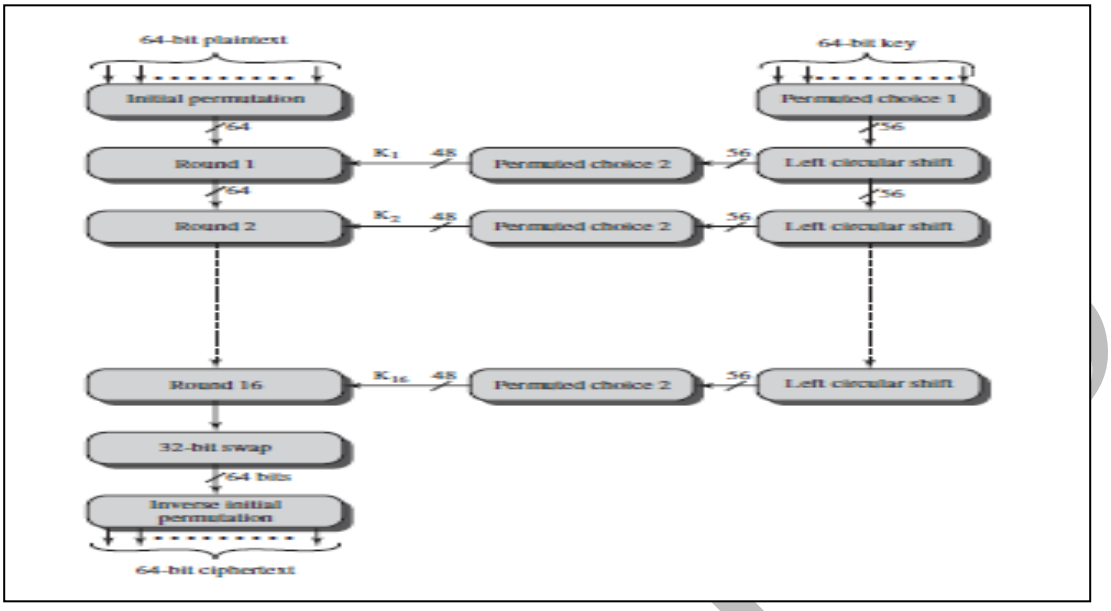
21	**What is Primality Test? List the types of Primality Testing.** BTL1 A primality test is an algorithm for determining whether an input number is prime or not. Types of Primality Test: Fermat Primality Test. Miller-Rabin Primality Test. Solovay-strassenPrimality Test.
22	**What is Factoring ?**BTL1 Factoring is the decomposition of an object into a product of other objects, or factors, which when multiplied together give the original.
23	**Define RC4.** BTL2 RC4 is a stream cipher designed in 1987 by Ron Rivest for RSA Security. RC4 is used in the SSL/TLS (Secure Sockets Layer/Transport Layer Security) standards that have been defined for communication between Web browsers and servers. It is also used in the WEP (Wired Equivalent Privacy) protocol and the newer WiFi Protected Access (WPA) protocol that are part of the IEEE 802.11 wireless LAN standard.
24	**What is the meet in the middle attack?** BTL1 This is the cryptanalytic attack that attempts to find the value in each of the range and domain of the composition of two functions such that the forward mapping of one through the first function is the same as the inverse image of the other through the second function-quite literally meeting in the middle of the composed function.
25.	**List Four possible approaches to attack the RSA Algorithm.** BTL2 Brute Force Mathematical Attacks Timing attacks Chosen Cipher text attacks

	PART * B
1	**Explain Block cipher design principles and modes of operation. (Apr/May2014) (13M)** BTL4 **Answer:Pageno.:116 to 118 in William Stallings** ✓DES Design criteria (2M) ✓Criteria for permutation(2M) ✓Number of rounds(2M) ✓S-Box design Diagram(2M)  ✓Key schedule algorithm(2M) ✓Electronic code book(2M) ✓Cipher block chaining(1M)
2	**Explain about Advance Encryption Standard. (13M)** BTL4 **Answer:Page no.:174 to 176 in William Stallings** ✓Evaluation criteria for AES (2M) ✓Security(1M) ✓Cost(1M) ✓Implementation(1M) ✓AES cipher(2M) ✓AES Encryption and decryption(2M)

	 No. of rounds: 10, 12, 14 Key Length (bytes): 16, 24, 32 ✓Inverse substitution bytes(1M) ✓Mix column(1M) ✓ Key expansion in AES 192 and AES 256 (2M)
3	**Explain Triple DES. (13M)**BTL4 **Answer:Pageno.:101 to 103 in William Stallings** ✓Triple DES with 2 keys(3M) ✓Diagram with formulas(4M) $C = E(K_1, D(K_2, E(K_1, P)))$ $P = D(K_1, E(K_2, D(K_1, C)))$ ✓Triple DES with 3 keys(4M) ✓Diagram with operation formulas(2M) $C = E(K_3, D(K_2, E(K_1, P)))$
4	**Explain about RC4 algorithm. (13M)** BTL4 **(May/June/2012)** **Answer:Page no.PPT given covering all topics**

	✓Explain RC4 algorithm (2M) ✓Parameters (2M) ✓Primitive operators(1M) ✓Characteristics(1M) ✓Key expansion(2M) ✓Encryption(1M) ✓Decryption(1M) ✓RC4 modes (3M)
5	**Explain public key algorithm. (13M)** BTL4 **Answer:Page no.:293 to 295 in William Stallings** ✓Public key algorithm(2M) ✓Characteristics of public key cryptography(2M) ✓Six ingredients(3M) ✓Decryption algorithm diagram(2M) ✓Steps to create public key(2M) ✓Diagrammatical representation(2M)
6	**i)Explain RSA algorithm. (6M)** BTL4 **(Apr/May 2011,Nov/Dec 2011,2012)** **Answer:Page no.:301 to 309 in William Stallings** ✓Explain the process in mathematical fact(2M) ✓Choose, select, encrypt, transfer cipher text, decrypt.(3M) ✓Discuss with an example(1M) **ii)Explain blowfish encryption algorithm. (7M)** BTL4 **Answer:Page no.:119 to 120 in William Stallings** ✓Algorithm(1M) ✓Feistel network(3M) ✓Working methodology(2M) ✓Example with diagram(1M)
7	**Explain Diffie Hellman key exchange. (13M)** BTL4 **Answer:Page no.:325 to 327 in William Stallings** ✓Key management techniques(3M) ✓Explain Diffie Hellman algorithm with steps (3M) ✓Provide diagrammatical explanation with example(4M) ✓Process explanation with steps and diagram(3M)
8	**Explain Elliptical Curve cryptography. (13M)** BTL4 **Answer:Page no.:341 to 343 in William Stallings** ✓Elliptical curve over Zp(4M)

	✓Equation of elliptical curve over Zp(3M) ✓Elliptic curves over GF(2m) (3M) ✓Elliptic curve cryptography(3M)
	PART * C
1	**Explain block cipher principles and modes of operation. (15M)** BTL4 **Answer:Page no.:216 to 218 in William Stallings** ✓DES design (3M) ✓CBC mode (3M) ✓AES (3M) ✓Triple DES (3M) ✓RC 5 Algorithm(3M)
2	**Explain Public Key cryptography. (15M)** BTL4 **Answer:Page no.:290 to 292 in William Stallings** ✓Public Key Cryptography (2M) **Public-key cryptography**, or **asymmetric cryptography**, is any cryptographic system that uses pairs of keys: *public keys* which may be disseminated widely, and *private keys* which are known only to the owner ✓Characteristics (3M) ✓Six ingredients with explanation (5M) ✓Diagrams (2M) ✓Steps (3M)
3	**Explain DES in detail. (15M)** BTL4 **Answer:Pageno.**:101 to 108 in William Stallings ✓Definition (3M) **DES** key length and brute-force attacks. The Data Encryption Standard is a block cipher, **meaning** a cryptographic key and algorithm are applied to a block of data simultaneously rather than one bit at a time ✓Structure (6M) ✓Diagrams (6M)

	
4	**Evaluate encryption and decryption using RSA algorithm for the following. p=7, q=11; e=17; m=8. (15M)** BTL6 **Answer:Page no.:247 to 249 in William Stallings** ✓computing their system modulus N=p.q (2M) ✓note ø(N)=(p-1)(q-1) ✓STEPS(3M) ✓to encrypt a message M the sender: ✓obtains public key of recipient KU={e,N} ✓computes: $C=M^e \bmod N$, where $0 \leq M < N$ ✓to decrypt the ciphertext C the owner: ✓ uses their private key KR={d,p,q} ✓computes: $M=C^d \bmod N$ ✓Encryption(5M) ✓Decryption(5M)
5	**Evaluate using Diffie-Hellman key exchange technique. Users A and B use a Common prime q=11 and a primitive root alpha=7.** **(i) If user A has private key XA=3.What is A's public key YA?** **(ii)If user B has private key XB=6. What is B's public key YB?** **(iii) What is the shared secret key? Also write the algorithm. (15M)** BTL6 **Answer:Page no.:208 to 211in William Stallings** ✓prime *p*, element $g \in Z_p^*$ (5M) $h_A = g^x \bmod p$ $h_B = g^y \bmod p$ ✓Encryption(5M) ✓Decryption(5M)

6	**Estimate the encryption and decryption values for the RSA algorithm parameters. P=3, Q=11, E=7, d=?, M=5. (15M)** BTL6 **Answer:Page no.:247 to 249 in William Stallings** ✓computing their system modulus N=p.q (2M) ✓note ø(N)=(p-1)(q-1) ✓STEPS(3M) ✓to encrypt a message M the sender: ✓obtains public key of recipient KU={e,N} ✓computes: $C=M^e \bmod N$, where $0 \leq M < N$ ✓to decrypt the ciphertext C the owner: ✓ uses their private key KR={d,p,q} ✓computes: $M=C^d \bmod N$ ✓Encryption(5M) ✓Decryption(5M)
7	**Implement RSA Algorithm for the given values; trace the sequence of calculations in RSA. P=7,q=13,e=5 and M=10. (15M)** BTL5 **Answer:Page no.:247 to 248 in William Stallings** ✓computing their system modulus N=p.q (2M) ✓note ø(N)=(p-1)(q-1) ✓STEPS(3M) ✓to encrypt a message M the sender: ✓obtains public key of recipient KU={e,N} ✓computes: $C=M^e \bmod N$, where $0 \leq M < N$ ✓to decrypt the ciphertext C the owner: ✓ uses their private key KR={d,p,q} ✓computes: $M=C^d \bmod N$ ✓Encryption(5M) ✓Decryption(5M)
8	**Users Alice and Bob use the Diffie Hellman Key exchange technique with a common prime q=83 and primitive root** $\alpha = 5$**.** **i)if Alice has a private key X_A=6,what is the Alice's public key Y_A?** **ii)If Bob has a private key XB=10, what is Bob's public key Y_B?** **iii)what is the shared secret key? (15M)** BTL6 **Answer:Page no.:325 to 329 in William Stallings** ✓prime *p*, element $g \in Z_p^*$ (5M) $h_A = g^x \bmod p$ $h_B = g^y \bmod p$ ✓Encryption(5M) ✓Decryption(5M)

UNIT 3- INTRODUCTION TO COMPUTER FORENSICS

Introduction to Traditional Computer Crime, Traditional problems associated with Computer Crime. Introduction to Identity Theft & Identity Fraud. Types of CF techniques - Incident and incident response methodology - Forensic duplication and investigation. Preparation for IR: Creating response tool kit and IR team. - Forensics Technology and Systems - Understanding Computer Investigation – Data Acquisition

PART * A

1	**What is message authentication?** BTL1 It is a procedure that verifies whether the received message comes from assigned source has not been altered. It uses message authentication codes, hash algorithms to authenticate the message
2	**Define the classes of message authentication function.** BTL1 Message encryption: The entire cipher text would be used for authentication. Message Authentication Code: It is a function of message and secret key produce a fixed length value Hash function: Some function that map a message of any length to fixed length which serves as authentication
3	**What are the requirements for message authentication?** BTL1 The requirements for message authentication are ✓Disclosure ✓Traffic analaysis ✓Content modification ✓Sequence modification ✓Masquerade ✓Timing modification ✓Source repudiation ✓Destination repudiation
4	**What do you mean by hash function?** BTL4 Hash function accept a variable size message M as input and produces a fixed size hash code H(M) called as message digest as output. It is the variation on the message authentication code
5	**Differentiate MAC and Hash function.** BTL3 MAC: In Message Authentication Code, the secret key shared by sender and receiver. The MAC is appended to the message at the source at a time which the message is assumed or known to be correct. Hash Function: The hash value is appended to the message at the source at time when the message is assumed or known to be correct. The hash function itself not considered to be secret

6	**Give any three hash algorithm.** BTL4 ✓MD5 (Message Digest version 5) algorithm. ✓SHA_1 (Secure Hash Algorithm). ✓RIPEMD_160 algorithm.
7	**What are the requirements of the hash function?** BTL3 ✓ H can be applied to a block of data of any size. ✓ H produces a fixed length output. ✓ H(x) is relatively easy to compute for any given x, making both hardware and software implementations practical.
8	**What do you mean by MAC?** BTL3 MAC is Message Authentication Code. It is a function of message and secret key which produce a fixed length value called as MAC. MAC = $C_k(M)$ Where M = variable length message K = secret key shared by sender and receiver. CK(M) = fixed length authenticator.
9	**Differentiate internal and external error control**. BTL3 **Internal error control:** In internal error control, an error detecting code also known as frame check sequence or checksum. **External error control:** In external error control, error detecting codes are appended after encryption.
10	**What is the meet in the middle attack?** BTL2 This is the cryptanalytic attack that attempts to find the value in each of the range and domain of the composition of two functions such that the forward mapping of one through the first function is the same as the inverse image of the other through the second function-quite literally meeting in the middle of the composed function.
11	**What is the role of compression function in hash function?** BTL2 The hash algorithm involves repeated use of a compression function f, that takes two inputs and produce a n-bit output. At the start of hashing the chaining variable has an initial value that is specified as part of the algorithm. The final value of the chaining variable is the hash value usually b>n; hence the term compression.
12	**What is the difference between weak and strong collision resistance?** BTL2

Weak collision resistance	**Strong resistance collision**
For any given block x, it is computationally infeasible to fine y≠x wit H(y)=H(x). It is proportional to 2^n	It is computationally infeasible to find any pair (x,y) such that H(x)=H(y). It is proportional to $2^{n/2}$

13 **Compare MD5, SHA1 and RIPEMD-160 algorithm.**BTL4

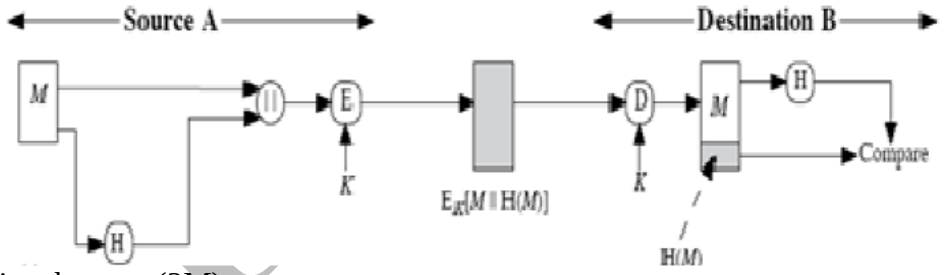
	MD5	SHA-1	RIPEMD160
Digest length	128 bits	160 bits	160 bits
Basic unit of proce ssing	512 bits	512 bits	512 bits
No of steps	64(4 rounds of 16)	80(4 rounds of 20)	160(5 pairs rounds of 16)
Maximum message size	infinity	2^{64}-1 bits	2^{64}-1 bits
Primitive logical function	4	4	5
Additive constants Used	64	4	9
Endianess	Little end ian	Big endian	Little endian

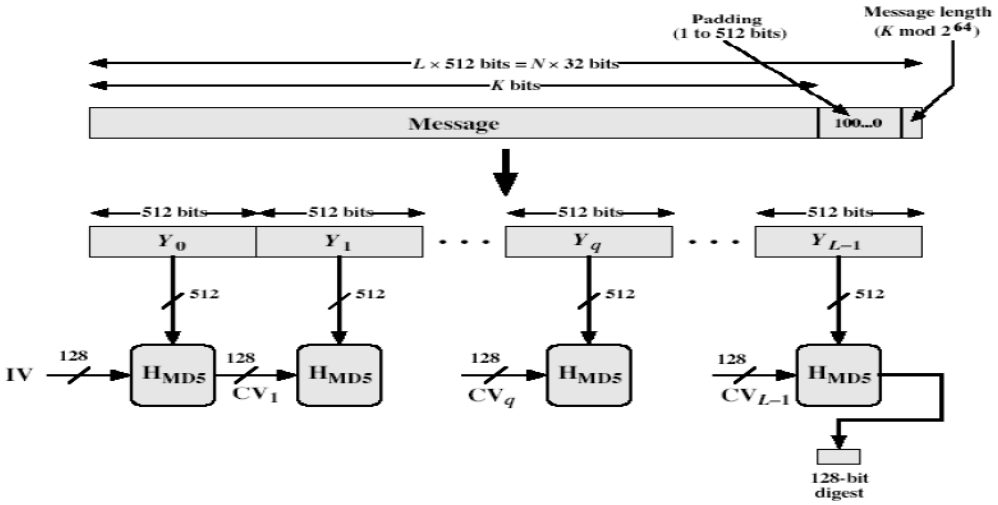
14 **Distinguish between direct and arbitrated digital signature.** BTL 3

Direct digital signature	**Arbitrated Digital Signature**
✓The direct digital signature involves only the communicating parties	✓The arbiter plays a sensitive and crucial role in this digital signature
✓This may be formed by encrypting the entire message with the sender's private key	✓Every signed message from a sender x to a receiver y goes first to an arbiter A, who subjects the message and its signature to a number of test to check its origin and content

15	**What are the properties a digital signature should have?** BTL1 ✓It must verify the author and the data and time of signature. ✓It must authenticate the contents at the time of signature. ✓It must be verifiable by third parties to resolve disputes.
16	**What are the applications in RC4 algorithm?** BTL1 ✓WEP Protocol ✓LAN Networks
17	**How is the security of a MAC function expressed?** BTL3 ✓Variable input size ✓Fixed output size ✓Efficiency ✓Preimage resistant (one-way property) ✓Second preimage resistant (weak Collison resistant) ✓Collison Resistant (Strong Collision Resistant) ✓Pseudorandomness
18	**Mention the significance of Signature function in DSS.** BTL4 The signature function also depends on the sender's private key (*PRa*) and a set of parameters known to a group of communicating principals. The signature function is such that only the sender, with knowledge of the private key, could have produced the valid signature.
19	**What is Elliptic curve?** BTL1 An elliptic curveis defined by an equation in two variables with coefficients. For cryptography, the variables and coefficients are restricted to elements in a finite field, which results in the definition of a finite abelian group.
20	**What are the two approaches of digital signatures?** BTL1 ✓It must verify the author and the date and time of the signature. ✓It must authenticate the contents at the time of the signature. ✓It must be verifiable by third parties, to resolve disputes.
21	**What are the uses of RC4?** BTL1 ✓Remarkably Simple And Quite Easy To Explain ✓RC4 Is Used In The Wifi Protected Access (WPA) Protocol That Are Part Of The Ieee 802.11 Wireless Lan Standard ✓RC4 Was Kept As A Trade Secret By RSA Security.
22	**What are the security services provided by Digital Signature?** BTL1 ✓MD5 ✓SHA
23	**What is Direct Digital Signature?** BTL1 The term **direct digital signature** refers to a digital signature scheme that involves only the communicating parties (source, destination). It is assumed that the destination knows the public key of the source.
24	**What are the requirements of Digital Signature?** BTL1 ✓The signature must be a bit pattern ✓The signature must use some information ✓Signature must be relatively easy to produce the digital signature. ✓Signature must be relatively easy to recognize and verify the digital signature. ✓Signature must be computationally infeasible to forge a digital signature.

	✓Signature must be practical to retain a copy of the digital signature in storage.
25	**What is Schnorr Digital Signature Scheme?** BTL1 The Schnorr signature scheme isbased on discrete logarithms [SCHN89, SCHN91]. The Schnorr scheme minimizesthe message-dependent amount of computation required to generate a signature.The main work for signature generation does not depend on the message and can be done during the idle time of the processor.

	PART *B
1	**Explain Hash function. (13M)** BTL4 **(AU Nov/Dec 2012)** **Answer:Page no.:351 to 353 in William Stallings** ✓Authentication function (2M) is a short piece of information used to authenticate a message—in other words, to confirm that the message came from the stated sender (its authenticity) and has not been changed. ✓Hash Function function (2M) A hash function maps a variable-length data block or message into a fixed-length value called a hashcode.A variation on the message authentication code is the one way hash function. As with MAC, a hash function accepts a variable size message M as input and produces a fixed-size output, referred to as hash code H(M). ✓Write in detail about MAC(2M) ✓Derive the steps(1 M) ✓Diagrams and cases(2M)  ✓Derive the steps(2M) ✓Diagrams and cases(2M)
2	**Explain MD5 algorithm. (13M)** BTL4 **(AU May/June 2012, Apr/May 2011)** **Answer:Pageno.:353 to 355in William Stallings** ✓Basic properties of MD5 algorithm(2M) ✓Padding(2M) ✓Append value(1M) ✓Divide input into 512 bit blocks(1M) ✓Initializing chaining variables(2M) ✓Process blocks(2M)



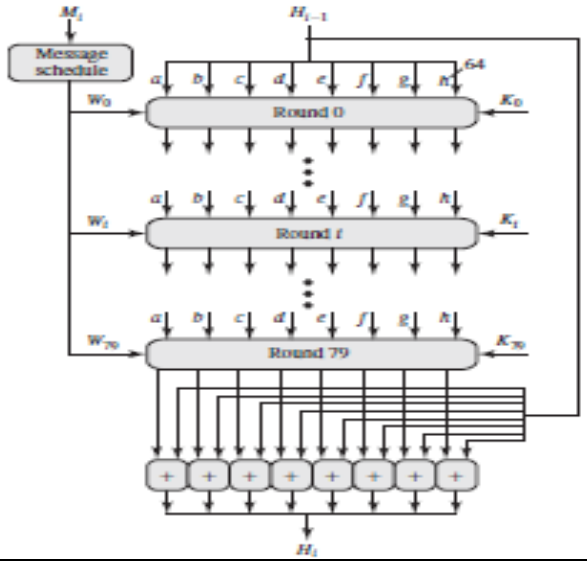
✓Processing of rounds (3M)

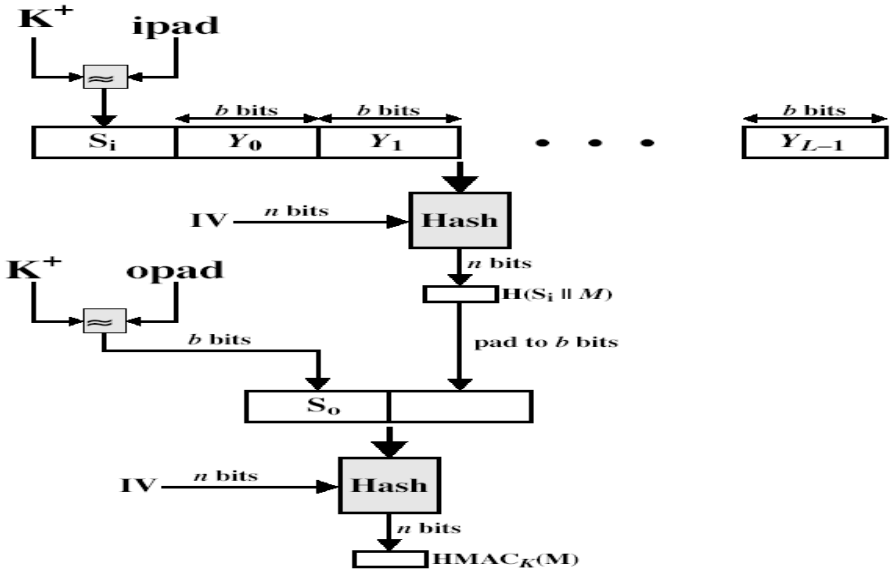
3 **Explain Secure Hash algorithm. (13M)** BTL4 **(Nov/Dec 2014,April/May 2013)**
Answer:Pageno.:366 to 368in William Stallings

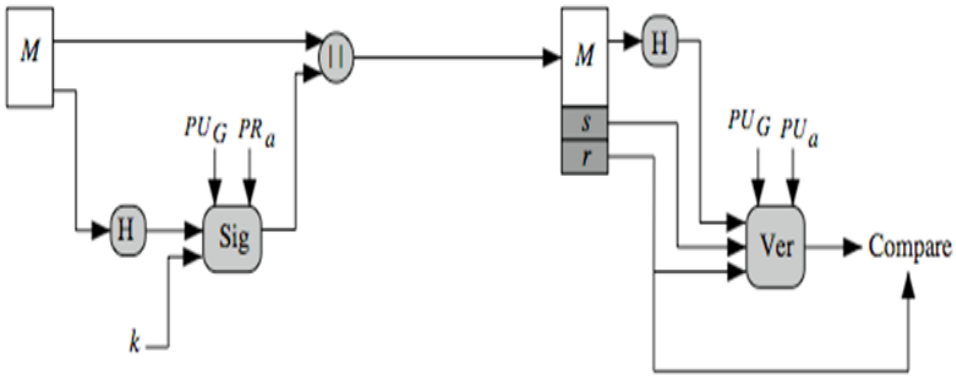
✓Elaboration of Secure Hash algorithm(3M)

- SHA was designed by NIST & NSA in 1993, revised 1995 as SHA-1
- US standard for use with DSA signature scheme
- standard is FIPS 180-1 1995, also Internet RFC3174
- ***note:*** the algorithm is SHA, the standard is SHS
- produces 160-bit hash values

✓Obtain original message(2M)
✓Find same message digest in SHA512(2M)
✓Explain the algorithm with steps(3M)
✓Example with structural diagram(3M)



4	**Explain Hash Based Message Authentication Code and CMAC .(13M)** BTL4 **Answer:Pageno.:399 to 401in William Stallings** ✓Structural diagram of HMAC(2M)  ✓Expand all the functions(2M) ✓Explain with steps(1M) ✓Creating length of two phases(3M) ✓Appending (1M) ✓Producing b-bit block(2M) ✓Security of HMAC (2M)
5	**Explain Digital Signatures.(13M)** BTL3 **(AU Nov/Dec 2011, May/June 2014)** **Answer:Page no.:420 to 422 in William Stallings** ✓Digital signature mechanism (2M) ✓Requirements of Digital signature (3M) ✓Types of Approaches(2M) ✓Digital signature types (3M) ✓Direct digital signature(1M) ✓Arbitrated digital signature (2M)
6	**Explain Authentication protocol. (13M)** BTL4 **Answer: Page no.:386 to 389 in William Stallings** ✓Mutual authentication(3M) ✓Examples of Replay attack(1M) ✓Symmetric encryption Approach(3M) ✓Time stamps(1M) ✓One say authentication(2M)

	✓Public key encryption approach (3M)
7	**Explain digital signature standard. (13M)** BTL4 **(AU May/June 2014)** **Answer: Page no.:427 to 429 in William Stallings** ✓Digital signature algorithm designed to provide digital signature (3M) ✓Diagrammatical expansion(3M) ✓Digital signature algorithm(4M) ✓Diagrammatical expansion of algorithm with various stages (3M) 
8	**Explain in detail about EL-GAMAL Algorithm. (13M)** BTL4 **(AU Nov/Dec 2013, May/June 2015)** **Answer:Page no.:424to 426 in William Stallings** ✓Public key crypto system based on concept of Diffie-Hellman key management(1M) ✓Components(2M) ✓El Gamal Key generation and steps to generate private and public keys(3M) ✓El Gamal Encryption(3M) ✓El Gamal Decryption(3M) ✓Proof of Decryption(1M)
	PART * C

1 **Explain message authentication requirement and its functions. (15M)** BTL4
Answer:Pageno.:386 to 389in William Stallings

- ✓Message requirement (3M)
- ✓Message functions (3M)
- ✓Security of MAC (3M)
- ✓Key terms and reviews (3M)
- ✓Authenticated encryption (3M)

2 **Explain Hash function and its Security. (15M)** BTL4
Answer:Pageno.:351 to 354in William Stallings

✓Definition (2M)

A **hash function** H accepts a variable-length block of data *M* as input and producesa fixed-size hash value *h* = H(*M*). A "good" hash function has the property that theresults of applying the function to a large set of inputs will produce outputs that are evenly distributed and apparently random.

✓Applications (3M)

- Used to create a one-way password file.
- Used for intrusion detection and virus detection
- Used to construct a pseudorandomfunction (PRF) or a pseudorandom number generator (PRNG).

✓Simple Hash Functions(3M)

✓Requirements and Security (3M)

Requirement	Description
Variable input size	H can be applied to a block of data of any size.
Fixed output size	H produces a fixed-length output.
Efficiency	H(x) is relatively easy to compute for any given x, making both hardware and software implementations practical.
Preimage resistant (one-way property)	For any given hash value h, it is computationally infeasible to find y such that H(y) = h.
Second preimage resistant (weak collision resistant)	For any given block x, it is computationally infeasible to find $y \neq x$ with H(y) = H(x).
Collision resistant (strong collision resistant)	It is computationally infeasible to find any pair (x, y) with $x \neq y$, such that H(x) = H(y).
Pseudorandomness	Output of H meets standard tests for pseudorandomness.

✓Cipher block chaining (4M)

3	**Explain Digital Signature and functions.(15M)** BTL4 **Answer:Pageno.:420 to 422in William Stallings**

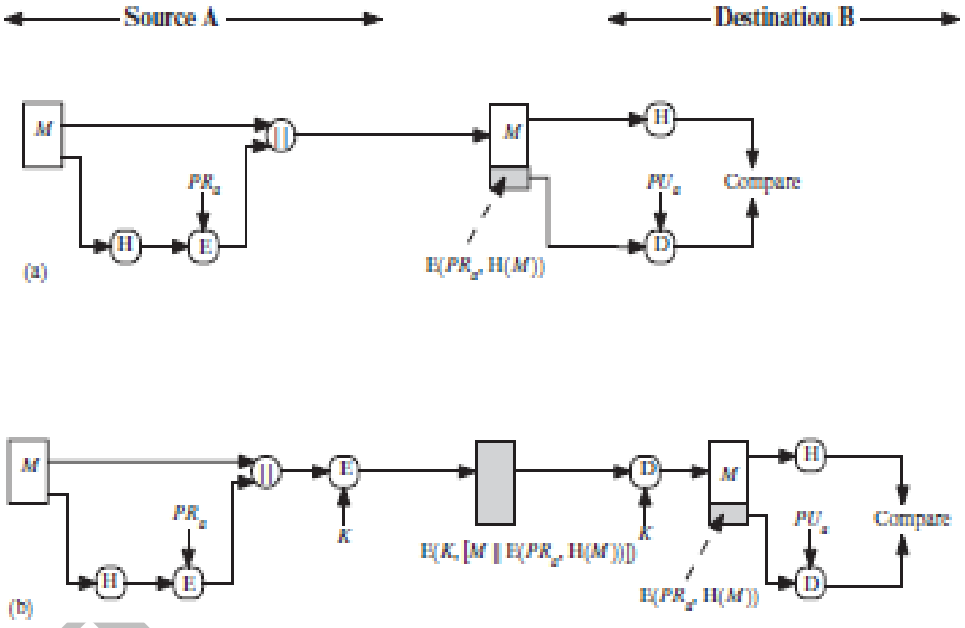
✓Explanation (2M)

The operation of the digital signature is similar to that of the MAC. In the case of the digital signature, the hash value of a message is encrypted with a user's private key.

✓Properties (3M)

✓Attacks and forgeries (2M)

✓Diagrams (4M)



✓Requirements (4M)

UNIT-4 EVIDENCE COLLECTION AND FORENSICS TOOLS

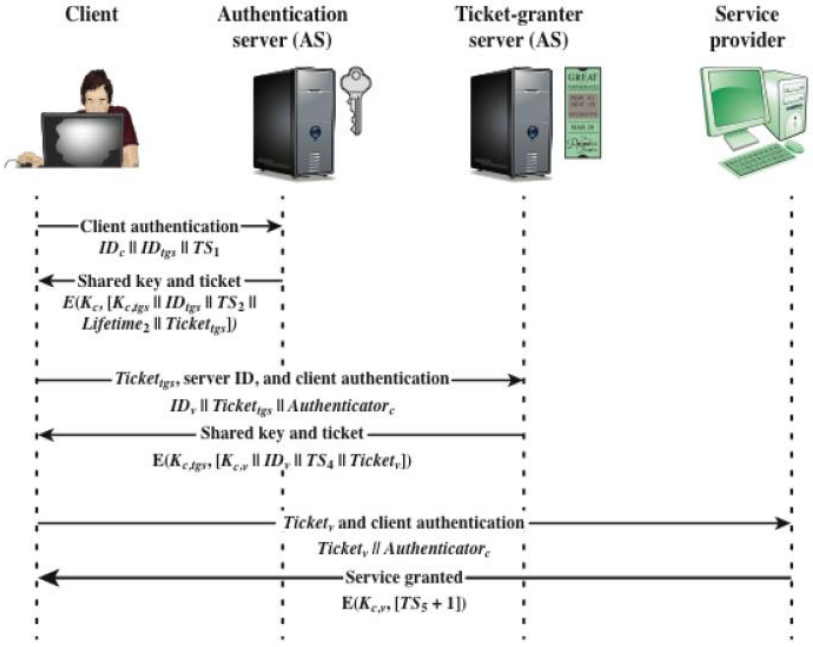
Processing Crime and Incident Scenes – Working with Windows and DOS Systems. Current Computer Forensics Tools: Software/ Hardware Tools

PART * A

1	**Define Kerberos.** BTL1 Kerberos is an authentication service developed as part of project Athena at MIT. The problem that Kerberos address is, assume an open distributed environment in which users at work stations wish to access services on servers distributed throughout the network.
2	**What is Kerberos? Write its uses.** BTL2 Kerberos is an authentication service developed as a part of project Athena at MIT. Kerberos provides a centralized authentication server whose functions are to authenticate servers.
3	**What are the requirements defined by Kerberos?** BTL1 ✓ Secure ✓ Reliable ✓ Transparent ✓ Scalable
4	**In the content of Kerberos, What is realm?** BTL1 ✓ A full service Kerberos environment consisting of a Kerberos server, a no. of clients, no.of application server requires the following ✓ The Kerberos server must have user ID and hashed password of all participating users in its database. ✓ The Kerberos server must share a secret key with each server. Such an environment is referred to as "Realm".
5	**What is the purpose of X.509 standard?** BTL1 X.509 defines framework for authentication services by the X.500 directory to its users.X.509 defines authentication protocols based on public key certificates.
6	**List the 3 classes of intruder.** BTL2 ✓ Masquerader ✓ Misfeasor ✓ Clandestine user
7	**Define virus. Specify the types of viruses.** BTL1 A virus is a program that can infect other program by modifying them the modification includes a copy of the virus program, which can then go on to infect other program. Types: ✓ Parasitic virus ✓ Memory-resident virus ✓Boot sector virus ✓Stealth virus

<table>
<tr><td></td><td>✓ Polymorphic virus</td></tr>
<tr><td>8</td><td>What is application level gateway? BTL2
An application level gateway also called a proxy server; act as a relay of application-level traffic. The user contacts the gateway using a TCP/IP application, such as Telnet or FTP, and the gateway asks the user for the name of the remote host to be accessed.</td></tr>
<tr><td>9</td><td>List the design goals of firewalls. BTL1
✓All traffic from inside to outside, and vise versa, must pass through the firewall.
✓Only authorized traffic, as defined by the local security policy, will be allowed to pass.
✓The firewall itself is immune to penetration</td></tr>
<tr><td>10</td><td>What are the steps involved in SET Transaction? BTL2
The customer opens an account
The customer receives a certificate
Merchants have their own certificate
The customer places an order.
The merchant is verified.
The order and payment are sent.
The merchant requests payment authorization.
The merchant confirm the order.
The merchant provides the goods or services.
The merchant requests payment.</td></tr>
<tr><td>11</td><td>What is dual signature? Write its purpose. BTL2
The purpose of the dual signature is to link two messages that intended for two different recipients. To avoid misplacement of orders.</td></tr>
<tr><td>12</td><td>What is the need for authentication applications? BTL1
✓ Security for E-mail
✓ Internet protocol security
✓ IP address security.</td></tr>
<tr><td>13</td><td>Differentiate public key encryption and conventional encryption. BTL3
<table>
<tr><th>Conventional encryption</th><th>Public key encryption</th></tr>
<tr><td>Same algorithm with same key used for encryption and decryption</td><td>Same algorithm Is used for encryption and decryption with a pair of keys</td></tr>
<tr><td>Sender and receiver must share the algorithm and key</td><td>Sender and receiver have one of the matched pair key</td></tr>
<tr><td>Key must be kept secret.</td><td>Any one of the key must be kept secretly.</td></tr>
</table></td></tr>
<tr><td>14</td><td>What is message authentication? BTL2
Message authentication is a process that verifies whether the recived message comes from assigned source has not been altered.</td></tr>
</table>

15	**Specify the requirements for message authentication.** BTL3 ✓ Disclosure ✓ Traffic analysis ✓ Masquerade ✓ Content modification ✓ Sequence modification ✓ Timing modification ✓ Repudiation.
16	**Specify the four categories of security threats.** BTL3 ✓ Interruption ✓ Interception ✓ Modification ✓ Fabrication
17	**What do you mean by SET? What are the features of SET?** BTL2 SET is an open encryption and security specification designed to protect credit card transaction on the Internet.
18	**Write any 3 hash algorithm.** BTL2 ✓ MD5 algorithm ✓ SHA-I ✓ RIPEMD-160 algorithm.
19	**What is worm?** BTL2 A worm is a program that can relicate itself and send copie s from computer to computer across network connections
20	**What is Bastion host?** BTL2 Bastion host is a system identified by firewall administrator as critical strong point in network security
21	**Write the four general techniques of firewall.** BTL3 ✓ Security control ✓ Direction control ✓ User control ✓ Behavior control
22	**Write the three types of firewall.** BTL3 ✓ Packet filter ✓ Application level gateway ✓ Circuit level gateway
23	**List approaches for intrusion detection.** BTL1 ✓Statistical anomaly detection ✓Rule based detection
24	**What is meant by SET? What are the features of SET?** BTL2 Secure Electronic Transaction (SET) is an open encryption and security specification designed to protect credit card transaction on the internet. Features are: ✓Confidentiality of information

	✓Integrity of data ✓Cardholder account authentication ✓Merchant authentication
25	**What is Zombie?** BTL2 Zombie is a program that securely takes over another internet-attached computer and then uses that computer to launch attacks are difficult to trace the Zombie's creator.
	PART * B
1	**Explain Authentication applications**. **(13M)** BTL4 **(May/June 2015, May/June 2014)** **Answer : Page : 476 – William Stallings** ✓Kerberos It is an authentication service developed as part of project Athena at MIT. The problem that Kerberos address is, assume an open distributed environment in which users at work stations wish to access services on servers distributed throughout the network. It is an authentication protocol (2M) ✓How Kerberos works It differs from username authentication methods because instead of authenticating each user to each network service, it uses symmetric encryption and a trusted third party to authenticate users to a suite of network services (2M)  ✓ Kerberos Message Exchanges (3M)

(1) C → AS $ID_c \| ID_{tgs} \| TS_1$

(2) AS → C $E(K_c, [K_{c,tgs} \| ID_{tgs} \| TS_2 \| Lifetime_2 \| Ticket_{tgs}])$

$Ticket_{tgs} = E(K_{tgs}, [K_{c,tgs} \| ID_C \| AD_C \| ID_{tgs} \| TS_2 \| Lifetime_2])$

(a) Authentication Service Exchange to obtain ticket-granting ticket

(3) C → TGS $ID_v \| Ticket_{tgs} \| Authenticator_c$

(4) TGS → C $E(K_{c,tgs}, [K_{c,v} \| ID_v \| TS_4 \| Ticket_v])$

$Ticket_{tgs} = E(K_{tgs}, [K_{c,tgs} \| ID_C \| AD_C \| ID_{tgs} \| TS_2 \| Lifetime_2])$

$Ticket_v = E(K_v, [K_{c,v} \| ID_C \| AD_C \| ID_v \| TS_4 \| Lifetime_4])$

$Authenticator_c = E(K_{c,tgs}, [ID_C \| AD_C \| TS_3])$

(b) Ticket-Granting Service Exchange to obtain service-granting ticket

(5) C → V $Ticket_v \| Authenticator_c$

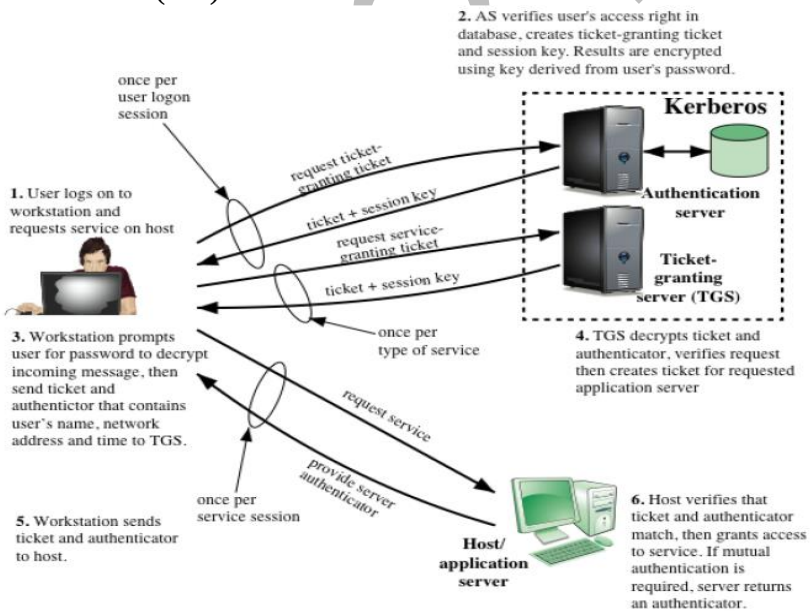
(6) V → C $E(K_{c,v}, [TS_5 + 1])$ (for mutual authentication)

$Ticket_v = E(K_v, [K_{c,v} \| ID_C \| AD_C \| ID_v \| TS_4 \| Lifetime_4])$

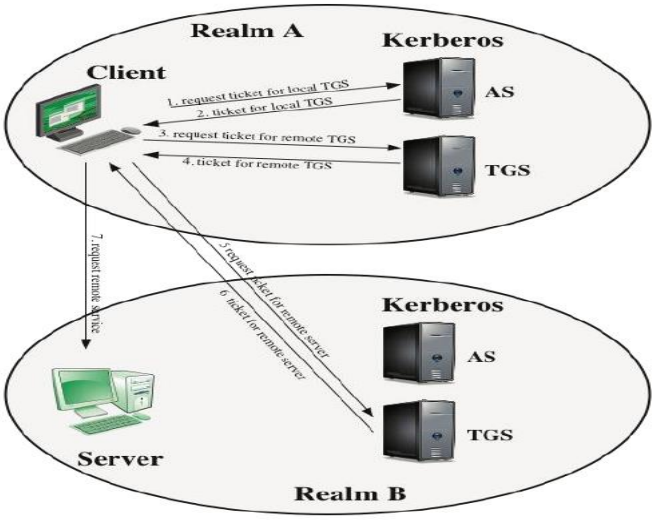
$Authenticator_c = E(K_{c,v}, [ID_C \| AD_C \| TS_5])$

(c) Client/Server Authentication Exchange to obtain service

✓Kerberos Overview (2M)



✓Kerberos Realm- A full-service Kerberos environment consisting of a Kerberos server, a number of clients, and a number of application servers. (2M)



✓Difference between Kerberos 4 and 5 (1M)

✓Kerberos Version 5 Message Exchanges (1M)

(1) C → AS *Options* || *IDc* || *Realmc* || *IDtgs* || *Times* || *Nonce*1

(2) AS → C *Realmc* || *IDC* || *Tickettgs* || E(*Kc*, [*Kc,tgs* || *Times* || *Nonce*1 || *Realmtgs* || *IDtgs*])

Tickettgs = E(*Ktgs*, [*Flags* || *Kc,tgs* || *Realmc* || *IDC* || *ADC* || *Times*])

(a) Authentication Service Exchange to obtain ticket-granting ticket

(3) C → TGS *Options* || *IDv* || *Times* || || *Nonce*2 || *Tickettgs* || *Authenticatorc*

(4) TGS → C *Realmc* || *IDC* || *Ticketv* || E(*Kc,tgs*, [*Kc,v* || *Times* || *Nonce*2 || *Realmv* || *IDv*])

Tickettgs = E(*Ktgs*, [*Flags* || *Kc,tgs* || *Realmc* || *IDC* || *ADC* || *Times*])

Ticketv = E(*Kv*, [*Flags* || *Kc,v* || *Realmc* || *IDC* || ADC || *Times*])

Authenticatorc = E(*Kc,tgs*, [*IDC* || *Realmc* || *TS*1])

(b) Ticket-Granting Service Exchange to obtain service-granting ticket

(5) C → V $Options \| Ticket_v \| Authenticator_c$

(6) V → C $E_{K_{C,V}}$ [$TS_2 \| Subkey \| Seq\#$]

Ticketv = E(*Kv*, [Flags || *Kc,v* || *Realmc* || *IDC* || *ADC* || *Times*])

Authenticatorc = E(*Kc,v*, [*IDC* || *Realmc* || *TS*2 || *Subkey* || *Seq#*])

2 **Explain in detail about X.509. (13M)** BTL4 **(May/June 2013)**

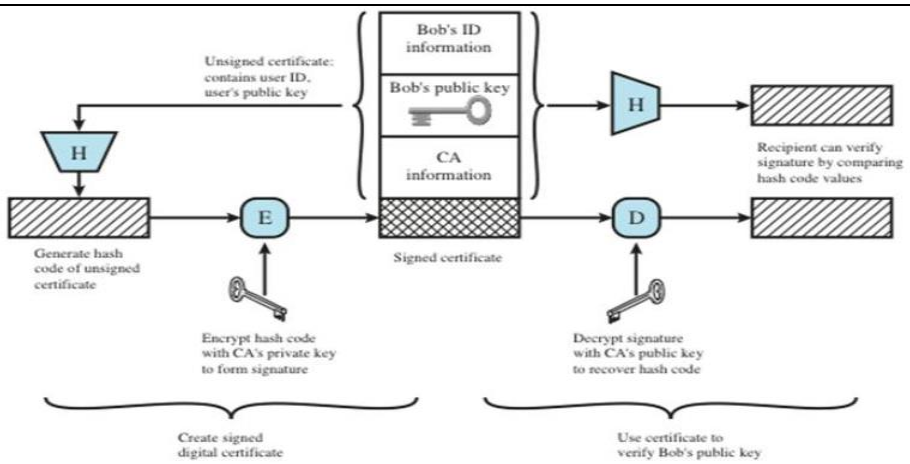
Answer : Page : 453 – William Stallings

✓X 509Authentication service defines the structure of digital certificates

X.509 defines framework for authentication services by the X.500 directory to its users.X.509 defines authentication protocols based on public key certificates. (2M)

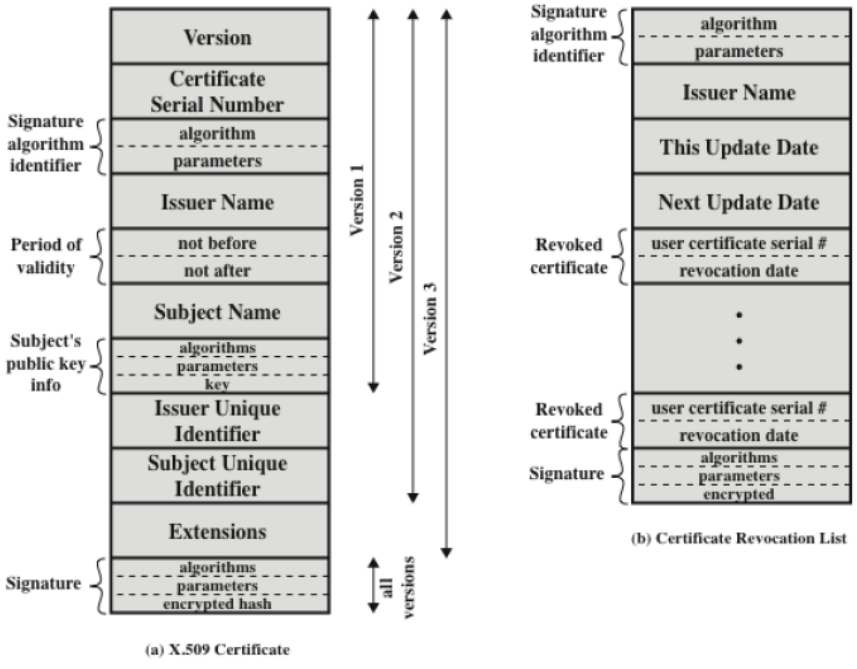
✓X.509 Framework- Was initially issued in 1988 with the latest revision in 2000 .Based on the use of public-key cryptography and digital signatures .Does not dictate the use of a specific algorithm but recommends RSA.Does not dictate a specific hash algorithm (2M)

✓Public Key Certificate Use



(3M)

✓X.509 Format



(3M)

✓Obtaining Certificate (2M)

✓Certificate Revocation (1M)

3 **Explain Secure Electronic Transaction. (13M)** BTL4 **(Apr/May 2011, Nov/Dec 2011, Nov/Dec 2012)**

Answer : Page : 627 – William Stallings

SET(2M)

✓Set of security protocol and formats enable user to employ existing infrastructure

Secure Electronic Transaction (SET) is an open encryption and security specification designed to protect credit card transaction on the internet (2M)

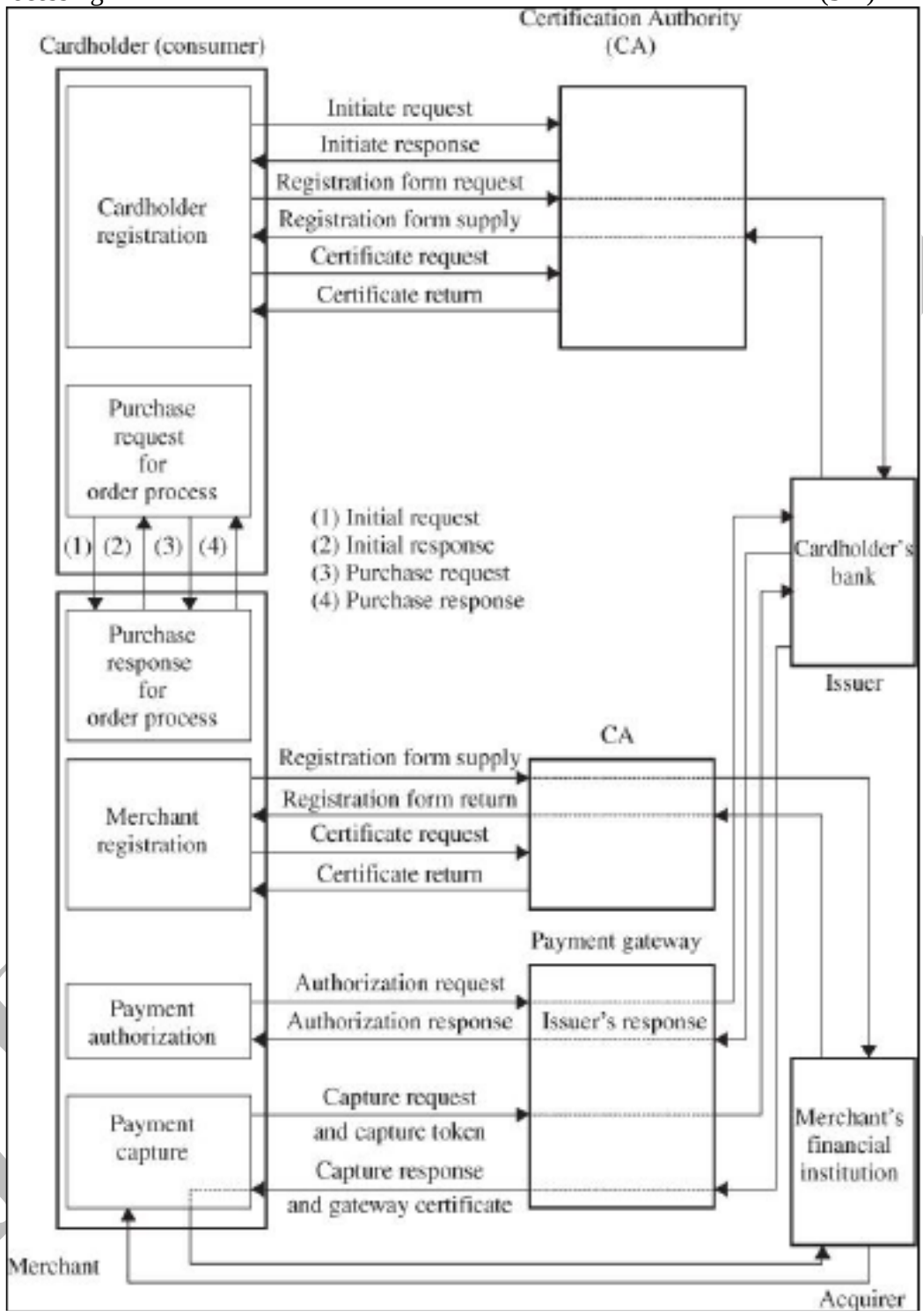
✓Services provided by SET (1M)

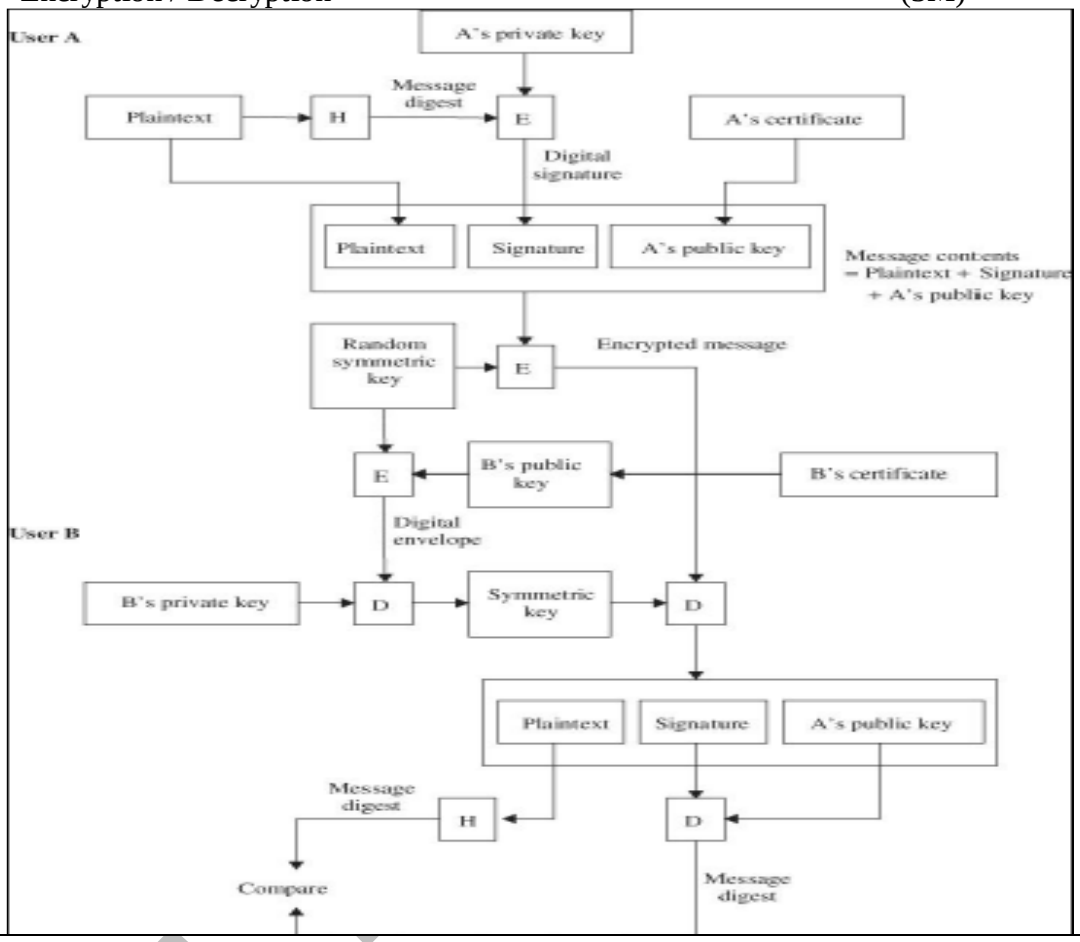
✓Key features (1M)

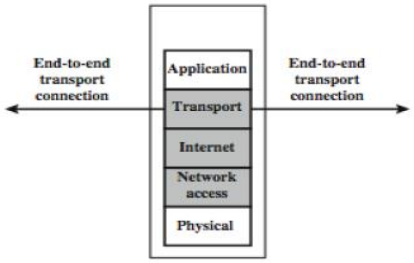
✓Business Requirements for SET (1M)

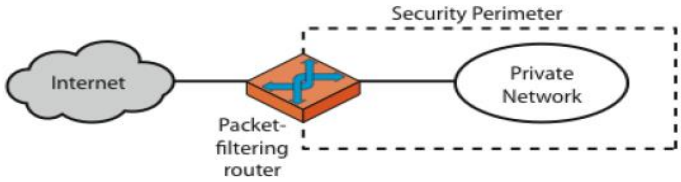
✓SET System Participants (2M)

✓Processing (3M)



	✓Encryption / Decryption (3M) 
4	**Explain about Firewall and types of Firewall and Design of Firewall. (13M)** BTL4 **(Apr/May 2011, Nov/Dec 2011, May/June 2012, Nov/Dec 2012, Nov/Dec 2013, May/June 2015)** **Answer : Page : 630 – William Stallings** ✓Firewall (1M) A **choke point** of control and monitoring,interconnects networks with differing trust,imposes restrictions on network services,only authorized traffic is allowed,auditing and controlling access ,can implement alarms for abnormal behavior ✓Types of firewall (i)Packet filtering router firewall Protecting internal users from the external network threats is to implement this type of security (1M) ✓Diagram(2M)



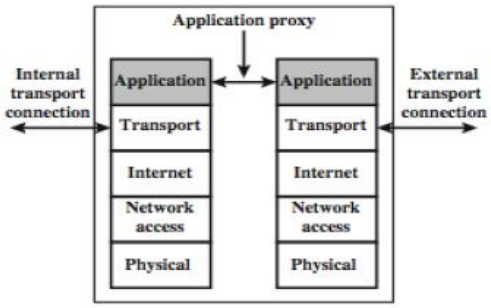


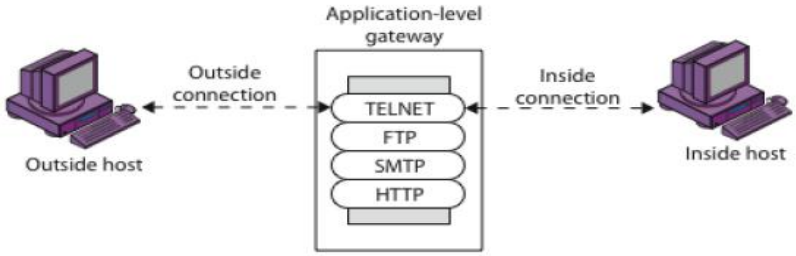
✓Advantages and Disadvantages(1M)

(ii)Application Level Gateway

Have application specific gateway / proxy,has full access to protocol,user requests service from proxy ,proxy validates request as legal,then actions request and returns result to user,can log / audit traffic at application level (1M)

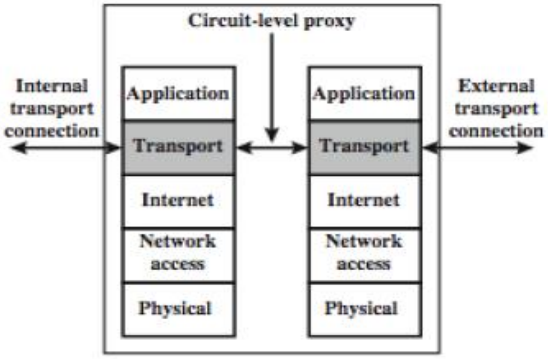
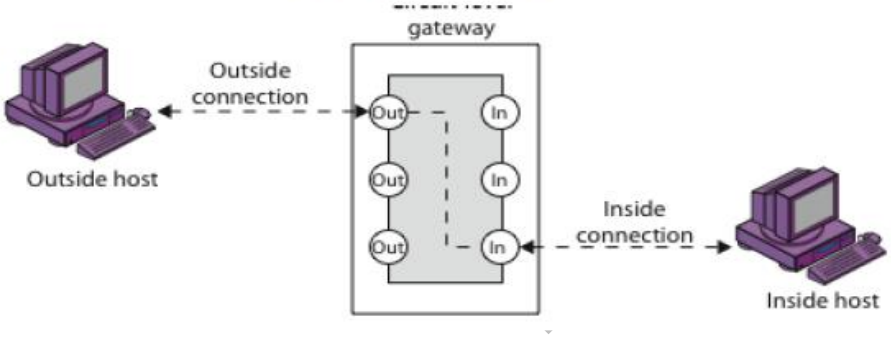
✓Diagram(2M)

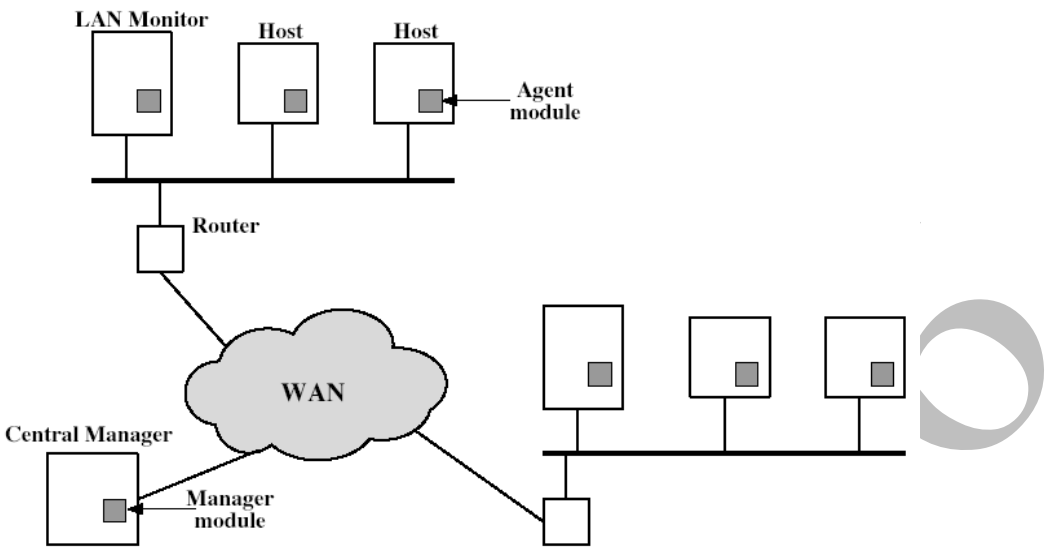




✓Advantages and Disadvantages(1M)

(iii)Circuit Level Gateway- relays two TCP connections,imposes security by limiting which such connections are allowed ,once created usually relays traffic without examining contents.(1M)

	✓Diagram(2M) ✓Advantages and Disadvantages(1M)  **(e) Circuit-level proxy firewall** 
5	**Explain in detail about Intrusion detection system. (13M)** BTL4 **(Nov/Dec 2011, May/June 2014)** **Answer : Page : 645 – William Stallings** ✓Intrusion Detection Systems look for attack signatures, which are specific patterns that usually indicate malicious or suspicious intent. (1M) ✓Statistical anomaly detection Involves the collection of data relating to the behavior of legitimate users over a period of time (2M) ✓Rule based detection Involves as a set of rules can be used to decide given behavior of an intruder (2M) ✓Distributed intrusion detection System should detect a substantial percentage of intrusion while keeping the false alarm rate at acceptable level. (2M) ✓Rule based penetration identification (2M) ✓Architecture for distribution intrusion detection – diagram (2M)



✓LAN Monitor agent module

Operates same as a host agent module except that is analyzes LAN traffic and reports the results to the central manager. (1M)

✓Honey Pot

Relatively recent innovation in intrusion detection technology (1M)

6 **Explain about Malicious software viruses. (13M)** BTL4 **(May/June 2012, Nov/Dec 2012, May/June 2013, Nov/Dec 2013, May/June 2014, May/June 2015)**

Answer : Page : 645 & 650 – William Stallings

✓Malicious programs

Overall taxonomy of software threats (1M)

✓Virus

It is a program that can infect other programs by modify them (1M)

✓Four phases

Dormant phase
Propagation phase
Triggering phase
Execution phase (1M)

✓Virus structure

Virus can be postpeneled to an executable program (1M)

✓Types of virus

Macro virus
E mail virus
Morris virus
Worm (1M)

✓Macro virus

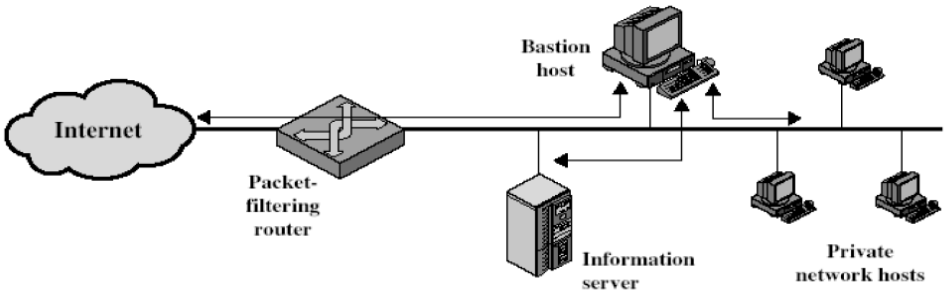
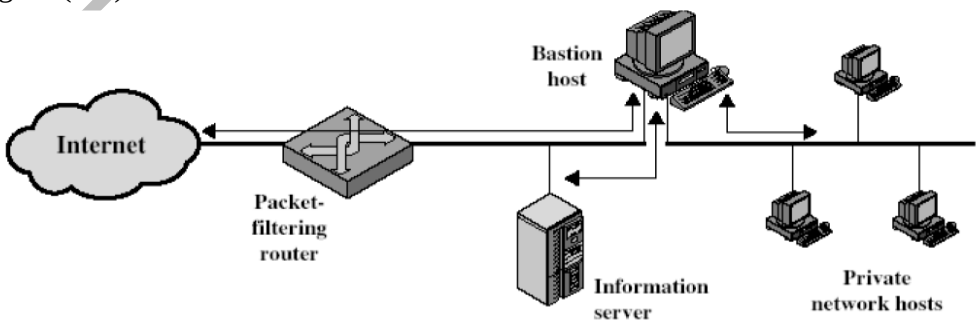
Platform independent virus infect the documents and easily spread (2M)

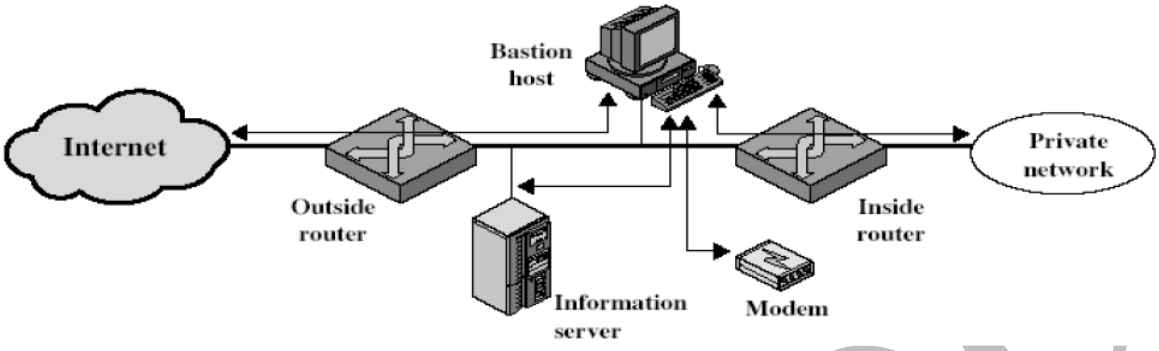
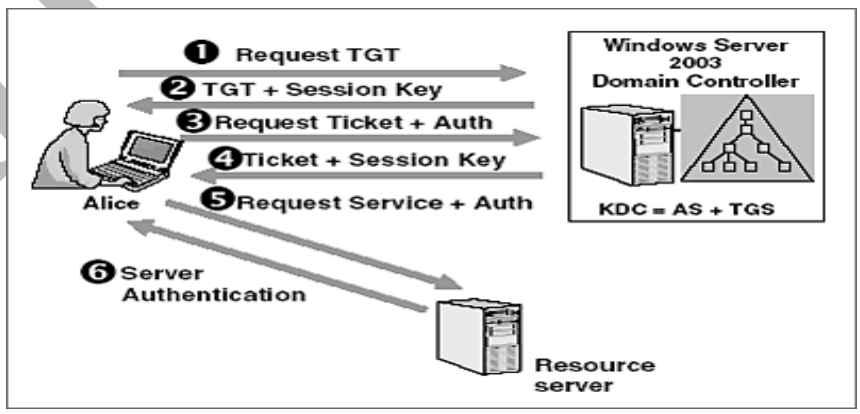
✓E mail virus

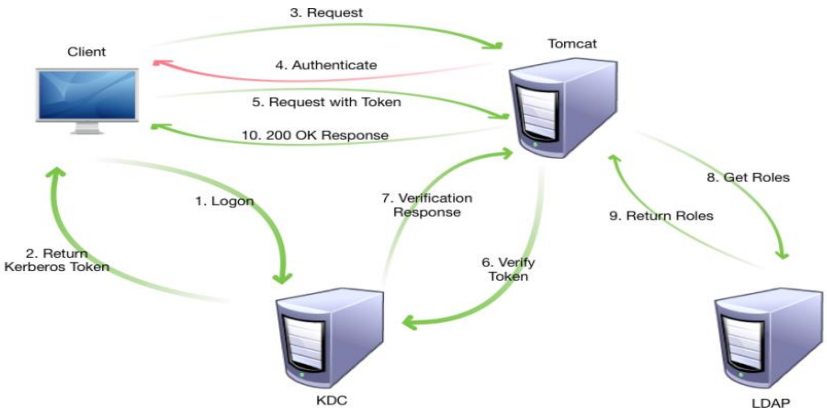
It spreads through mails, use of MS embedded in attachment (2M)

✓Worm

It seeks out more machines to infect and every machine that is infected serves as a launch is automatic padeling for attacks on other machines (2M)

	✓Virus counter measures (2M)
7.	**Explain about Various types of Configurations or Firewall Designs in Firewall. (13M)** BTL4 **Answer : Page : 630 – William Stallings** The three basic firewall designs are considered: **a single-homed bastion host, a dual-homed bastion host, and a screened subnet firewall**.(1M) (i)**Screened Host Firewall (Single-Homed Bastion Host)** Uses a single-homed bastion host plus a packet-filtering router. Single-homed bastion hosts can be configured as either circuit-level or application-level gateways. When using either of these two gateways, each of which is called a *proxy server*, the bastion host can hide the configuration of the internal network.(1M) ✓Diagram(2M)  ✓Advantages and Disadvantages(1M) **(ii)Screened Host Firewall (Dual-Homed Bastion Host)** The configuration of the screened host firewall using a dual-homed bastion host adds significant security, compared with a single-homed bastion host. Dual-homed bastion host has two network interfaces. (1M) ✓Diagram(2M)  ✓Advantages and Disadvantages(1M) (iii)**Screened Subnet Firewall** The third implementation of a firewall is the screened subnet, which is also known as a *DMZ*. This firewall is the most secure one among the three implementations, simply because it uses a bastion host to support both circuit- and application-level gateways. All publicly accessible devices, including modem and server, are placed inside the DMZ. (1M)

	✓Diagram(2M)  ✓Advantages and Disadvantages(1M)
	PART * C
1	**Explain Authentication applications. (15M)** BTL4 **Answer : Page : 468 – William Stallings** ✓Kerberos It is an authentication service developed as part of project Athena at MIT. The problem that Kerberos address is, assume an open distributed environment in which users at work stations wish to access services on servers distributed throughout the network. It is an authentication protocol (3M) ✓How Kerberos works It differs from username authentication methods because instead of authenticating each user to each network service, it uses symmetric encryption and a trusted third party to authenticate users to a suite of network services (3M) ✓Steps with protocol (5M) User client logon Client authentication Client service authentication Client service request ✓Diagram  (2M)

	✓Explanation of working methodology with diagram  (2M)
2	**Explain Internet Firewall and its related terminology. (15M)** BTL4 **Answer : Page : CHAPTER 22 – William Stallings** ✓Need for firewall It is a mechanism that protects and isolates internal network (3M) ✓Characteristics Service control Direction control User control Behavior control (3M) ✓Types of firewall Packet filter Application level gateway Circuit level gateway (3M) ✓Firewall The host is a system identified by the firewall administrator as a critical strong point in the network security (3M) ✓Firewall location and configuration The first type of firewall is a screened host which uses a single homes bastion host plus a packet filtering router. It uses two or more network interfaces It is a network architecture that uses single firewall with 3 network interface.(3M)

UNIT 5- ANALYSIS AND VALIDATION

Validating Forensics Data – Data Hiding Techniques – Performing Remote Acquisition – Network Forensics – Email Investigations – Cell Phone and Mobile Devices Forensics

PART * A

1 **Define key Identifier -** BTL1

PGP assigns a key ID to each public key that is very high probability unique with a user ID. It is also required for the PGP digital signature. The key ID associated with each public key consists of its least significant 64bits.

2 **List the limitations of SMTP/RFC 822.** BTL1

- SMTP cannot transmit executable files or binary objects.
- It cannot transmit text data containing national language characters.
- SMTP servers may reject mail message over certain size.
- SMTP gateways cause problems while transmitting ASCII and EBCDIC.
- SMTP gateways to X.400 E-mail network cannot handle non textual data included in X.400 messages.

3 **Define S/MIME.** BTL2

Secure/Multipurpose Internet Mail Extension(S/MIME) is a security enhancement to the MIME Internet E-mail format standard, based on technology from RSA Data Security.

4 **What are the different between SSL version 3 and TLS?** BTL1

SSL	**TLS**
In SSL the minor version is 0 and major version is 3	In TLS, the major version is 3 and the minor version is 1
SSL use HMAC alg., except that the padding bytes concatenation	TLS makes use of the same alg
SSL supports 12 various alert codes	TLS supports all of the alert codes defined in SSL3 with the exception of no certificate

5 **What are the services provided by PGP services?** BTL1

- Digital signature
- Message encryption
- Compression
- E-mail compatibility
- Segmentation

6 **Why E-mail compatibility function in PGP needed?** BTL2

Electronic mail systems only permit the use of blocks consisting of ASCII text. To

	accommodate this restriction PGP provides the service converting the row 8-bit binary stream to a stream of printable ASCII characters. The scheme used for this purpose is Radix-64 conversion
7	**Name any cryptographic keys used in PGP.** BTL3 ✓One-time session conventional keys. ✓Public keys. ✓Private keys. ✓Pass phrase based conventional keys.
8	**Define S/MIME .**BTL1 Secure / Multipurpose Internet Mail Extension(S/MIME) is a security enhancement to the MIME internet E-mail format standard, based on technology from RSA Data security.
9	**What are the services provided by PGP services?** BTL2 ✓ Digital signature ✓ Compression ✓ Segmentation ✓ Message encryption ✓ E-mail compatibility
10	**Name any cryptographic keys used in PGP.** BTL3 ✓ One time session conventional keys ✓ Public keys ✓ Private keys ✓ Pass phrase based conventional keys.
11	**What is security association?** BTL2 A security association (SA) is the establishment of shared security attributes between two network entities to support secure communication.
12	**What does Internet key management in IPSec?** BTL2 Internet key exchange (IKE) is a key management protocol standard used in conjunction with the Internet Protocol Security (IPSec) standard protocol. It provides security for Virtual Private Networks (VPNs) negotiations and network access to random hosts.
13	**List out the IKE hybrid protocol dependence.** BTL1 ✓ISAKMP - Internet Security Association and Key Management Protocols. ✓Oakley
14	**What does IKE hybrid protocol mean?** BTL2 Internet Key Exchange (IKE) is a key management protocol standard used in conjunction with the internet protocol security (IPSec) standard protocol. It provides security for Virtual Private Networks (VPNs) negotiations and network access to random hosts.
15	**What are the two security services provided by IPSec?** BTL2 ✓ Authentication Header (AH) ✓ Encapsulating Security Payload (ESP).
16	**What are the fields available in AH header?** BTL2 ✓ Next header ✓ Payload length

	✓ Reserved ✓ Security parameter ✓ Sequence number Integrity check value
17	**What is virtual private network?** BTL2 VPN means virtual private network, a secure tunnel between two devices.
18	**What is ESP?** BTL2 ESP-encapsulating security payload provides authentication, integrity and confidentiality, which protect against data tempering and provide message content protection
19	**What is Behavior-Blocking Software (BBS)?** BTL2 BBS integrates with the OS of a host computer and monitors program behavior in real time for malicious actions.
20	**List password selection strategies.** BTL1 ✓ User education ✓ Reactive password checking ✓ Computer-generated password. ✓ Proactive password checking.

Part * B	
1	**Explain about Email Security. (13M)** BTL4 **Answer : Page : 591 – William Stallings** ✓Modes of Operation Authentication Confidentiality Compression e-mail compatibility (2M) ✓Tunnel mode It provides the protection to the entire IP Packet (1M) ✓Transport mode It provides protection primarily for upper layer protocols (1M) ✓Internet key exchange protocol Manual Automated (2M) ✓Security Association It provides a framework for internet key management and provides the specific protocol support including formats (1M) ✓Contents of SAD

	✓It represent a specification of security services offered to traffic carried through a in-directional channel from one node to another (1M) ✓Authentication Header ✓It is used to provide connectionless integrity and data origin authentication for IP datagrams (1M) ✓Authentication Header fields (1M) Access control Connectionless integrity Data origin authentication Confidentiality ✓Anti Replay Attacks It is a sub protocol of IPsec that is part of Internet engineering task force. The main goal is to avoid hackers injecting or making changes in packets that travel from a source to destination (1M) ✓Values in sliding window (2M)
2	**Explain in detail about IPSEC. (13M)** BTL4 **Answer : Page : 640 – William Stallings** ✓IP v4 Specifies an IPv4 address or range of addresses that are authorized senders for a domain (2M) ✓IP v6 Specifies an IPv6 address or range of addresses that are authorized senders for a domain. (2M) ✓AH tunnel modes It authenticates the entire inner IP packet selected portion of outer IP header (1M) ✓IP header An IP header is header information at the beginning of an IP packet which contains information about IP version, source IP address, destination IP address, time-to-live (2M) ✓New IP header (1M) ✓TCP header TCP is the primary transport protocol used to provide reliable, full-duplex

connections. The most common use of TCP is to exchange TCP data encapsulated in an IP datagram. (2M)

✓Original data

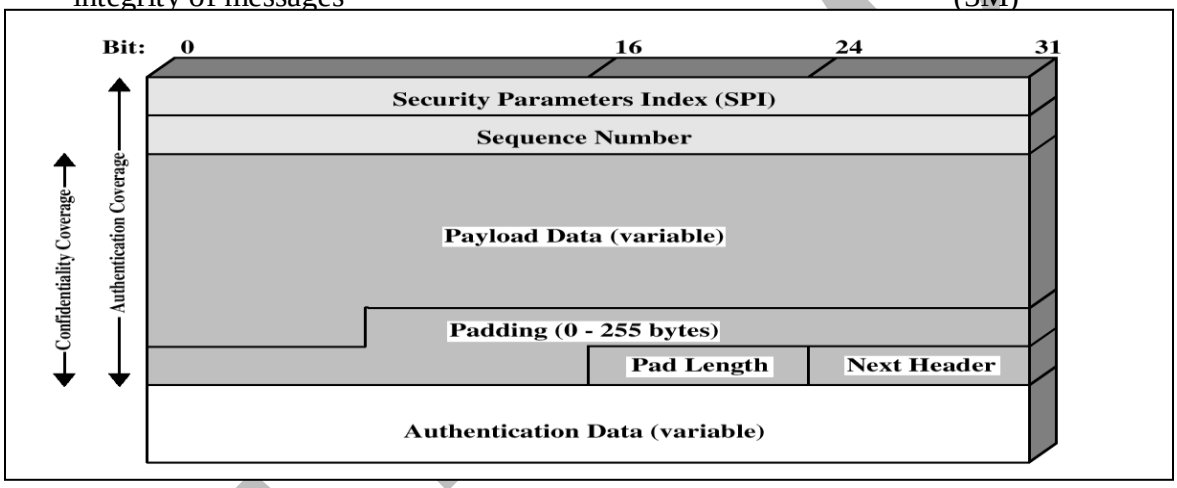
It refers to any data object that hasn't undergone thorough processing, either manually or through automated computer software. (2M)

✓Original IP header (1M)

3 **Explain Encapsulating security payload. (13M)** BTL4

Answer : Page : 651 – William Stallings

✓ESP consists of an encapsulating header and trailer used to provide encryption or combined encryption/ authentication. The current specification is RFC 4303, IP Encapsulating Security Payload (ESP).The purpose is to provide confidentiality and integrity of messages (3M)



✓ESP Transport mode (1M)

Transport mode ESP is used to encrypt and optionally authenticate the data carried by IP

✓Operation of ESP Transport mode (4M)

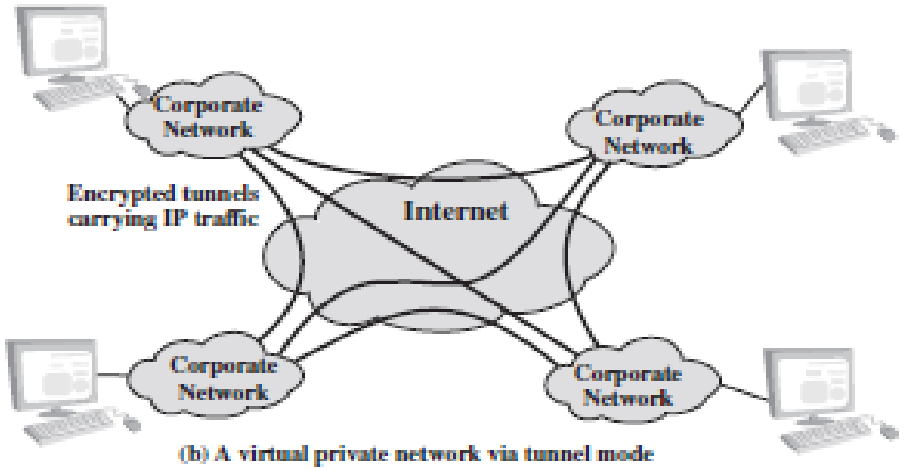
(a) Transport-level security

✓ESP tunnel mode

Tunnel mode ESP is used to encrypt an entire IP packet. For this mode, the ESP header is prefixed to the packet and then the packet plus the ESP trailer is encrypted. This

method can be used to counter traffic analysis (1M)

✓Operation of ESP tunnel mode (4M)



(b) A virtual private network via tunnel mode

4 **Explain Internet security Association and Key Management Protocol. (13M)** BTL4

Answer : Page : 663 – William Stallings

✓Procedures and formats for establishing maintaining and deleting Security Association information (1M)

✓IP Seckey management (2M)

✓Initiator cookie (1M)

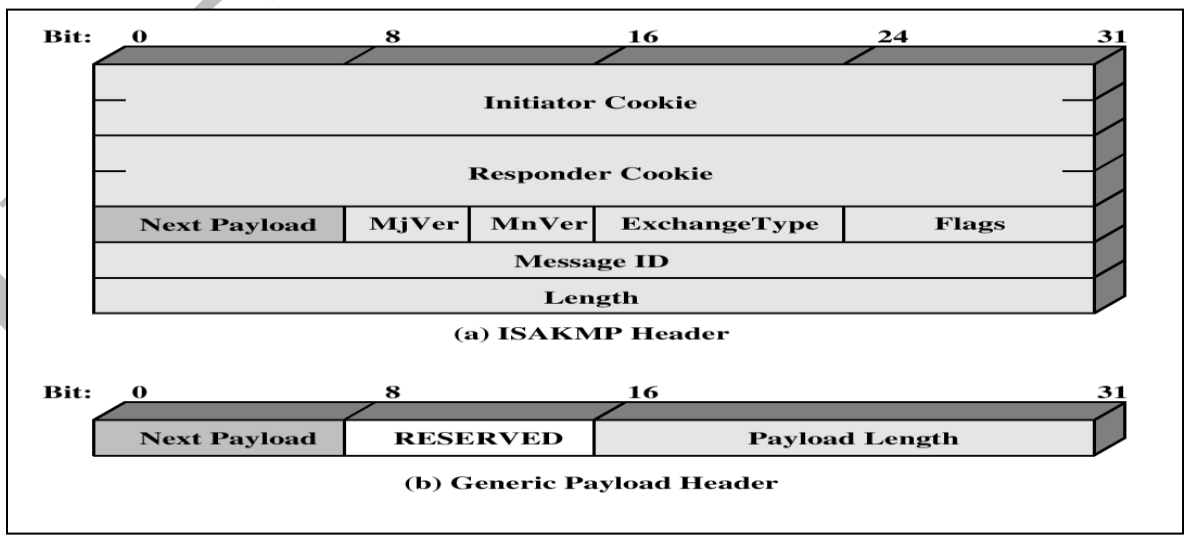
✓Responder cookie (1M)

✓Major and minor version (3M)

✓Message ID (1M)

✓Length (1M)

✓Payloads (2M)



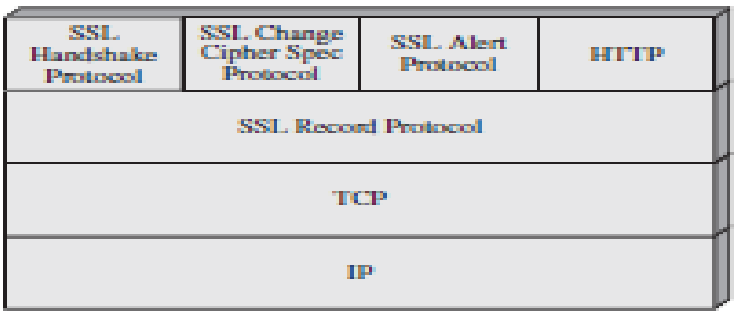
✓Exchange types (1M)

5 **Explain about WEB security. (13M)** BTL4 **(Apr/May 2011, Nov/Dec 2011, Nov/Dec 13, May/June 2015)**

Answer : Page : 510 – William Stallings

✓Secure socket layer

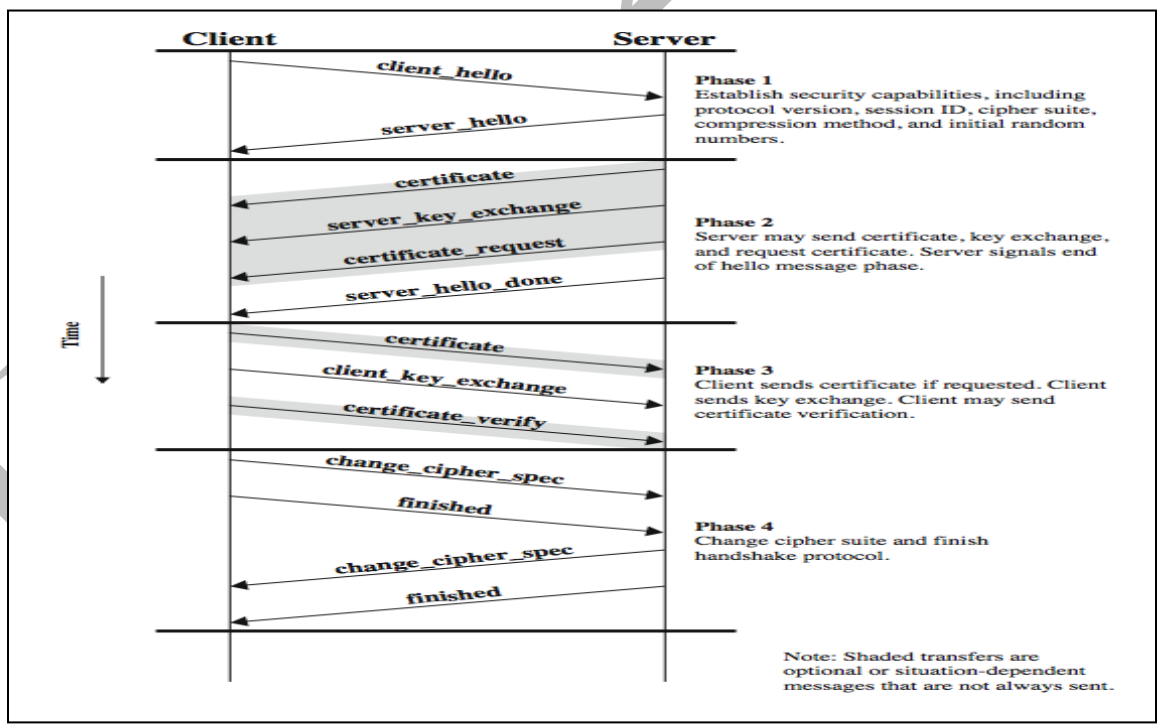
It is the standard security technology for establishing an encrypted link between a web server and a browser. This link ensures that all data passed between the web server and browsers remain private and integral. (2M)



✓How SSL works

After connection is made, the session key is used to encrypt all transmitted data. Browser connecte to a web serer secured with SSL and request the server identity. Server sends a copy of its SSL certificate (2M)

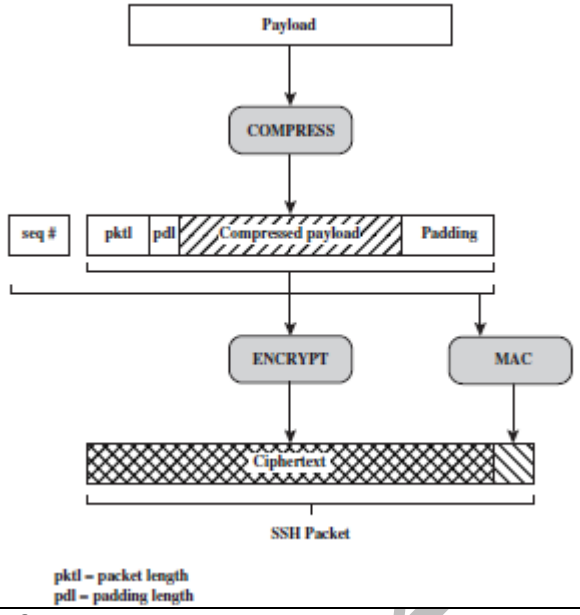
✓Handshake protocol (2M)



✓Change cipher spec protocol (1M)

✓Record protocol (1M)

✓Alert protocol (1M)

	✓Fatal alerts (2M) ✓Transport layer security (2M) Definition Architecture Parameter Architecture Diagram  pktl – packet length pdl – padding length
6	**Explain public key infrastructure. (13M)** BTL4 **(Nov/Dec 2013)** **Answer : Page : 515 – William Stallings** ✓It is a model for creating, distributing and revoking certificates based on X.509. A set of policies, processes, server platforms, software and workstations used for the purpose of administering certificates and public-private key pairs, including the ability to issue, maintain, and revoke public key certificates (1M) ✓End entity A generic term used to denote end users, devices (e.g., servers, routers), or any other entity that can be identified in the subject field of a public-key certificate. End entities typically consume and/or support PKIrelated services (1M) ✓Certification authority The issuer of certificates and (usually) certificate revocation lists (CRLs). It may also support a variety of administrative functions, although these are often delegated to one or more Registration Authorities. (2M) ✓Registration authority An optional component that can assume a number of administrative functions from the CA. The RA is often associated with the end entity registration process but can assist in a number of other areas as well. (2M)

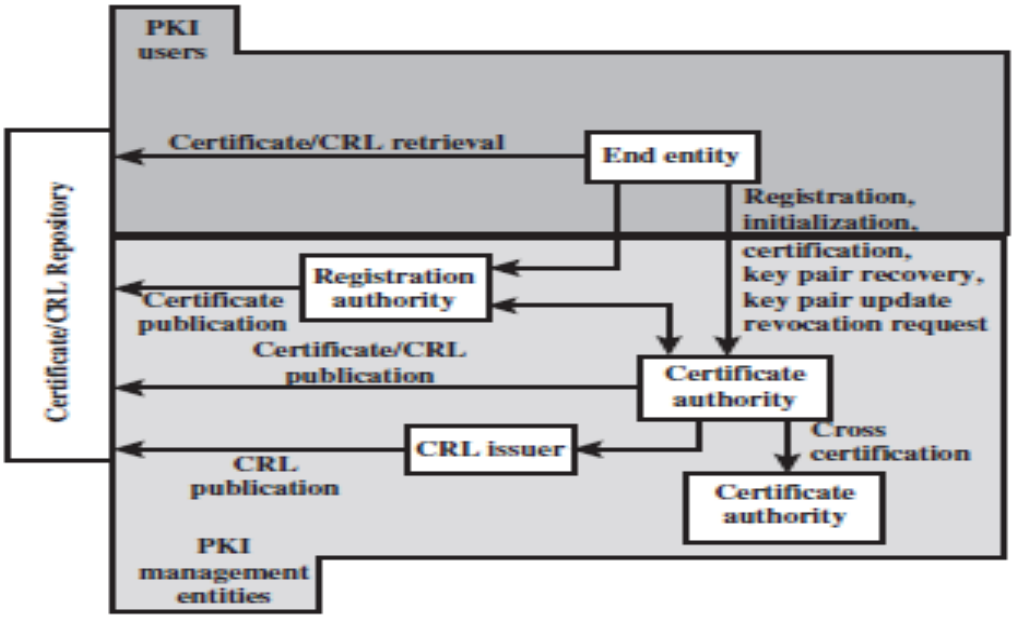
✓CRI issuer

An optional component that a CA can delegate to publish CRLs (1M)

✓Repository

A generic term used to denote any method for storing certificates and CRLs so that they can be retrieved by end entities. (1M)

✓PKI Architecture – Diagram (2M)



✓PKI management functions (2M)

Registration
Initialization
Certification
Key pair recovery
Key pair update
Revocation request
Cross certification

✓PKI management protocols (1M)

PART * C

1	**Explain E-mail security. (15M)** BTL4 **Answer : Page : 591 – William Stallings** ✓Security Services for E-mail ✓Possible Attacks through E-mail ✓Establishing Keys privacy ✓Authentication of source ✓Message Integrity ✓NonRepudiation ✓PGP ✓S/MIME	(2M) (2M) (2M) (2M) (2M) (1M) (2M) (2M)
2	**Explain IP Security. (15M)** BTL4 **Answer : Page : 639 – William Stallings** ✓Security policy Security Parameters Index (SPI) IP Destination Address Security Protocol Identifier ✓Encapsulating security payload Diagram Format Algorithm ✓Internet key exchange Manual Automated OKDP ISAKMP ✓Cryptographic suites ESP encryption ESP integrity IKE encryption IKE PRF IKE Integrity IKE DH group	(3M) (3M) (3M) (3M)

REGULATION: 2013 **ACADEMIC YEAR: 2019-2020**

MG6088 SOFTWARE PROJECT MANAGEMENT

L T P C
3 0 0 3

OBJECTIVES:

- To outline the need for Software Project Management
- To highlight different techniques for software cost estimation and activity planning.

UNIT I PROJECT EVALUATION AND PROJECT PLANNING 9

Importance of Software Project Management – Activities Methodologies – Categorization of Software Projects – Setting objectives – Management Principles – Management Control – Project portfolio Management – Cost-benefit evaluation technology – Risk evaluation – Strategic program Management – Stepwise Project Planning.

UNIT II PROJECT LIFE CYCLE AND EFFORT ESTIMATION 9

Software process and Process Models – Choice of Process models - mental delivery – Rapid Application development – Agile methods – Extreme Programming – SCRUM – Managing interactive processes –Basics of Software estimation – Effort and Cost estimation techniques – COSMIC Full function points - COCOMO II A Parametric Productivity Model - Staffing Pattern.

UNIT III ACTIVITY PLANNING AND RISK MANAGEMENT 9

Objectives of Activity planning – Project schedules – Activities – Sequencing and scheduling – Network Planning models – Forward Pass & Backward Pass techniques – Critical path (CRM) method – Risk identification – Assessment – Monitoring – PERT technique – Monte Carlo simulation – Resource Allocation – Creation of critical patterns – Cost schedules.

UNIT IV PROJECT MANAGEMENT AND CONTROL 9

Framework for Management and control – Collection of data Project termination – Visualizing progress – Cost monitoring – Earned Value Analysis- Project tracking – Change control- Software Configuration Management – Managing contracts – Contract Management.

UNIT V STAFFING IN SOFTWARE PROJECTS 9

Managing people – Organizational behavior – Best methods of staff selection – Motivation – The Oldham-Hackman job characteristic model – Ethical and Programmed concerns – Working in teams – Decision making – Team structures – Virtual teams – Communications genres – Communication plans. TOTAL: 45 PERIODS

OUTCOMES:

- At the end of the course the students will be able to practice Project Management principles while developing a software.

TEXTBOOK:

1. Bob Hughes, Mike Cotterell and Rajib Mall: Software Project Management – Fifth Edition, Tata McGraw Hill, New Delhi, 2012.

REFERENCES:

1. Robert K. Wysocki "Effective Software Project Management" – Wiley Publication,2011.
2. Walker Royce: "Software Project Management"- Addison-Wesley, 1998.
3. Gopalaswamy Ramesh, "Managing Global Software Projects" – McGraw Hill Education (India), Fourteenth Reprint 2013.

Subject Code: MG6088 **Year/Semester: IV /07**
Subject Name: SOFTWARE PROJECT MANAGEMENT **Subject Handler: R.ANNAMALAI**

UNIT I – PROJECT EVALUATION AND PROJECT PLANNING

Importance of Software Project Management – Activities Methodologies – Categorization of Software Projects – Setting objectives – Management Principles – Management Control – Project portfolio Management – Cost-benefit evaluation technology – Risk evaluation – Strategic program Management – Stepwise Project Planning.

PART * A

Q.No.	Questions
1	**What is a project?** BTL2 The dictionary definitions put a clear emphasis on the project being a planned activity. The other definitions include a Specific plan or design, planned undertaking and large undertaking.
2	**Define software project management.(May 14)** BTL1 Software project management is the art and science of planning and leading software projects. It is a sub-discipline of project management in which software projects are planned, implemented, monitored and controlled.
3	**What are the characteristics of a project?** BTL2 • Non-routine tasks are involved • Planning is required • Specific objectives are to be met • The project has a predetermined time span • Work is carried out for someone other than yourself • Work involves several specialism • People are formed into temporary work group
4	**What are the characteristics that make software projects different from other projects?** BTL2 Invisibility - Physical artifact is being constructed the progress being made can actually be seen. Complexity - software products contain more complexity than other engineered artifacts. Conformity - The 'traditional' engineer is usually working with physical.
5	**What are the three successive processes that bring a new system?** BTL2 • The feasibility study • Planning-Outline the structure of the project • Project Execution- Product Implementation activities.

6	**What are the phases in software development life cycle?** BTL2 • Requirement analysis • Architecture design • Detailed design

	• Code and test • Integration • Qualification testing • Installation
7	**List the various ways to categorize software projects. BTL1** • Compulsory versus voluntary projects • Information systems versus embedded systems • Outsourced projects • Object driven versus product driven development
8	**Who are project stakeholders? (May 15)** BTL2 These are people who have a stake or interest in the project. Stakeholders can be categorized as Internal to the project team External to the project team but within the same organization External to both the project and the organization.
9	**What is project steering committee? What are their roles?** BTL2 Overall authority over the project is often termed as project steering committee or project management board. The project manager runs the project on a day-to-day basis, but regularly reports to the steering committee. Roles: • Setting, monitoring and modifying objectives. • The project manager runs the project on a day-to-day basis, but regularly reports to the steering committee.
10	**What are the activities of management?** BTL2 • Planning –deciding what is to be done. • Organizing – making arrangements. • Staffing-selecting the right people for the job • Directing-giving instructions. • Monitoring – checking on progress • Controlling- taking action to remedy hold-ups
11	**Define SMART.** BTL1 S – Specific M – Measurable A – Achievable T – Time constrained
12	**What is Goals/sub-objectives?** BTL2 A goal can be allocated to an individual. Individual may have the capability of achieving goal, but not the objective on their own. A more appropriate goal or subobjective for the software developers would be to keep development costs within a certain budget.
13	**Define Management control.** BTL1 Management Control System is defined a 'set of policies and procedures designed to keep operations going according to plan.
14	**What is project evaluation?** BTL2 Project evaluation is a step by step process of collecting, recording and organizing information about Project results, short - term outputs (immediate results of activities or project deliverables) and Long – term outputs (changes in behavior, practice or policy resulting from the result.

15	Why is project evaluation important? BTL3 The following list of question will justify the project evaluation importance's • What progress has been made?

	• Were the desired outcomes achieved? Why? • Whether the project can be refined to achieve better outcomes? • Do the project results justify the project inputs?
16	**What is Project portfolio Management?** BTL2 Project Portfolio Management (PPM) is the centralized management of the processes, methods, and technologies used by project managers and project management offices(PMOs) to analyze and collectively manage current or proposed projects based on numerous key characteristics.
17	**What are the key aspects of Project portfolio Management?** BTL2 • Portfolio definition • Portfolio management • Portfolio optimization
18	**What is objective of a project?** BTL2 Informally, the objective of a project can be defined by completing the statement: The project will be regarded as a success "if " Rather like post-conditions for the project, Focus on what will be put in place, rather than how activities will be carried out.
19	**What are the steps in cost-benefit analysis?** BTL2 Cost –benefit analysis consists of two steps • Identifying and estimating all of the costs and benefits of carrying out the project and operating the delivered application. It includes development cost of system, Operating cost of system, Benefits obtained by system. • Expressing these costs and benefits in common units.
20	**What is net profit?** BTL2 The net profit of a project is the differences between the total costs and the total income over the life of the project. Advantage is easy to calculate and disadvantages are does not show profit relative to size investment
21	**What do you understand by payback period?(Dec 14)** BTL2 The payback period is the time taken to break even or pay back the initial investment. Normally, the project with the shortest payback period will be chosen on the basis that an organization will wish to minimize the time that a project is 'in debt'. Advantage: Simple to calculate, not sensitive to small forecasting errors. Disadvantage: Ignores the overall profitability of the project.
22	**What is Return on investment?** BTL2 It provides a way of comparing the net profitability to the investment required. A performance measure used to evaluate the efficiency of an investment or to compare the efficiency of a number of different investments.
23	**When Net present value is calculated for a project?** BTL3 The calculation of net present value is a project evaluation technique that takes into account the profitability of a project and the timing of cash flows that are produced. The NPV for a project is obtained by discounting each cash flow and summing the discounted values.
24	**What is the use of decision tree in Risk Evaluation?** BTL2 A decision tree is a diagramming analysis technique used to help select the best course of action in situations in which future outcomes are uncertain
25	**What is the concept of strategic programmes?** BTL2 Several projects together can implement a single strategy. For example the merging of two organizations' computer systems could require several projects each dealing with particular application area. Each activity could be treated as a distinct project, but would be coordinated as a programme.
	PART - B

1	**Explain the difference between software projects and other projects in detail. ? (13M) BTL2** **Answer Page: 4 - Bob Hughes, Mike Cotterell.** **Definition(2M)** When a physical artifact such as a bridge or road is being constructed the progress being made can actually be seen. With software, progress is not immediately visible. One way of perceiving software project management is as the process of making visible that which is invisible. **Key Factors (11M)** • Invisibility (2M) • Complexity(3M) • Conformity(3M) • Flexibility(3M)
2	**Explain the various software development life cycle activities as outlined by ISO 12207 with a neat diagram (13M) BTL2** **Answer Page: 6-Bob Hughes, Mike Cotterell.** **Definition(2M)** Information is gathered about the requirements of the proposed application. Requirements elicitation can, at least initially, be complex and difficult. The client and other stakeholders may be aware of the problems they wish to overcome and the aims they wish to pursue, but not be sure about the means of achievement. The probable developmental and operational costs, along with the value of the benefits of the new system, will also have to be estimated. **The feasibility study (11M)** • Planning • Project Planning • Project execution • Requirements analysis • Architecture design • Code and test • Integration • Qualification testing • Installation • Acceptance support

3	**What are the activities involved by management? List the problems with software projects?(13M) BTL2** **Answer Page: 16-Bob Hughes, Mike Cotterell.** **Definition (2M)** Management refers to determination of future course of action to achieve desired goals. It means deciding in advance what to do, how to do it, when to do it and who is to do it. It is an "executive action that embodies the skills of anticipating, influencing and controlling the nature and direction of change". Planning precedes all other functions of a manager**.** **Management Activities(11M)** • Planning – deciding what is to be done

	• Organizing – making arrangements • Staffing – selecting the right people for the job etc • Directing – giving instructions • Monitoring – checking on progress • Controlling – taking action to remedy hold-ups • Innovating – coming up with new solutions • Representing – liaising with clients, users, developer, suppliers and other Stakeholders
4	**Discuss about management control in detail. (13M) BTL1** **Answer Page: 16-Bob Hughes, Mike Cotterell..** **Definition (2M)** Management, in general, can be seen as the process of setting objectives for a system and then monitoring the system to see what its true performance is. In the 'real world' is shown as being rather formless. Especially in the case of large undertakings, there will be a lot going on about which management should be aware. This will involve the local managers in data collection. **Diagram(5M)** **Explanation(6M)**
5	**Explain in detail about setting objectives. (13M) BTL1** **Answer Page: 10-Bob Hughes, Mike Cotterell.** **Definition(2M)** An objective is a statement which describes what an individual, team or organisation is hoping to achieve. Objectives are 'SMART' if they are specific, measurable, achievable, realistic and, timely (or time-bound). **Objectives should be SMART (11M)** 1.Specific 2.Measurable 3.Achievable 4.Relevant 5. Time Constrained 6. Goals/sub-objectives 7. Measures of effectiveness
	PART *C
1	**Explain in detail about Project Portfolio Management. (15M) BTL1** **Answer Page:24- Bob Hughes, Mike Cotterell.** **Definition (2M)** Strategic and operational assessment carried by an organization on behalf of customer is called portfolio management [third party developers].They make use of assessment of any proposed project themselves. Objectives of Project Portfolio Management (2M) Benefits of Project Portfolio Management(2M) Project Portfolio Management Tools(2M) Techniques Used to Measure PPM(2M) Why Project Managers to Focus on PPM?(2M)

	The Five Question Model(3M)
2	**Explain in detail about strategic program management. (15M) BTL2** **Answer Page:38- Bob Hughes, Mike Cotterell.** **Definition (3M)** Strategic planning is an organization's process of defining its strategy, or direction, and making decisions on allocating its resources to pursue this strategy. In order to determine the direction of the organization, it is necessary to understand its current position and the possible avenues through which it can pursue a particular course of action. Strategic programming makes sense when the world is expected to hold still or change predictably while the intended strategies unfold, so that formulation can logically precede implementation. • Strategic Programmes (3M) • Strategic Project Management(3M) • The Process of Strategic Project Management(6M) 1. Know the direction of the project 2. Explain responsibilities 3. Project planning 4. The Relevance of Strategic Thinking to Project Management
3	**Explain the step-wise project planning in detail with suitable flowchart.(15M) BTL2** **Answer Page: 47-Bob Hughes, Mike Cotterell.** **Steps (8M)** Step 1: Identify project scope and objectives. Step 2: Identify project Infra structure. Step 3: Analyze project characteristics, High-level risks. Step 4: Identify project products and activities, Activity network for IOE Maintenance Accounts. Step 5: Estimate effort for each activity, IOE Maintenance Group Accounts- breaking activities Step 6: Identify activity risks. Step 7: Allocate Resources. Step 8: Review/Publicize plan, IOE existing quality standards Step 9 &10: Execute plan and lower levels of planning, lower level planning for individual modules. **Flow Chart (7M)**

UNIT II – PROJECT LIFE CYCLE AND EFFORT ESTIMATION

Software process and Process Models – Choice of Process models - mental delivery – Rapid Application development – Agile methods – Extreme Programming – SCRUM – Managing interactive processes – Basics of Software estimation – Effort and Cost estimation techniques– COSMIC Full function points - COCOMO II A Parametric Productivity Model - Staffing Pattern.

PART * A

Q.No.	Questions
1	**What is a software process model? BTL2** A Process Model describes the sequence of phases for the entire lifetime of a product. Therefore, it is sometimes also called Product Life Cycle. This covers everything from the initial commercial idea until the final de-installation or disassembling of the product after its use.
2	**What were the phases in software process model?** BTL2 There are three main phases: • Concept phase • Implementation phase • Maintenance phase Each of these main phases usually has some sub-phases, like a requirement engineering phase, a design phase, a build phase and a testing phase.
3	**List various software process models.** BTL1 • Waterfall model • Spiral model • V-model • Iterative model • Agile model • RAD model.
4	**Define RAD.** BTL1 RAD model is Rapid Application Development model. It is a type of incremental model. In RAD model the components or functions are developed in parallel as if they were mini projects. The developments are time boxed, delivered and then assembled into a working prototype.
5	**Write down the major aims of the RAD model.** BTL1 • To decrease the time taken and the cost incurred to develop software systems. • To limit the cost of accommodating change requests by incorporating them as early a possible before large investments have been made on development and testing.
6	**What are the phases in the rapid application development (RAD) model?** BTL2 • Business modeling • Data modeling • Process modeling • Application generation • Testing and turnover

7	**What are the advantages of the RAD model?** BTL2 • Reduced development time.

	• Increases reusability of components • Quick initial reviews occur • Encourages customer feedback • Integration from very beginning solves a lot of integration issues.
8	**Define Agile Methods.** BTL1 Agile model is a combination of iterative and incremental process models with focus on process adaptability and customer satisfaction by rapid delivery of working software product. Agile Methods break the product into small incremental builds. These builds are provided in iterations. Every iteration involves cross functional teams working simultaneously on various areas like planning, requirements analysis, design, coding, unit testing, and acceptance testing.
9	**List out the various agile approaches.** BTL1 • Crystal Technologies • Atern(formerly DSDM) • Feature-driven Development • Scrum • Extreme Programming(XP)
10	**What is extreme programming?** BTL2 Extreme programming (XP) is a software development methodology, which is intended to improv software quality and responsiveness to changing customer requirements. As a type of agile softwar development, it advocates frequent "releases" in short development cycles, to improve productivit and introduce checkpoints at which new customer requirements can be adopted.
11	**List the fundamental principles of extreme programming.** BTL1 The fundamental principles of Extreme Programming are • Rapid feedback • Assume simplicity • Incremental change • Embracing change and Quality work.
12	**What are the values of extreme programming?** BTL2 Extreme Programming (XP) is based on the five values • Communication • Simplicity • Feedback • Courage • Respect
13	**What are the limitations of extreme programming?** BTL2 • This becomes difficult where developers and users belong to different organizations. • Development staff need to be physically located in the same office. • Communication problems if the application does not have a visual interface. • Large, complex systems may initially need significant architectural effort.
14	**What is SCRUM?** BTL2 Scrum is an efficient framework within which you can develop software with teamwork. It is based on agile principles. Scrum supports continuous collaboration among the customer, team members, and relevant stakeholders.
15	**Define software estimation.** BTL1 Estimation techniques are of utmost importance in software development life cycle, where the time required to complete a particular task is estimated before a project begins. Estimation is the process

	of finding an estimate, or approximation, which is a value that can be used for some purpose even if input data may be incomplete, uncertain, or unstable.
16	**List out steps in software estimation.** BTL1 The four basic steps in Software Project Estimation are • Estimate the size of the development product. • Estimate the effort in person-months or person-hours. • Estimate the schedule in calendar months. • Estimate the project cost in agreed currency.
17	**What are software effort estimation techniques?** BTL2 • Algorithm models • Expert judgment • Analogy • Parkinson • Price to win • Top-down • Bottom-up
18	**Define COSMIC Full function points.** BTL1 COSMIC FFP – Common Software Measurement Consortium Full Function Point. COSMIC deals with decomposing the system architecture into a hierarchy of software layers.Unit is Cfsu(COSMIC functional size units).
19	**Write about COCOMO model.** BTL2 • Constructive Cost Model. • It refers to a group of models. • The basic model was built around the equation: Effort=c*sizek, • Where effort is measured in pm,or the number of 'person-months'.
20	**Define organic mode.** BTL1 Organic mode is the case when relatively small teams developed software in a highly familiar in-house environment and when the system being developed was small and the interface requirements were flexible.
21	**Define application composition.** BTL1 In application composition the external features of the system that the users will experience are designed. Prototyping will typically be employed to do this. With small application that can be built using high-productivity application building tools, development can stop at this point.
22	**List the steps of estimate effort.** BTL1 Step 1: Use Wideband Delphi Technique to construct WBS. We suggest that the tasks should not be more than 8 hrs. If a task is of larger duration, split it. Step 2: Use Wideband Delphi Technique or Three-point Estimation to arrive at the Effort Estimates for the Tasks.
23	**What is the use of COCOMO model and its types?** BTL2 COCOMO predicts the effort and schedule for a software product development based on inputs relating to the size of the software and a number of cost drivers that affect productivity. COCOMO has three different models that reflect the complexity: The Basic Model The Intermediate Model The Detailed Model

24	**Write any two advantages of function point analysis.** BTL1 • Improved project estimating • Understanding project and maintenance productivity • Managing changing project requirements

	• Gathering user requirements.
	PART - B
1	**Discuss in detail about software process and process models. (13M) BTL2** **Answer Page:75- Bob Hughes, Mike Cotterell.** **Definition(2M)** A software process is a set of activities that leads to the production of a software product. These activities may involve the development of software from scratch in a standard programming language like Java or C. Increasingly, however, new software is developed by extending and modifying existing systems and by configuring and integrating off-the-shelf software or system components. **Software process models (11M)** • The waterfall model (4M) • Fundamental development activities(4M) • Incremental development benefits(3M)
2	**Explain in detail about Rapid Application development. (13M) BTL2** **Answer Page: 87- Bob Hughes, Mike Cotterell.** **Definition(3M)** Rapid Application Development model relies on prototyping and rapid cycles of iterative development to speed up development and elicit early feedback from business users. After each iteration, developers can refine and validate the features with stakeholders. RAD model is also characterized by reiterative user testing and the re-use of software components. Hence, RAD has been instrumental in reducing the friction points in delivering successful enterprise applications. **Phases in RAD Model(10M)** • Business Modeling (2M) • Data Modeling (2M) • Process Modeling (2M) • Application Modeling (2M) • Testing and Turnover(2M)

3	**List the role and principles of extreme programming. (13M) BTL1** **Answer Page: 89-Bob Hughes, Mike Cotterell.** **Definition (2M)** Extreme Programming technique is very helpful when there is constantly changing demands or requirements from the customers or when they are not sure about the functionality of the system. It advocates frequent "releases" of the product in short development cycles, which inherently improves the productivity of the system and also introduces a checkpoint where any customer requirements can be easily implemented. The XP develops software keeping customer in the target. **There are six phases available in Agile XP method(6M)**

	• Planning • Analysis • Design • Execution • Wrapping • Closure **Roles(5M)** • Customer • Programmer • Coach • Tracker • Tester • Doomsayer • Manager • Gold owner
4	**Discuss about SCRUM process in detail. (13M) BTL1** **Answer Page: 92-Bob Hughes, Mike Cotterell..** **Definition (2M)** SCRUM is an agile development method which concentrates specifically on how to manage tasks within a team based development environment. Basically, Scrum is derived from activity that occurs during a rugby match. Scrum believes in empowering the development team and advocates working in small teams **Roles and Responsibilities(11M)** • Scrum Master • Product owner • Scrum Team • Product Backlog • Scrum Practices • Process flow of Scrum

5	**Explain in detail about Managing interactive processes. (13M)** BTL2 **Answer Page:93 - Bob Hughes, Mike Cotterell.** **Definition(2M)** Models are defined as explicit representations of some portions of reality as perceived by some actor. A model is active if it influences the reality it reflects; if changes to the representation also change the way some actors perceive reality. Model activation is the process by which a model affects reality. Activation involves actors interpreting the model and adjusting their behaviour to it. **The Potential of Interactive Process Models (11M)** • Articulation: Simple and User-Oriented Process Modelling (4M) • Activation: Customised and Integrated Software Support(4M) • Reuse: Process Knowledge Management (3M)

	PART *C
1	**Discuss in detail about basics of software estimation. (15M) BTL1** **Answer Page:103- Bob Hughes, Mike Cotterell.** **Definition (2M)** Estimate the size of the development product. This generally ends up in either Lines of Code (LOC) or Function Points (FP), but there are other possible units of measure. A discussion of the pros & cons of each is discussed in some of the material referenced at the end of this report. **The four basic steps in software project estimation are: (7M)** 1) Estimate the size of the development product. 2) Estimate the effort in person-months or person-hours. 3) Estimate the schedule in calendar months. 4) Estimate the project cost in dollars (or local currency) **Estimation Factors (6M)** • Estimating size • Estimating effort • Estimating schedule • Estimating Cost
2	**Discuss in detail about COSMIC full function points. (15M) BTL1** **Answer Page: 112-Bob Hughes, Mike Cotterell.** **Definition (2M)** Function Point Analysis (FPA) is one of the most widely used methods to determine the size of software projects. FPA originated at a time when only a mainframe environment was available. Sizing of specifications was typically based on functional decomposition and modeled data. Nowadays, development methods like Object Oriented, Component Based and RAD are applied more often. **COSMIC Concepts (13M)** COSMIC recognises 4 (types of) Data Movements: • Entry moves data from outside into the process (4M) • Exit moves data from the process to the outside world (3M) • Read moves data from persistent storage to the process (3M) • Write moves data from the process to persistent storage.(3M)

3	**Explain in about COCOMO II a parametric productivity model.** BTL2 **Answer Page:113- Bob Hughes, Mike Cotterell.** **Definition(3M)** COCOMO (Constructive Cost Estimation Model) was proposed by Boehm. According to him, any software development project can be classified into one of the following three categories based on the development complexity: organic, semidetached, and embedded. The classification is done considering the characteristics of the product as well as those of the development team and development environment. **COCOMO a parametric model(12M)**

	• Basic COCOMO Model(4M) • Intermediate COCOMO Model(4M) • Complete COCOMO Model(4M)
4	**Explain briefly about Staffing Pattern.** BTL2 **Answer Page: 118-Bob Hughes, Mike Cotterell.** **Definition(2M)** Resource allocation in software development is important and many methods have been proposed. Related empirical research is yet scarce and evidence is required to validate the theoretical methods. This paper introduces the staffing pattern as a metric of resource distribution among project phases, and verifies its effect on software quality and productivity using real project data. **Steps in Staffing Pattern (13M)** (1) Rapid-team-buildup pattern (abbreviated Rapid for later reference). (2) Fix-staff pattern (abbreviated Fix). (3) Design-construction-centric pattern (abbreviated Design). (4) Implementation-centric pattern (abbreviated Implement). (5) Test-centric pattern (abbreviated Test). (6) Classical-Rayleigh pattern (abbreviated Rayleigh). (7) Minimum-design pattern (abbreviated Mini Design).

UNIT III – ACTIVITY PLANNING AND RISK MANAGEMENT

Objectives of Activity planning – Project schedules – Activities – Sequencing and scheduling – Network Planning models – Forward Pass & Backward Pass techniques – Critical path (CRM) method – Risk identification – Assessment – Monitoring – PERT technique – Monte Carlo simulation – Resource Allocation – Creation of critical patterns – Cost schedules.

PART * A

Q.No.	Questions
1	**What are the objectives of activity planning?** BTL2 • Feasibility assessment • Resource allocation • Detailed costing • Motivation • Co-ordination
2	**Define Project Schedule.** BTL1 A stage of a larger project, the project plan must be developed to the level of showing dates when each activity should start and finish and when and how much of each resource will be required. Once the plan has been refined to this level of detail we call it a project schedule.
3	**What are the three approaches to identify the activities that make up a project?** BTL2 Essentially there are three approaches to identifying the activities or tasks that make up a project • The activity-based approach, • The product-based approach • The hybrid approach.
4	**Define activities.** BTL1 If an activity must have a clearly defined start and a clearly defined end-point, normally marked by the production of a tangible deliverable. An activity requires a resource (as most do) then that resource requirement must be forecast able and is assumed to be required at a constant level throughout the duration of the activity.
5	**What do you understand by work breakdown structure (WBS)? (Dec 14)** BTL2 This involves identifying the main (or high level) tasks required to complete a project and the breaking each of these down into set of lower-level tasks. **Five levels of WBS.** • Project • Deliverables • Components • work-packages • Tasks

6	**What are the rules for constructing precedence networks?** BTL2 • A project network should have only one start node. • A project network should have only one end node.

	• A node has duration. • Links normally have no duration. • Precedents are the immediate preceding activities.
7	**Define Hammock activities.** BTL1 Hammock activities which, in themselves, have zero duration but are assumed to start at the same time as the first 'ham mocked' activity and to end at the same time as the last one.
8	**What is meant by forward pass?** BTL2 The forward pass is carried out to calculate the earliest dates on which each activity may be started and completed. Significance-calculation method used in Critical Path Method.
9	**What is meant by backward pass?** BTL2 The second stage in the analysis of a critical path network is to carry out a backward pass to calculate the latest date at which each activity may be started and finished without delaying the end date of the project. The calculating the latest dates, we assume that the latest finish date for the project is the same as the earliest finish date- that is we wish to complete the project as early as possible.
10	**What is critical path?** BTL2 There will be at least one path through the network that defines the duration of the project. This i known as critical path. Any delay to any activity on this critical path will delay the completion of th project.
11	**What do you mean by activity-based approach?** BTL2 The activity based approach consists of creating a list of all the activities that the project is thought to evolve.
12	**What are the measures of activity float?** BTL2 Free float: the time by which an activity may be delayed without affecting any subsequent activity Interfering float: the difference between total float and free float. This is quite commonly used, particularly in association with the free float.
13	**Define activity float.** BTL1 The difference between an activity's earliest start date and its latest start date (or difference between an activity's earliest and latest finish dates) is known as the activity's float-it is measure of how much the start or completion of an activity may be delayed without affecting the end date of the project. Any activity with a float of zero is critical (any delay in carrying out the activity delay the completion date of the project as a whole.
14	**What is the significance of a critical path? (Dec 14)** BTL2 In managing the project, we must pay particular attention to monitoring activities on the critical path so that the effects of any delay or resource unavailability are detected and corrected at the earliest opportunities.In planning the project, it is the critical path that we must shorten if we are to reduce the overall duration of the project.
15	**Write any three network diagram methods.** BTL1 • PERT — Program evaluation and review technique. • CPM — Critical path method. • ADM — Arrow Diagramming method.
16	**Define Risk Identification.** BTL1 Risk management begins with analyzing the risks involved in the project. Risk identification is not a one-off initiative since projects are constantly evolving and new risks arise while other risks may dissipate or reduce in importance.
17	**What is meant by known Risk?** BTL2

	Risk is defined "an uncertain event or condition that, if it occurs has a positive or negative effect on a project objectives". It includes transferring the risk to another party, avoiding the risk, reducing the negative effect of the risk, and accepting some or all of the consequences of a particular risk.
18	**What is risk management?** BTL2 Risk management process begins when somebody asks what kind of events can damage the business and how much damage can be done. Identifying and measuring the potential loss exposures, choosing the most efficient methods of controlling and financing loss exposure and implementing them and finally monitoring all the outcomes are the main steps involved in Risk Management.
19	**List out the framework for dealing with risk.** BTL1 • Risk identification – what risks might there be? • Risk analysis and prioritization – which are the most serious risks? • Risk planning – what are we going to do about them? • Risk monitoring – what is the current state of the risk?
20	**List the factors used to identify the risk.** BTL1 Approaches to identifying risks include: • Use of checklists – usually based on the experience of past projects. • Brainstorming – getting knowledgeable stakeholders together to pool concerns. • Causal mapping – identifying possible chains of cause and effect.
21	**Define Risk Assessment.** BTL1 A systematic process of evaluating the potential risks that may be involved in a projected activity or undertaking.
22	**What is PERT?** BTL2 Project Evaluation and Review Technique (PERT) is a project management tool used to schedule, organize, and coordinate tasks within a project. It estimation considers three values: the most optimistic estimate (O), a most likely estimate (M), and a pessimistic estimate (least likely estimate (L)).
23	**List the advantages of PERT Technique.** BTL1 • Useful at many stages of project management • Mathematically simple • Give critical path and slack time • Provide project documentation • Useful in monitoring costs
24	**List out the components of Monte Carlo Simulation.** BTL1 • Probability Distribution Function. • Random Number Generation. • Sampling Rule. • Scoring/Tallying. • Error Estimation. • Parallelization.
25	**What is resource allocation?** BTL2 Resource Allocation is used to assign the variable resource in an economic way. In project management, resource allocation is the scheduling of activities and the resources required by those activities while taking into consideration both the resource availability and the project time.

26	**List out Burman's priority list.** BTL1 • Shortest critical activities • Other critical activities

	• Shortest non-critical activities • Non-critical activities with least float • Non-critical activities
27	**Define staff costs.** BTL1 Staff costs includes not just salary, but also social security contributions by the employer, holiday pay etc. Timesheets are often used to record actual hours spent on each project by an individual. One issue can be how time when a staff member is allocated and available to the project, but is not actually working on the project, is dealt with.
28	**Define Overheads costs.** BTL1 Overheads e.g. space rental, service charges etc. Some overheads might be directly attributable to the project, in other cases a percentage of departmental overheads may be allocated to project costs.
	PART - B
1	**Explain in detail about the objectives of activity planning? (13M) BTL2** **Answer Page: 127-Bob Hughes, Mike Cotterell.** **Definition(2M)** Ensure Appropriate resources available when required and avoid different competing for the same resources at the same time. It Produce a detailed schedule showing which staffs carry out each activity. Time cash flow forecast and replan the project during its life to correct drift from the target. **Objectives of activity planning (11M)** • Feasibility assessment(2M) • Resource allocation(2M) • Detailed costing(2M) • Motivation3M) • Co-ordination(2M)
2	**Explain in detail about the steps involved in project schedule. ?(13M) BTL2** **Answer Page: 128-Bob Hughes, Mike Cotterell.** **Steps(8M)** Step 1: Identify project scope and objectives. Step 2: Identify project Infra structure. Role of existing strategic plans, Step 3: Analyze project characteristics, High-level risks. Step 4: Identify project products and activities, Product break down structure, Step 5: Estimate effort for each activity, IOE Maintenance Group Accounts- breaking Step 6: Identify activity risks. Step 7: Allocate Resources. Step 8: Review/Publicize plan Step 9 &10: Execute plan and lower levels of planning, lower level planning for individual modules. **Diagram(5M)**

3	**Explain the different network planning models and Give example for precedence construction ?(13M) BTL2** **Answer Page:135- Bob Hughes, Mike Cotterell..** **Definition (2M)**

	The path taking longest time through this network of activities is called the "critical path." The critical path provides a wide range of scheduling information useful in managing a project. Critical Path Method (CPM) helps to identify the critical path(s) in the project networks. CPM with a Single Time Estimate CPM with Three Activity Time Estimates (a.k.a. PERT) **Example(6M)** • Time-Cost Models • CPM Assumptions/Limitations • Project Evaluation and Review Technique (PERT) • Evaluate the PERT techniques **Explanation(5M)** • Why Network Diagrams? • Backward Pass • Constructing a Project Network • Forward Pass Computation • Backward Pass Computation • Determining Slack (or Float) • Sensitivity of a Network
4	**Explain in detail about the risk identification. ?(13M) BTL1** **Answer Page:159 - Bob Hughes, Mike Cotterell.** **Definition(3M)** Risk identification Approaches to identifying risks include: • Use of checklists – usually based on the experience of past projects • Brainstorming – getting knowledgeable stakeholders together to pool concerns • Causal mapping – identifying possible chains of cause and effect **Boehm's top 10 development risks (10M)** • Personnel shortfalls • Unrealistic time and cost estimates • Developing the wrong software functions • Developing the wrong user interface • Gold plating • Late changes to requirements • Shortfalls in externally supplied components • Shortfalls in externally performed tasks • Real time performance problems • Development technically too difficult

5	**Write short notes on Resource Allocation and Cost Schedule. BTL1** **Answer Page: 194-Bob Hughes, Mike Cotterell.** **Definition(2M)** Resource allocation is the assignment of available resources to various uses. In the context of an entire economy, resources can be allocated by various means, such as markets or central planning.

	In project management, resource allocation or resource management is the scheduling of activities and the resources required by those activities while taking into consideration both the resource availability and the project time. **Resource Allocation Factors(11M)** • Nature of Resources • Identifying Resource Requirements • Scheduling Resources • Priorities resource allocation • Ordered list priority • Creating Critical Paths • Manage the allocation of resources within programmers • Cost Schedules • Cost profile • Accumulative costs • Balancing concerns
	PART *C
1	**Explain with an example how critical path can be identified in precedence networks? (15M) BTL1** **Answer Page: 191-Bob Hughes, Mike Cotterell.** **Definition (2M)** A project usually consists of multiple activities that occur both simultaneously and sequentially. To determine the flow of these activities, you'll need to create a Precedence Diagram. After creating the Precedence Diagram, you can identify the activities that would, if delayed, cause your project to come in late. This is the Critical Path definition. A delay in any of the critical path activities will delay the entire project, regardless of whether the other project activities are completed on or before time. **Path Identification(7M)** • Formulating a network model • Constructing Precedence network • Representing lagged activities • Hammock activities • Labeling conventions • Adding the time dimension Forward pass Backward pass **To determine the Critical Path and conduct Critical Path Analysis(6M)** • Define the duration of each activity. • Identify all the paths. • Calculate the duration of each path. • Identify the longest path. • Identifying the critical path
2	**Explain in detail formulating a network model.(15M)** BTL2 **Answer Page:135- Bob Hughes, Mike Cotterell.**

	Definition(2M) Formulating a network model The first stage in creating a network model is to represent the activities and their relationships as a graph. In activity-on-node we do this by representing activities as nodes in the graph-the lines between nodes represent dependencies. **Models(13M)** • Constructing precedence networks (4M) • Representing lagged activities(3M) • Hammock activities(3M) • Labeling conventions(3M)
3	**Explain how you will identify the major risks that might affect your project and identify the strategies for minimizing each of those risks (15M) BTL2** **Answer Page: 160-Bob Hughes, Mike Cotterell.** **Definition(3M)** Risk Evaluation After the potential risks have been identified, the project team then evaluates the risk based on the probability that the risk event will occur and the potential loss associated with the event. Not all risks are equal. Some risk events are more likely to happen than others, and the cost of a risk event can vary greatly. Evaluating the risk for probability of occurrence and the severity or the potential loss to the project is the next step in the risk management process. **Risk Analysis of Equipment Delivery (3M)** **Risk Mitigation (9M)** • Risk avoidance (2M) • Risk sharing (2M) • Risk reduction (3M) • Risk transfer(2M)

UNIT IV – PROJECT MANAGEMENT AND CONTROL

Framework for Management and control – Collection of data Project termination – Visualizing progress – Cost monitoring – Earned Value Analysis- Project tracking – Change control- Software Configuration Management – Managing contracts – Contract Management.

PART * A

Q.No.	Questions
1	**What are the categories of reporting? BTL2** • Oral formal regular: Weekly or monthly progress meetings • Oral formal ad hoc: End-of-stage meetings • Written formal regular: job sheets, progress reports • Written formal ad hoc: Exception reports, change reports • Oral informal ad hoc: Canteen discussion, social interaction
2	**What are the activities that are carried out in project termination process?** BTL2 • Project survey • Collection of objective information • Debriefing meeting • Final project review • Result publication
3	**What are the reasons for project termination?** BTL2 • Project is completed successfully and handed over to the customer. • Incomplete requirements • Lack of resources • Some key technologies used in the project have become obsolete during project execution. • Economics of the project has changed.
4	**What is the use of check points in monitoring?** BTL2 It is essential to set a series of checkpoints in the initial activity plan. Checkpoints may be regular, tied to specific events such as production of a report or other deliverable.
5	**Name the popular visual tools used for monitoring and tracking the project progress.** BTL1 • Gantt chart • Slip chart • Timeline • Ball chart
6	**What is Gantt chart?** BTL2 One of the simplest and oldest techniques for tracking project progress. An activity bar chart indicating scheduled activity dates and durations. Reported progress is recorded on the chart by shading activity bars .Today cursor provides visual indication of which activities are ahead or behind schedule.

	Disadvantage: do not show clearly the slippage of the project completion date through the life of the project.
7	**What is slip chart? Mention its use. (Dec 14)** BTL2 A slip chart is a very alternative favored by some project managers who believe it provides a more striking visual indication of those activities that are not progressing to schedule-the more the slip line bends, the greater variation from the plan. Additional slip lines are added at intervals and, as they built up, the project manager will gain an idea to whether the project is improving or not.
8	**What is the timeline chart?** BTL2 The timeline chart is a method of recording and displaying the way in which targets have changed throughout the duration of the project. The Planned time is plotted along the horizontal axis and elapsed time down the vertical axis. he lines meandering down the chart represent scheduled completion dates.
9	**State Earned value analysis** (May 14) BTL1 • Earned value analysis is based on assigning a value to each task or work package based on the original expenditure forecasts. • The assigned value is the original budgeted cost for the item and is known as the planned value (PV) or budgeted cost of work scheduled (BCWS) • The total value credited to a project at any point is known as the earned value (EV)or budgeted cost of work performed (BCWP)
10	**What forms the basis for cost performance measurement using Earned Value?** BTL2 Three quantities form the basis for cost performance measurement using Earned Value Management They are • Budgeted Cost of Work Scheduled (BCWS) or Planned Value (PV) • Budgeted Cost of Work Performed (BCWP) or Earned Value (EV) • Actual Cost of Work Performed (ACWP) or Actual Cost (AC).
11	**Define Software Configuration Management.** BTL1 Software configuration management (SCM) is a software-engineering discipline comprising the tools and techniques (processes or methodology) that a company uses to manage change to its software assets.
12	**Why Software Configuration Management in a project is essential?** BTL3 The following are some problems that can occur if a proper configuration management System is not used. • Problems associated with concurrent access • Undoing changes • System accounting • Handling variants • Accurate determination of project status
13	**Define Configuration Identification.** BTL1 Configuration identification involves deciding which parts of the system should be kept under configuration management. Project managers normally classify the work products associated with a software development process into three main categories controlled, pre-controlled and uncontrolled.
14	**Define Configuration Control.** BTL1 Configuration Control is part of a configuration management system that most directly affects the day-to-day operations of developers. This activity is used to ensure that the changes to a system occur smoothly.

15	**How work products are classified in software development process?** BTL3

	• Controlled • Pre-controlled • uncontrolled
16	**Define BCWP, BCWS.** BTL1 The total value credited to a project at any point is known as the earned value or budgeted cost of work performed(BCWP) and this can be represented as a value or as a percentage of the BCWS
17	**What is budget variance?** BTL2 Budget variance can be calculated as ACWP-BCWS and indicates the degree to which actual costs differ from those planned where the actual cost of each task can be collected as actual cost of work performed (ACWP).
18	**What are the types of contract?** BTL2 • Fixed Price Contracts • Time And Materials Contracts • Fixed Price Per Unit Delivered Contracts
19	**List out the contract for a completed software package.** BTL1 • Bespoke system-It's a system that is created from scratch specifically for one customer. • Off-the-shelf-this is sometimes referred to as shrink wrapped software. • Customized Off-the-shelf (COTS) software-this is a basic core system, which is modified to meet the needs of a particular customer.
20	**Define fixed price contracts.** BTL1 The price is fixed when the contract is signed. If there are no changes in the contract terms, this is the price they pay on completion. When the contract is to construct a software system, the detailed requirements analysis must already have been carried out. Once the development is under way the customer cannot change their requirements without renegotiating the price of the contract.
21	**List the advantages of fixed price contracts.** BTL1 • Known customer expenditure • Supplier motivation • Higher prices to allow for contingency • Difficulties in modifying requirements • Upward pressure on the cost of changes. • Threat to system quality
22	**List the disadvantages of fixed price contracts.** BTL1 • Higher prices to allow for contingency • Difficulties in modifying requirements • Upward pressure on the cost of changes • Threat to system quality
23	**Define time and materials contracts.** BTL1 In time and material contracts the customer is charged at a fixed rate per unit of effort, for ex per staff-hour. The supplier may provide an initial estimate of the cost based on their current understanding of the customer's requirements, but this is not the basis for final payment.
24	**Define fixed price per unit delivered contracts.** BTL1 This is associated with function point (FP) counting. The size of the system to be delivered is calculated or estimated at the outset of the project. The size could be estimated in lines of code, but FPs can be more easily derived from requirements documents.

25	**List the advantages of fixed price per unit delivered contracts.** BTL1 • Customer understanding • Comparability pricing schedules

	• Emerging functionality • Supplier efficiency • Life-cycle range
	PART - B
1	**Explain the framework for Management and control in detail. (13M) BTL2** **Answer Page:224- Bob Hughes, Mike Cotterell.** **Definition(2M)** Exercising control over a project and ensuring that targets are met is a matter of regular monitoring, finding out what is happening, and comparing it with current targets. If there is a mismatch between the planned outcomes and the actual one then either preplanning is needed to bring the project back on target or the target will have to be revised. **Project control cycle(11M)** • Creating the Framework(2M) • Responsibility(3M) • Assessing the Progress(2M) • Setting Checkpoints(2M) • Taking Snapshots(2M)
2	**Discuss in detail about collection of data. (13M) BTL1** **Answer Page:205- Bob Hughes, Mike Cotterell.** **Definition(2M)** Managers will try to break down long activities into more controllable tasks of one or two weeks' duration. However, it will still be necessary to gather information about partially completed activities and, in particular, forecasts of how much work is left to be completed. It may be difficult to make such forecasts accurately. Where there is a series of products, partial completion of activities is easier to estimate. Counting the number of record specifications or screen layouts produced, for example, can provide a reasonable measure of progress. Data Collection(4M) Partial Completion Reporting(4M) Risk Reporting(3M)
3	**Explain the various methods for visualizing the progress of a project. ?(13M) BTL1** **Answer Page:212- Bob Hughes, Mike Cotterell.** **Definition (2M)** Once data has been collected about project progress, a manager needs some way of presenting that data to greatest effect. Some of these methods such as Gantt charts provide a static picture, a single snapshot, whereas others such as time line charts try to show how the project has progressed and changed over time. **Methods(11M)** • Visualizing Progress(3M) • The Gantt Chart(2M) • The Slip Chart(2M) • Ball Charts(2M)

	• The Timeline(2M)
4	**Give the importance of cost monitoring in detail. 13M) BTL1** **Answer Page: 215-Bob Hughes, Mike Cotterell..** **Definition (2M)** Expenditure monitoring is a vital component of project control because it provides an indication of the effort that has gone into a project. A project might be on time but only because more money has been spent on activities than originally budgeted. **Project Management(11M)** • Project Definition • Project Planning • Project Execution • Project Control • Project Completion • Project Cost Control • Project Budget • Cost Tracking • Time Management • Project Change Control • Collecting Project Cost Control Data
5	**Explain the method Earned value Analysis. (13M) BTL1** **Answer Page:216- Bob Hughes, Mike Cotterell.** **Definition(2M)** Earned value analysis is based on assigning a 'value' to each task or work package as identified in the work breakdown structure (WBS) based on the original expenditure forecasts. The assigned value is the original budgeted cost for the item and is known as the planned value (PV) or budgeted cost of work scheduled (BCWS). A task that has not started is assigned the value zero and when it has been completed, it, and hence the project, is credited with the value of the task. Activities(8M) • Monitoring Earned Value • Schedule Variance • Cost Variance • Performance Ratios

	• What are the stages in contract management? • Requirement analysis • Evaluation plan • Invitation to tender • Evaluation of proposal **Typical terms in contract management (3M)** • Form of agreement • Goods and services to be supplied • Environment

	• Customer commitment • Standards • Timetable
	PART *C
1	**Discuss in detail about project termination. (15M) BTL2** **Answer Page: 211-Bob Hughes, Mike Cotterell.** **Definition (2M)** Project termination is one of the most serious decisions a project management team and its control board have to take. It causes frustration for those stakeholders who sincerely believed - and in most cases still believe – that the project could produce the results they expected, or still expect. The project manager and his or her team members, very important stakeholders of the project as well, will feel that they personally failed. They also will be scared of negative consequences for their careers; their motivation and consequently, productivity will decrease significantly. **Reasons Why Project Termination Becomes Necessary (13M)** • Technical reasons • Requirements or specifications of the project result are not clear or unrealistic • Requirements or specifications change fundamentally so that the underlying contract cannot be changed accordingly • Lack of project planning, especially risk management • The intended result or product of the project becomes obsolete, is not any longer needed • Adequate human resources, tools, or material are not available • The project profit becomes significantly lower than expected, due to too high project cost or too low project revenue • The parent organization does not longer exist

2	**Discuss the types of contract with example. (15M).BTL1** **Answer Page:234- Bob Hughes, Mike Cotterell.** **Definition(2M)** A contract is an agreement between two parties that creates an obligation to perform (or not perform) a particular duty. As the name implies, in this situation a price is fixed when the contract is signed. In other words when the contract is to construct a s/w system, the detailed requirements analysis must already have been carried out. **Types of contract (8M)** • Fixed price contracts • Time and materials contract • Fixed price per delivered unit contracts • Advantages and Dis Advantages **Another way to categorize contract (5M)** • Open • Restricted • Negotiated

UNIT V – STAFFING IN SOFTWARE PROJECTS

Managing people – Organizational behavior – Best methods of staff selection – Motivation – The Oldham-Hackman job characteristic model – Ethical and Programmed concerns – Working in teams – Decision making – Team structures – Virtual teams – Communications genres – Communication plans.

PART * A

Q.No.	Questions
1	**What are the concerns in Managing People In Software Environments?** BTL2 • Staff Selection • Staff Development • Staff Motivation • Well-being Staff during course of project
2	**What are the three basic objectives of organizational behavior? (May 14)** BTL2 • To select the best people for the job. • To instruct them in the best methods. • To give instructions in the form of higher wages to the best workers.
3	**How do you select the right persons for the job?** BTL2 • Determining your need to hire a new employee. • Conducting a thorough job analysis. • Writing a job description and job specification for the position based on the job analysis. • Determining the salary for the position, based on internal and external equity. • Deciding where and how to find qualified applicants. • Checking references and Hiring the best person for the job.
4	**Write the general approach might be followed in the recruitment process.** BTL1 • Create a job specification • Create a job holder profile • Obtain applicants • Examine CVs • Interviews and Other procedures.
5	**List the various models of motivation.** BTL1 • The Taylorist model • Maslow's hierarchy of needs • Herzberg's two-factor theory • The expectancy theory of motivation
6	**What is Taylorist model?** BTL2 Taylor had a simple view about what motivated people at work - money. He felt that workers should get a fair day's pay for a fair day's work, and that pay should be linked to the amount produced (e.g. piece-rates). Workers who did not deliver a fair day's work would be paid less (or nothing). Workers who did more than a fair day's work (e.g. exceeded the target) would be paid more.

7	**What is "Maslow's hierarchy of needs? (May 12,15)** BTL2

	• Physiological Needs - attention turns to safety and security • Security or Safety Needs- Calculation, Domain, Consulting, • Affiliation or Social Needs - Developing New Programs • Esteem Needs- needs for esteem can become dominant • Self-actualization Needs - include symmetry
8	**State Herzberg's two factor theory.** BTL1 Job satisfaction by Herzberg and his associates found two sets of factors about a job • Hygiene or maintenance factors - which can make you dissatisfied if they are not right for example the level of pay or the working conditions • Motivators - which make you, feel that the job is worthwhile, like a sense of achievement or the challenge of the work itself.
9	**What is expectancy theory of motivation?** BTL2 It identifies three influences on motivation • Expectancy: the belief that working harder will lead to a better performances • Instrumentality: the belief that better performance will be rewarded • Valence: of the resulting reward
10	**What are the factors to be considered in the Oldham-hackman job characteristic ?** BTL2 • Skill variety- one or more of the offerings available from a variety of organizations • Task variety- enhance Key words • Task significance- autonomy, and feedback from the job • Autonomy- for Consulting & Software Companies • Feedback- submit your comments and suggestions
11	**Mention the methods of improving motivation.** BTL1 To improve motivation the manager might do the following • Set specific goals • Provide feedback • Consider job design.
12	**What are the measures used to enhance job design?** BTL2 • Job Enlargement • Job Enrichment
13	**Define Job Enlargement.** BTL1 Job enlargement expands job horizontally. It increases job scope; that is, it increases the number of different operations required in a job and the frequency with which the job cycle is repeated. By increasing the number of tasks an individual performs, job enlargement, increases the job scope, or job diversity.
14	**Define Job Enrichment.** BTL1 The job holder carries out that are normally done at a managerial or supervisory level. With programmers in a maintenance team they might be given authority to accept requests for changes that involve then five day's work without the need for their manager's approval.
15	**What are the measures to reduce the disadvantages of group decision making?** BTL2 • The cooperation of a number of experts. • The problem is presented to the experts. • The experts record their recommendations. • These recommendations are collated and reproduced. • The collect responses are recirculated.

16	**What are the various stages of development of a team?** BTL2 • Forming

	• Storming • Norming • Performing • Adjourning • Storming
17	**Define team worker.** BTL1 Skilled at creating a good working environment to manage all the people who are developing Projects, team proposed to extend these concepts.
18	**What are the two categorized for decision making?** BTL2 • Structured- generally relatively simple, routine Decisions where rules can be applied in a fairly straightforward way • Unstructured- more complex and often requiring a degree of creativity.
19	**Mention some mental obstacles to good decision making.** BTL1 • Faulty heuristics- is an innovative effort by students and members of staff • Escalation of commitment- behaviour, sunk cost, risk propensity, risk perception, • Information overhead- developers analyze, design, and develop software.
20	**Define team structure.** BTL1 Team structure denotes the reporting, responsibility and communication structures in individual project teams. There are mainly three formal team structures: • Chief programmer, • Democratic, • The mixed control team organizations
21	**Define Chief Programmer Team.** BTL1 In this team organization, a senior engineer provides the technical leadership and is designated as the chief programmer. The chief programmer partitions the task into small activities and assigns them to the team members. He also verifies and integrates the products developed by different team members.
22	**Define Democratic Team.** BTL1 The democratic team structure, as the name implies, does not enforce any formal team hierarchy. Decisions are taken based on discussions, where any member is free to discuss with any other matters. Typically, a manager provides the administrative leadership. At different times, different members of the group provide technical leadership
23	**Define the mixed control team organizations.** BTL1 The mixed team organization, as the name implies, draws upon the ideas from both the democratic organization and the chief-programmer organization. This team organization incorporates both hierarchical reporting and democratic set up. The democratic arrangement at the senior engineer's level is used to decompose the problem into small parts
24	**What do you understand by virtual teams?** BTL2 A virtual team (also known as a geographically dispersed team, distributed team, or remote team) is a group of individuals who work across time, space and organizational boundaries with links strengthened by webs of communication technology.
25	**What is a communication genre?** BTL2 Communication genres refer to methods of communication. This goes beyond technologies used and includes the organizational conventions involved in the communication. It can be selected and developed to deal with particular need for project coordination.
	PART - B

1	**Explain the recruitment process (or) Describe the recruitment process for choosing the right person for a job (or) Explain how new staff can be selected and induced into a project.? (13M)** BTL2 **Answer Page:253- Bob Hughes, Mike Cotterell.** **Definition(3M)** It must be stressed that often project leader have little choice about the people who will make up their team. A GENERAL APPROACH • Create a job specification: advice is often needed as there could be legal implications in an official document. • Create a job holder profile: it is used to construct a profile of the person needed to carry out the job. • Obtain applicants: an advertisement would be placed, either within the organization in the trade. • By giving the salary, location, job scope and any essential qualification, the applicants will be limited to the more realistic candidates. **Steps: Initial Contact from the Client(10M)** • Job Specification • Detailed brief • Timescales and Process • Search and selection • Arras One-to-One interview • Shortlisting • Interview management • Offers • Start
2	**Discuss about the different models of Motivation. (May 2015) (Dec 2014)(May 2014) (May 2013)? (13M)** BTL2 **Answer Page:255- Bob Hughes, Mike Cotterell.** **Definition(2M)** Motivation in management describes ways in which managers promote productivity in their employees. Learn about this topic, several theories of management, and ways in which this applies to the workplace. Use quiz questions to test your knowledge. The various models of motivation are: • The Taylorist model(3M) • Maslow's hierarchy of needs (3M) • Herzberg's two-factor theory (3M) • The expectancy theory of motivation(2M)
3	**Explain the expectancy theory of motivation. ?(13M)** BTL1 **Answer Page:255-Bob Hughes, Mike Cotterell.** **Definition (2M)**

	Expectancy theory proposes that an individual will decide to behave or act in a certain way because they are motivated to select a specific behavior over other behaviors due to what they expect the result of that selected behavior will be. The Expectancy Theory of Motivation explains the behavioral process of why individuals choose one behavioral option over another. It also explains how they make decisions to achieve the end they value. **Three components of Expectancy theory: (11M)** Expectancy, Instrumentality, and Valence 1. Expectancy: Effort → Performance (E→P) (3M) 2. Instrumentality: Performance → Outcome (P→O) (3M) 3. Valence: V(R) (3M) Motivational Force (MF) = Expectancy x Instrumentality x Valence (2M)
4	**Explain the Oldham-Hackman job characteristics model in detail.?(13M)** BTL1 **Answer Page: 258-Bob Hughes, Mike Cotterell.** **Definition (2M)** The job characteristics model, designed by Hackman and Oldham, is based on the idea that the task itself is key to employee motivation. Specifically, a boring and monotonous job stifles motivation to perform well, whereas a challenging job enhances motivation. Variety, autonomy and decision authority are three ways of adding challenge to a job. Job enrichment and job rotation are the two ways of adding variety and challenge. Meaningfulness of work Responsibility Knowledge of outcomes **Oldham and Hackman suggest that the satisfaction that the job gives is based on 5 factors.(5M)** • Skill variety • Task identity • Task significance • Autonomy • Feedback **Methods of improving motivation(6M)** • Set specific goal • Provide feedback • Consider job design Various measurements of job design: • Simplification of Job • Job Enlargement • Job Rotation • Job Enrichment

5	**Explain ethical and professional concerns. (13M)** BTL1 **Answer Page:260- Bob Hughes, Mike Cotterell.** **Definition(2M)** Ethics relates to the moral obligation to respect the rights and interests of others – goes beyond strictly legal responsibilities. Small business owners should treat all employees with the same

	respect, regardless of their race, religion, cultures or lifestyles. Everyone should also have equal chances for promotions. One way to promote uniform treatment in organizations is through sensitivity training. **Three groups of responsibilities (11M)** • Organizational ethics (2M) • Uniform Treatment(2M) • Social Responsibility(2M) • Financial Ethics(2M) • Considerations(2M) • Professional ethics(2M)
	PART *C
1	**Explain in detail about team structure. (15M)** BTL1 **Answer Page: Bob Hughes, Mike Cotterell.** **Definition (2M)** Team structure addresses the issue of organization of the individual project teams. There are mainly three formal team structures: • Chief programmer, • Democratic, and • The mixed control team organizations Management structure (5M) Communication path (5M) The mixed control team organizations (5M)

2	**Explain communication plans and virtual teams. (15M)** BTL1 **Answer Page: Bob Hughes, Mike Cotterell.** **Definition (2M)** A communications plan, in project management, is a policy-driven approach to providing stakeholders with information about a project. The plan formally defines who should be given specific information, when that information should be delivered and what communication channels will be used to deliver the information. **Communication Plan Activities(7M)** • Audience • Information Needs • Media • Timing • Responsibilities **ii) Virtual Team (6M)** A Virtual Team – also known as a Geographically Dispersed Team (GDT) – is a group of individuals who work across time, space, and organizational boundaries with links strengthened by webs of communication technology. They have complementary skills and are committed to a common purpose, have interdependent performance goals, and share an approach to work for which they hold themselves mutually accountable. Why Virtual Teams?

	• Best employees may be located anywhere in the world. • Workers demand personal flexibility. • Workers demand increasing technological sophistication. • A flexible organization is more competitive and responsive to the marketplace.