18CSC206J SOFTWARE ENGINEERING AND PROJECT MANAGEMENT

UNIT-I

INTRODUCTION TO SOFTWARE ENGINEERING AND SOFTWARE PROJECT MANAGEMENT

1 MARKS

S.NO	QUESTION	LEVEL	CLO	PG. NO
1.	Define Software. a) Software is set of programs b) Software is documentation and configuration of data **c) Software is set of programs, documentation & configuration of data** d) none of the mentioned	1	1	6
2.	"Software engineers should not use their technical skills to *misuse* other people's computers. "Here the term *misuse* refers to a) Unauthorized access to computer material b) Unauthorized modification of computer material c) Dissemination of viruses or other malware **d) All of the mentioned**	1	1	12
3.	The below one that does not account for software failure. a) Increasing Demand b) Low expectation **c) Increasing Supply** d) Less reliable and expensive	1	1	11
4.	Select the one that does not affect different types of software as a whole? a) Heterogeneity b) **Flexibility** c) Business and social change d) Security	1	1	70
5.	Build & Fix Model is suitable for programming exercises of _____ LOC (Line of Code). **a) 100-200** b) 200-400 c) 400-1000 d) above 1000	1	1	88
6.	Identify one of the following models is not suitable for accommodating any change. a) Build & Fix Model b) Prototyping Model c) RAD Model **d) Waterfall Model**	1	1	28
7.	Identify the one is not the types of prototype of Prototyping Model. a) Horizontal Prototype b) Vertical Prototype **c) Diagonal Prototype** d) Domain Prototype	1	1	30
8.	Identify the model can be selected if user is involved in all the phases of	1	1	34

SDLC.
a) Waterfall Model
b) Prototyping Model
c) RAD Model
d) both Prototyping Model & RAD Model

9.	SDLC stands for **a) Software Development Life Cycle** b) System Development Life cycle c) Software Design Life Cycle d) System Design Life Cycle	1	1	36
10.	List the major drawback of using RAD Model. a) Highly specialized & skilled developers/designers are required b) Increases reusability of components c) Encourages customer/client feedback **d) Increases reusability of components, Highly specialized & skilled developers/designers are required**	1	1	32
11.	RAD Model has a) 2 phases b) 3 phase **c) 5 phases** d) 6 phases	1	1	32
12.	Identify the one of the following is not an Evolutionary Process Model. a) WINWIN Spiral Model b) Incremental Model c) Concurrent Development Model **d) All of the mentioned**	1	1	34
13.	The Incremental Model is a result of combination of elements of which two models. a) Build & FIX Model & Waterfall Model b) Linear Model & RAD Model **c) Linear Model & Prototyping Model** d) Waterfall Model & RAD Model	1	1	36
14.	Choose the major advantage of using Incremental Model. a) Customer can respond to each increment b) Easier to test and debug c) It is used when there is a need to get a product to the market early **d) Easier to test and debug & It is used when there is a need to get a product to the market early**	1	1	36
15.	The spiral model was originally proposed by a) IBM **b) Barry Boehm** c) Pressman d) Royce	1	1	36
16.	The spiral model has two dimensions namely _____ and _____[CLO-1] [T1 Page no:37] a) diagonal, angular	1	1	37

b) radial, perpendicular
c) radial, angular
d) diagonal, perpendicular

17.	Recognize WINWIN Spiral Model different from Spiral Model. a) It defines tasks required to define resources, timelines, and other project related information **b) It defines a set of negotiation activities at the beginning of each pass around the spiral** c) It defines tasks required to assess both technical and management risks d) It defines tasks required to construct, test, install, and provide user support	1	1	38
18.	Identify the disadvantage of Spiral Model. **a) Doesn't work well for smaller projects** b) High amount of risk analysis c) Strong approval and documentation control d) Additional Functionality can be added at a later date	1	1	39
19.	If you were to create client/server applications, which model would you go for. a) WINWIN Spiral Model b) Spiral Model **c) Concurrent Model** d) Incremental Mode	1	1	41
20.	Selection of a model is based on a) Requirements b) Development team & Users c) Project type and associated risk **d) All of the mentioned**	1	1	56
21.	Identify two models don't allow defining requirements early in the cycle. a) Waterfall & RAD **b) Prototyping & Spiral** c) Prototyping & RAD d) Waterfall & Spiral	1	1	44
22.	Identify the following life cycle model can be chosen if the development team has less experience on similar projects. **a) Spiral** b) Waterfall c) RAD d) Iterative Enhancement Model	1	1	42
23.	If you were a lead developer of a software company and you are asked to submit a project/product within a stipulated time-frame with no cost barriers, which model would you select. a) Waterfall b) Spiral **c) RAD** d) Incremental	1	1	32
24.	Identify the two of the following models will not be able to give the desired outcome if user's participation is not involved.	1	1	30

a) Waterfall & Spiral
b) RAD & Spiral
c) RAD & Waterfall
d) RAD & Prototyping

25. A company is developing an advance version of their current software available in the market, what model approach would they prefer. 1 1 44
a) RAD
b) Iterative Enhancement
c) Both RAD & Iterative Enhancement
d) Spiral

26. Spiral Model has high reliability requirements. 1 1 46
a) True
b) False

27. Choose one of the following is not a software process quality. 1 1 57
a) Productivity
b) Portability
c) Timeliness
d) Visibility

28. _____&_____ are two kinds of software products. 1 1 57
[CLO-1] [T1 Page no: 57]
a) CAD, CAM
b) Firmware, Embedded
c) Generic, Customized
d) None of the mentioned

29. Identify one of the following is not an application of embedded software product. 1 1 58
a) keypad control of a security system
b) pattern recognition game playing
c) digital function of dashboard display in a car
d) none of the mentioned

30. Purpose of process is to deliver software 1 1 61
a) in time
b) with acceptable quality
c) that is cost efficient
d) both in time & with acceptable quality

31. The work associated with software engineering can be categorized into three generic phases, regardless of application area, project size, or complexity namely the_____ phase which focuses on *what*, the_____ phase which focuses on *how* and the_____ phase which focuses on *change*. 1 1 68
i. support
ii. Development
iii. Definition
a) 1, 2, 3
b) 2, 1, 3
c) 3, 2, 1
d) 3, 1, 2

	Identify the following activities of a Generic Process framework provides a feedback report. a) Communication b) Planning c) Modeling & Construction **d) Deployment**	1	1	57
33.	32. Identify one of the following is not an Umbrella Activity that complements the five process framework activities and help team manage and control progress, quality, change, and risk. a) Reusability management b) Risk management c) Measurement **d) User Reviews**	1	1	23
34.	Four types of change are encountered during the support phase. Identify one of the following is not one that falls into such category. a) Translation b) Correction c) Adaptation d) Prevention	1	1	22
35.	Choose an internal software quality from given below: a) scalability b) usability **c) reusability** d) reliability	1	1	95
36.	RUP stands for_____ created by a division of _____ a) Rational Unified Program, IBM b) Rational Unified Process, Infosys c) Rational Unified Process, Microsoft **d) Rational Unified Process, IBM**	1	1	57
37.	Name the phase of the RUP is used to establish a business case for the system. a) Transition b) Elaboration c) Construction **d) Inception**	1	1	51
38.	The longer a fault exists in software a) the more tedious its removal becomes b) the more costly it is to detect and correct c) the less likely it is to be properly corrected **d) All of the mentioned**	1	1	42
39.	Select the option that suits the Manifesto for Agile Software Development a) Individuals and interactions b) Working software c) Customer collaboration **d) All of the mentioned**	1	1	59
40.	Agile Software Development is based on a) Incremental Development	1	1	59

b) Iterative Development
c) Linear Development
d) Both Incremental and Iterative Development

41. Identify the following is not an agile method. 1 1 60
a) XP
b) 4GT
c) AUP
d) All of the mentioned

42. Determine plan driven development different from agile development. 1 1 63
a) Outputs are decided through a process of negotiation during the software development process
b) Specification, design, implementation and testing are interleaved
c) Iteration occurs within activities
d) All of the mentioned

43. Number of phases is there in Scrum. 1 1 72
a) Two
b) Three
c) Four
d) Scrum is an agile method which means it does not have phases

44. Identify the following does not apply to agility to a software process. 1 1 62
a) Uses incremental product delivery strategy
b) Only essential work products are produced
c) Eliminate the use of project planning and testing
d) All of the mentioned

45. Determine three framework activities are present in Adaptive Software Development (ASD). 1 1 76
a) analysis, design, coding
b) requirements gathering, adaptive cycle planning, iterative development
c) speculation, collaboration, learning
d) all of the mentioned

46. In agile development it is more important to build software that meets the customers' needs today than worry about features that might be needed in the future. 1 1 66
a) True
b) False

47. In XP, as soon as the work on a task is complete, it is integrated into the whole system. 1 1 65
a) True
b) False

48. User requirements are expressed as _____ in Extreme Programming. 1 1 66
a) implementation tasks
b) functionalities
c) scenarios
d) none of the mentioned

49. 48. Will a customer involved test development and validation in XP. 1 1 66
a) Yes

b) No
c) It may vary from Customer to Customer
d) None of the mentioned

50. List the four framework activities are found in the Extreme Programming (XP). 1 1 66
a) analysis, design, coding, testing
b) planning, analysis, design, coding
c) planning, design, coding, testing
d) planning, analysis, coding, testing

4 MARKS:

1. Define software project? L1 CLO2

A Software Project is the complete procedure of software development from requirement gathering to testing and maintenance, carried out according to the execution methodologies, in a specified period of time to achieve intended software product.

2. What is the need for software project management? L2 CLO2

Software is said to be an intangible product. Software development is a kind of all new stream in world business and there's very little experience in building software products. Most software products are tailor made to fit client's requirements. The most important is that the underlying technology changes and advances so frequently and rapidly that experience of one product may not be applied to the other one. All such business and environmental constraints bring risk in software development hence it is essential to manage software projects efficiently.

It is necessary for an organization to deliver quality product, keeping the cost within client's budget constrain and deliver the project as per scheduled. Hence in order, software project management is necessary to incorporate user requirements along with budget and time constraints.

3. What is software project planning? L1 CLO2

Software project planning is task, which is performed before the production of software actually starts. It is there for the software production but involves no concrete activity that has any direction connection with software production; rather it is a set of multiple processes, which facilitates software production.

4. Mention the uses of prototyping paradigm L2 CLO2

Prototype methodology is defined as a Software Development model in which a prototype is built, tests, and then reworked when needed until an acceptable prototype is achieved. It also creates a base to produce the final system.

Software prototyping model works best in scenarios where the project's requirement are not known. It is an iterative, trial, and error method which take place between the developer and the client.

5. Mention the disadvantages of water fall model. L2 CLO2

Once an application is in the **testing** stage, it is very difficult to go back and change something that was not well-thought out in the concept stage.

No working software is produced until late during the life cycle.

High amounts of risk and uncertainty.

Not a good model for complex and object-oriented projects.

Poor model for long and ongoing projects.

Not suitable for the projects where requirements are at a moderate to high risk of changing.

6. Identify the stages involved in a typical project life cycle L2 CLO2

Requirements analysis, Specification, Design, Coding , Verification & Validation, Implementation installation, Maintenance & Support

7. Discuss the advantages of spiral model L2 CLO2

The main advantages of spiral model is, it is realistic and typifies most software development products/projects. It combines the best features of most of the earlier models. It strikes a good balance mechanism for early problem identification and correction while not missing out proactive problem prevention.

8. Difference between verification and validation L2 CLO2

Verification	Validation
1. **Verification** is a static practice of verifying documents, design, code and program.	1. **Validation** is a dynamic mechanism of validating and testing the actual product.
2. It does not involve executing the code.	2. It always involves executing the code.
3. It is human based checking of documents and files.	3. It is computer based execution of program.
4. **Verification** uses methods like inspections, reviews, walkthroughs, and Desk-checking etc.	4. **Validation** uses methods like black box (functional) testing, gray box testing, and white box (structural) testing etc.
5. **Verification** is to check whether the software conforms to specifications.	5. **Validation** is to check whether software meets the customer expectations and requirements.
6. It can catch errors that validation cannot catch. It is low level exercise.	6. It can catch errors that verification cannot catch. It is High Level Exercise.
7. Target is requirements specification, application and software architecture, high level, complete design, and database design etc.	7. Target is actual product-a unit, a module, a bent of integrated modules, and effective final product.

9. When to use RAD model? L2 CLO2

RAD should be used when there is a need to create a system that can be modularized in 2-3 months of time. It should be used if there's high availability of designers for modeling and the budget is high enough to afford their cost along with the cost of automated code generating tools.

RAD SDLC model should be chosen only if resources with high business knowledge are available and there is a need to produce the system in a short span of time (2-3 months).

10. List out the merits of incremental model. L1 CLO2

The merits of incremental model are :

The incremental model can be adopted when there are less number of people

involved in the project.

Technical risks can be managed with each increment.

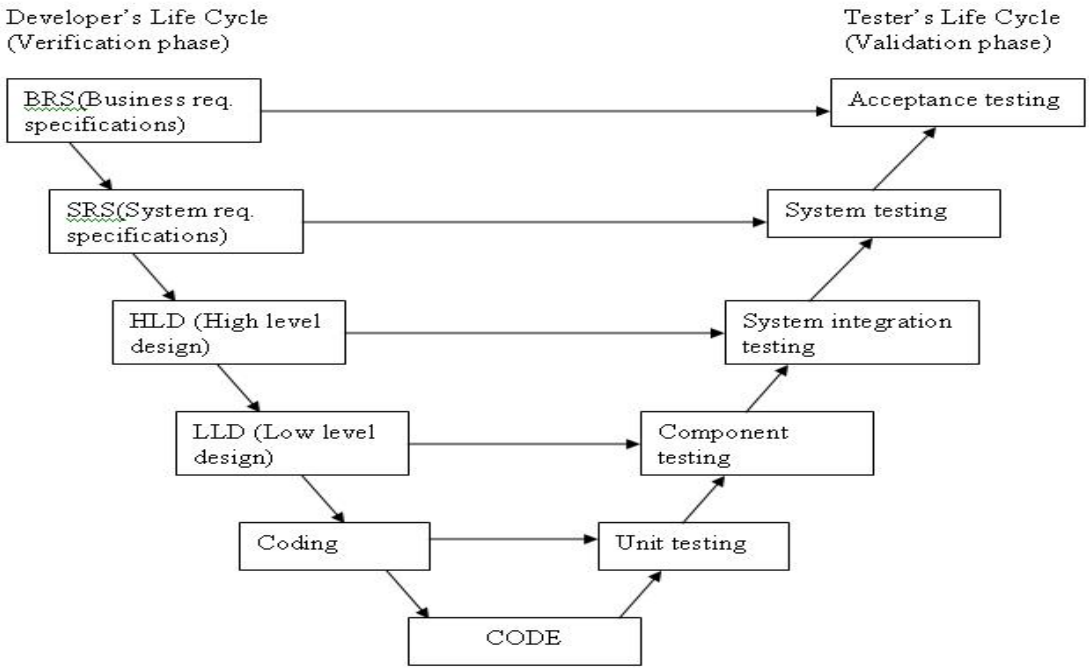
For a very small time span, at least core product can be delivered to the customer.

11. Analyze the characteristics which makes software projects different from other project? L2 CLO2

Invisibility: 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. **Complexity**: Per dollar, pound or euro spent, software products contain more complexity than other engineered artifacts.
Flexibility: The ease with which software can be changed is usually seen as one of its strengths. However this means that where the software system interfaces with a physical or organizational system, it is expected that, where necessary, the software will change to accommodate the other components rather than vice versa. This means the software systems are likely to be subject to a high degree of change

12. What is V-model? L1 CLO2

V- Model means Verification and Validation model. V-Shaped life cycle is a sequential path of execution of processes. Each phase must be completed before the next phase begins.



13. List out the differences between waterfall model and spiral model L2 CLO2

1	**WATERFALL MODEL**	**SPIRAL MODEL**
	Waterfall model works in sequential method.	While spiral model works in evolutionary method.
	In waterfall model errors or risks are identified and rectified after the completion of stages.	In spiral model errors or risks are identified and rectified earlier.
	Waterfall model is adopted by customers.	While spiral model is adopted by developers.

There is high amount risk in waterfall model. There is low amount risk in spiral model.

14. Explain Scrum? L2 CLO2

Scrum principles are consistent with the agile manifesto and are used to guide development activities within a process that incorporates the following framework activities: requirements, analysis, design, evolution, and delivery. Within each framework activity, work tasks occur within a process pattern (discussed in the following paragraph) called a sprint. The work conducted within a sprint (the number of sprints required for each framework activity will vary depending on product complexity and size) is adapted to the problem at hand and is defined and often modified in real time by the Scrum team. The overall flow of the Scrum process is illustrated

15. What is requirement engineering? L1 CLO2

The broad spectrum of tasks and techniques that lead to an understanding of requirements is called requirements engineering. From a software process perspective, requirements engineering is a major software engineering action that begins during the communication activity and continues into the modeling activity

Requirements engineering builds a bridge to design and construction.

Requirements engineering provides the appropriate mechanism for understanding what the customer wants, analyzing need, assessing feasibility, negotiating a reasonable solution, specifying the solution unambiguously, validating the specification, and managing the requirements as they are transformed into an operational system

16. List out the tasks included in requirement engineering L2 CLO2

inception, elicitation, elaboration, negotiation, specification, validation, and management.

17. Define requirement elicitation L1 CLO2

Requirements elicitation (also called requirements gathering) combines elements of problem solving, elaboration, negotiation, and specification. In order to encourage a collaborative, team-oriented approach to requirements gathering, stakeholders work together to identify the problem, propose elements of the solution, negotiate different approaches and specify a preliminary set of solution requirements

18. List out the different approaches to collaborative requirements gathering. L2 CLO2

Meetings are conducted and attended by both software engineers and other stakeholders.

Rules for preparation and participation are established.

An agenda is suggested that is formal enough to cover all important points but informal enough to encourage the free flow of ideas.

A “facilitator” (can be a customer, a developer, or an outsider) controls the meeting.

A "definition mechanism" (can be work sheets, flip charts, or wall stickers or an electronic bulletin board, chat room, or virtual forum) is used.

19. What are the different techniques to estimate the size of a program L2 CLO2

Two techniques to estimate size of program:-

1. LOC (Line Of Code) -- A line of code is any line of program text that is not a comment or blank line, regardless of the number of statements or fragments of statements on the line. This specifically includes all line containing program header, declarations, executable and nonexecutable statements.

2. Function count – It measures the functionality from the user's point of view that is on the basis of what the user request and receives in return. Therefore it deals with the functionality being delivered and not with the line of code, source modules, files etc.

20. Define COCOMO model? L1 CLO2

The Constructive Cost Model (COCOMO) is an algorithmic software cost estimation model developed by Barry W. Boehm. The model uses a basic regression formula with parameters that are derived from historical project data and current as well as future project characteristics. COCOMO consists of a hierarchy of three increasingly detailed and accurate forms. The first level, Basic COCOMO is good for quick, early, rough order of magnitude estimates of software costs, but its accuracy is limited due to its lack of factors to account for difference in project attributes (Cost Drivers). Intermediate COCOMO takes these Cost Drivers into account and Detailed COCOMO additionally accounts for the influence of individual project phases.

21. Outline the umbrella activities of a software process? L2 CLO2

The umbrella activities of a software process are:
Software project tracking and control.
Risk Management.
Software Quality Assurance.
Formal Technical Reviews
Software Configuration Management
Work product preparation and production
Reusability management, Measurement.

22. Which of the software engineering paradigms would be most effective? Why? L2 CLO2

Incremental / Spiral model will be most effective.
Reasons :

It combines linear sequential model with iterative nature of prototyping.

Focuses on delivery of product at each increment.

Can be planned to manage technical risks.

23. What is Risk and explain the risk management process. L2 CLO2

"Risk" is a problem that could cause some loss or threaten the progress of the project, but which has not happened yet. These potential issues might harm cost, schedule or technical success of the project and the quality of our software device, or project team morale.

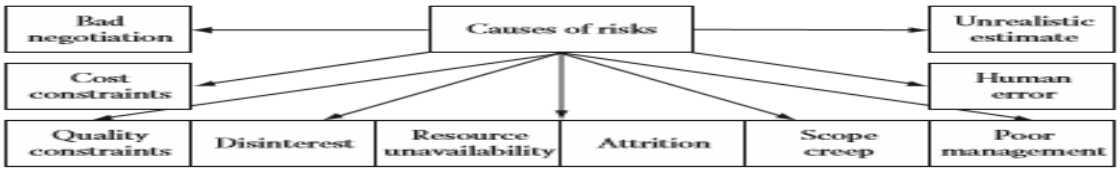
Risk Management is the system of identifying addressing and eliminating these problems before they can damage the project.

24. Illustrate the types of risks. L2 CLO2

There are different types of risks which can affect a software project:

Resource risk
Technology risk
Budget risk
Quality risk
Time risk

25. Find out the causes of risk L2 CLO2



12 Marks:

1. What are the major differences between system engineering and software engineering? State explains the stages that distinguish the two. L2 CLO2
2. Explain with two examples of software development projects would be amenable to evolutionary prototyping. Why is evolutionary prototyping suitable in these cases? L2 CLO2
3. Explain Water fall Model. What are the problems that are sometimes encountered when the waterfall model is applied? L2 CLO2
4. Which is more important-the product or process? Justify your answer. L2 CLO2
5. With suitable illustration explain SPIRAL model evolutionary software development. L2 CLO2
6. Explain the Evolutionary and Incremental Model. What are the Advantages and Disadvantages? L2 CLO2
7. Write short notes on System engineering and Computer based System. L2 CLO2
8. Explain System Engineering hierarchy. What are the restraining factors to construct a system model? L2 CLO2
9. Explain Component Based Development model in detail L2 CLO2
10. How do you differentiate software engineering from system engineering? L2 CLO2

11. Explain in detail the following s/w process models with a neat diagram. L2 CLO2
    i) Evolutionary process model. ii) Incremental Process model.
12. Explain the spiral model? What is the task region in the spiral model? How does the customer wins by getting the system or product that satisfy the majority of the customer's needs and the developer wins by working to realistic and achievable budgets and deadline? L2 CLO2
13. What are the necessities of Life cycle model? Elaborate on the various issues of Software life cycle. L2 CLO2
14. How does system engineering differ from software engineering? Also write brief notes on computer based system and system engineering hierarchy. L2 CLO2
15. Differentiate product engineering and business engineering overview L2 CLO2

16. Explain the process model that combines the element of waterfall and iterative fashion. L2 CLO2

17. Explain briefly about the following (i) business process engineering (ii) product engineering. L2 CLO2
18. Explain briefly about the following (i) Computer based system (ii) System engineering process. L2 CLO2