



**Maratha Vidya Prasarak Samaj's**

**Rajarshi Shahu Maharaj Polytechnic, Nashik**

**Udoji Maratha Boarding Campus, Near Pumping Station, Gangapur Road, Nashik-13.**

**Affiliated to MSBTE Mumbai, Approved by AICTE New Delhi, DTE Mumbai & Govt. of Maharashtra, Mumbai.**

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*Subject: - Software  
Engineering (22413)*



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# SYLLABUS

<b>Chapter No.</b>	<b>Name of chapter</b>	<b>Marks</b>
<b>1</b>	Software Development Process	<b>12</b>
<b>2</b>	Software Requirement Engineering	<b>14</b>
<b>3</b>	Software Modelling and Design	<b>14</b>
<b>4</b>	Software Project Estimation	<b>16</b>
<b>5</b>	Software Quality assurance and security	<b>14</b>
<b>Total Marks: -</b>		<b>70</b>



# **BOARD THEORY PAPER**

## **PATTERN**

### **FOR SEN (22413)**

<b>Q.1</b>		<b>Attempt any FIVE</b>	<b>5*2=10</b>
	<b>a)</b>	Software development process	
	<b>b)</b>	Software development process	
	<b>c)</b>	Software requirement engineering	
	<b>d)</b>	Software modeling and design	
	<b>e)</b>	Software project estimation	
	<b>f)</b>	Software project estimation	
	<b>g)</b>	Software quality assurance and security	
<b>Q.2</b>		<b>Attempt any THREE</b>	<b>3*4=12</b>
	<b>a)</b>	Software development process	
	<b>b)</b>	Software modeling and design	
	<b>c)</b>	Software project estimation	
	<b>d)</b>	Software quality assurance and security	
<b>Q.3</b>		<b>Attempt any THREE</b>	<b>3*4=12</b>



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	a)	Software development process
	b)	Software project estimation
	c)	Software project estimation
	d)	Software quality assurance and security
<b>Q.4</b>		<b>Attempt any TWO</b> <span style="float: right;"><b>3*6=12</b></span>
	a)	Software requirement engineering
	b)	Software project estimation
	c)	Software quality assurance and security
	d)	Software quality assurance and security
<b>Q.5</b>		<b>Attempt any TWO</b> <span style="float: right;"><b>2*6=12</b></span>
	a)	Software development process
	b)	Software requirement engineering
	c)	Software project estimation
<b>Q.6</b>		<b>Attempt any TWO</b> <span style="float: right;"><b>2*6=12</b></span>
	a)	Software modeling and design
	b)	Software project estimation
	c)	Software quality assurance and security



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# CLASS TEST - I

## PAPER PATTERN

**COURSE: - Software Engineering (22413)**

**PROGRAMME: - Information Technology**

**Syllabus: -**

Unit No.	Name of the Unit	Course Outcome (CO)
1	Software development process	CO-413-1
2	Software requirement engineering	CO-413-2
3	Software modeling and design	CO-413-3

Q.1	Attempt any FOUR 4*2=8Marks	Course Outcome (CO)
a)	Software development process	CO-413.1
b)	Software requirement engineering	CO-413.2
c)	Software modeling and design	CO-413.3
d)	Software development process	CO-413.1
e)	Software requirement engineering	CO-413.2
f)	Software requirement engineering	CO-413.2
Q.2	Attempt any Two 2*6=12 Marks	
a)	Software development process	CO-413.1
b)	Software requirement engineering	CO-413.2
c)	Software modeling and design	CO-218.3



# **CLASS TEST - II**

## **PAPER PATTERN**

**COURSE: -Software Engineering (22413))**

**PROGRAMME: - Information Technology**

**Syllabus: -**

<b>Unit No.</b>	<b>Name of the Unit</b>	<b>Course Outcome (CO)</b>
<b>4</b>	Software modeling and design	<b>CO-413-3</b>
<b>5</b>	Software project estimation	<b>CO-413-4</b>
<b>6</b>	Software quality assurance and security	<b>CO-413-5</b>

<b>Q.1</b>	<b>Attempt any FOUR</b>	<b>4*2=8Marks</b>	<b>Course Outcome (CO)</b>
<b>a)</b>	Software modeling and design		(CO-413.3)
<b>b)</b>	Software project estimation		(CO-413.4)
<b>c)</b>	Software quality assurance and security		(CO-413.4)
<b>d)</b>	Software project estimation		(CO-413.5)
<b>e)</b>	Software quality assurance and security		(CO-413.5)
<b>f)</b>	Software quality assurance and security		(CO-413.5)
<b>Q.2</b>	<b>Attempt any Two</b>	<b>2*6=12 Marks</b>	
<b>a)</b>	Software modeling and design		(CO-413.3)
<b>b)</b>	Software project estimation		(CO-413.4)
<b>c)</b>	Software quality assurance and security		(CO-413.5)



# **COURSE OUTCOME**

## **(CO)**

**COURSE: - Software Engineering (22413)**

**PROGRAMME: - Information Technology**

<b>CO. NO.</b>	<b>Course Outcome</b>
CO-413.01	Select suitable software process model for software development .
CO-413.02	Prepare software requirement specification.
CO-413.03	Use software modeling to create data designing.
CO-413.04	Estimate size and cost of software product.
CO-413.05	Apply project management and quality assurance principles in software development.



# 1. Software Development Process

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**Position in Question Paper**

**Total Marks-12**

Q.1. a) 2-Marks.

Q.1. b) 2-Marks.

Q.2. b) 4-Marks.

Q.3. a) 4-Marks.

Q.5. a) 6-Marks

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## **Descriptive Question**

1. Define software and state its characteristic.
2. Compare system software and application software.
3. Define software engineering and its objective.
4. Explain the layered approach of software engineering.
5. Give the need of software process.
6. State and explain various types of software process.
7. Explain the umbrella activities.
8. Explain the need of feasibility study and state its types.
9. List out the advantages and drawbacks of incremental model.
10. Compare waterfall model and spiral model.
11. Explain agility in detail.
12. Explain XP in detail.
13. Write a short note on FDD.
14. Write a short note on DSDM.
15. Explain the scrum approach with need of sprints..





## MCQ Question

(Total number of Question=Marks\*3=12\*3=36)

Note: Correct answer is marked with **bold**.

1. What is the disadvantage of the Spiral Model.
  - a) **Does n't work well for smaller project**
  - b) The high amount of risk analysis
  - c) Additional Functionality can be added later
  - d) Strong approval and documentation control
2. RAD Software process model stands for what?
  - a) **Rapid Application Development.**
  - b) Relative Application Development
  - c) Recent Application Development.
  - d) Recent Application Development.
3. The spiral model was the first time proposed by
  - a) Pressman
  - b) Royce
  - c) IBM
  - d) **Barry Boehm**
4. Which of the one is not an Evolutionary Process Model?
  - a) Concurrent Development Model
  - b) Incremental Mode
  - c) "WINWIN Spiral Model
  - d) **All of the above**
5. What is the most important use of the incremental model?
  - a) Customers can respond to each increment
  - b) Easier to test and debug
  - c) To use it when we need to get a product to the market early
  - d) **Easier to test and debug & use it when we need to get a product to the market early**
6. The incremental model is the combination of which models?.
  - a) Build & FIX Model & waterfall model
  - b) Linear model & waterfall model
  - c) **Linear model & Prototyping model**
  - d) linear model & RAD Model
7. Which of the options is correct for the prototyping model of software development?
  - a) For projects with large development teams.
  - b) When requirements are well defined.
  - c) **When a customer cannot define requirements clearly.**
  - d) both a & b
8. In which model the requirements are implemented b through its category?



- a) **Evolutionary Development Model**  
b) Waterfall Model  
c) Prototyping  
d) Iterative Enhancement Model
9. The spiral model has two dimensions namely \_\_\_ and \_\_\_  
a) diagonal, perpendicular  
b) radial, perpendicular  
c) **radial, angular**  
d) diagonal, angular
10. The rapid application development model is  
a) Another name for component model  
b) A useful approach when a customer cannot define requirement delay  
c) **a high speed adaption of the linear sequential model**  
d) all of the above
11. The waterfall model of software development is?  
a) a good approach when a working program is required quickly  
b) the best approach to use for projects with large development teams  
c) an old fashioned model that is rarely use  
d) **a reasonable approach when requirements are well defined**
12. Evolutionary software process model  
a) Are iterative in nature  
b) can easily accommodate product requirement changes  
c) Do not generally produce throwaway system  
d) All of the above
13. The concurrent development model is  
a) another name for concurrent engineering  
b) defines event that trigger engineering activity state transition  
c) only used for development of parallel or distributed systems  
d) **both a & b**
14. The component based development model is  
a) **only appropriate for computer hardware design**  
b) not able to support the development of reusable components  
c) Depend on object technologies for support  
d) not cost effective
15. What is 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**
16. How is Incremental Model different from Spiral Model?



- a) **Progress can be measured for Incremental Model**  
b) Changing requirements can be accommodated in Incremental Model  
c) Users can see the system early in Incremental Model  
d) All of the mentioned
17. 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 Model
18. Which of the following activities of a Generic Process framework provides a feedback report?  
a) Communication  
b) Planning  
c) **Deployment**  
d) Modeling & Construction
19. Which 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) **User Reviews**  
c) Risk management  
d) Measurement
20. Purpose of process is to deliver software  
a) in time  
b) with acceptable quality  
c) that is cost efficient  
d) **both in time & with acceptable quality**
21. Which one of the following is not a software process quality?  
a) Productivity  
b) **Portability**  
c) Timeliness  
d) Visibility
22. 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**
23. How many phases are there in Scrum?  
a) Two  
b) **Three**  
c) Four  
d) None
24. Agile Software Development is based on?  
a) Incremental Development  
b) Iterative Development  
c) Linear Development  
d) **Both Incremental and Iterative Development**
25. Agility is defined as the ability of a project team to respond rapidly to a change.  
a) True  
b) **False**
26. How is plan driven development different from agile development?

- 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
27. How many phases are there in Scrum?
- a) Two
- b) Three**
- c) Four
- d) Scrum is an agile method which means it does not have phases
28. Which three framework activities are present in Adaptive Software Development(ASD) ?
- a) analysis, design, coding
- b) requirements gathering, adaptive cycle planning, iterative development
- c) speculation, collaboration, learning**
- d) s1.00000
29. Which of the following does not apply to agility to a software process?
- 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
30. Which of the following does not apply to agility to a software process?
- 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
31. Which of the following does not apply to agility to a software process?
- 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
32. Agile methods seem to work best when team members have a relatively high skill level.?
- a) True
- b) False**
33. Incremental development in Extreme Programming (XP) is supported through a system release once every month.
- a) True
- b) False**



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34. In XP Increments are delivered to customers every \_\_\_\_\_ weeks.
- a) One
  - b) Two**
  - c) Three
  - d) Four
35. User requirements are expressed as \_\_\_\_\_ in Extreme Programming
- a) implementation tasks
  - b) functionalities
  - c) scenarios**
  - d) none of the mentioned
36. In XP an automated unit test framework is used to write tests for a new piece of functionality before that functionality itself is implemented.
- a) True**
  - b) False



## 2. Software Requirement Engineering

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**Position in Question Paper**

**Total Marks-14**

**Q.1. c) 2-Marks.**

**Q.4. a) 4-Marks**

**Q.5. b) 6-Marks.**

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### **Descriptive Question**

1. Explain the issues of requirement gathering.
2. Explain SRS with its needs and benefits.
3. Explain the different techniques of requirement gathering.
4. Describe the requirement gathering tasks.
5. Give the need of Requirement validation.
6. Explain requirement management.
7. List out various stakeholders involved in requirement analysis.
8. Write an SRS for ATM machine with functional and non-functional requirements.



## MCQ Question

(Total number of Question=Marks\*3=14\*3=42)

Note: Correct answer is marked with **bold**

1. What are the types of requirements?
  - a) Availability.
  - b) Reliability.
  - c) Usability
  - d) All the above.**
2. Select the developer-specific requirement?
  - a) Portability
  - b) Maintainability.
  - c) Availability
  - d) Both Portability and Maintainability**
3. Which one of the following is not a step of requirement engineering?
  - a) elicitation
  - b) design**
  - c) analysis
  - d) documentation
4. The user system requirements are the parts of which document?
  - a) SDD
  - b) SRS**
  - c) DDD
  - d) SRD
5. A stakeholder is anyone who will purchase the completed software system under development
  - a) True
  - b) False**
6. Functional requirements capture the intended behavior of the system.
  - a) True
  - b) False**
7. How many classification schemes have been developed for NFRs?
  - a) Two
  - b) Three
  - c) Four
  - d) Five**
8. Choose the incorrect statement with respect to Non-Functional Requirement(NFR).
  - a) Product-oriented Approach – Focus on system (or software) quality
  - b) Process-oriented Approach – Focus on how NFRs can be used in the design process
  - c) Quantitative Approach – Find measurable scales for the functionality attributes**
  - d) Qualitative Approach – Study various relationships between quality goals
9. Consider a system where, a heat sensor detects an intrusion and alerts the security company.” What kind of a requirement the system is providing?
  - a) Functional**
  - b) Non-Functional
  - c) Known Requirement
  - d) None of the mentioned
10. Which one of the following is a requirement that fits in a developer’s module ?



- a) continue  
**b) Testability**
- c) Usability  
d) Flexibility
11. Which of the following statements explains portability in non-functional requirements?  
**a) It is a degree to which software running on one platform can easily be converted to run on another platform**  
b) It cannot be enhanced by using languages, OS' and tools that are universally available and standardized  
c) The ability of the system to behave consistently in a user-acceptable manner when operating within the environment for which the system was intended  
d) None of the mentioned.
12. What is the first step of requirement elicitation ?  
**a) Identifying Stakeholder**  
b) Listing out Requirements  
c) Requirements Gathering  
d) All the above
13. Which of the following property does not correspond to a good Software Requirements Specification (SRS)?  
a) Verifiable  
**b) Ambiguous**  
c) Complete  
d) Traceable
14. Which of the following property of SRS is depicted by the statement: "Conformity to a standard is maintained" ?  
a) Correct  
b) Complete  
c) Consistent  
d) Modifiable
15. The SRS is said to be consistent if and only if.  
a) its structure and style are such that any changes to the requirements can be made easily while retaining the style and structure  
b) every requirement stated therein is one that the software shall meet  
c) every requirement stated therein is verifiable  
**d) no subset of individual requirements described in it conflict with each other**
16. Which of the following statements about SRS is/are true ?  
i) SRS is written by customer  
ii) SRS is written by a developer  
iii) SRS serves as a contract between customer and developer  
a) Only i is true  
b) Both ii and iii are true  
**c) All are true**  
d) None of the above
17. The SRS document is also known as \_\_\_\_\_ specification.?  
a) black-box  
**b) white -box**  
c) grey-box  
d) none
18. Which of the following is included in SRS?  
a) Cost  
b) Design Constraints  
c) Staffing  
d) delivery schedule





19. Which of the following is not included in SRS?
- a) Performance
  - b) Functionality
  - c) **Design solutions**
  - d) External Interfaces
20. Arrange the given sequence to form a SRS Prototype outline as per IEEE SRS Standard.?
- i. General description
  - ii. Introduction
  - iii. Index
  - iv. Appendices
  - v. Specific Requirements
- a) iii, i, ii, v, iv
  - b) iii, ii, i, v, iv
  - c) **ii, i, v, iv, iii**
  - d) iii, i, ii
21. Consider the following Statement: "The data set will contain an end of file character." What characteristic of SRS is being depicted here ?
- a) Consistent
  - b) **Non-verifiable**
  - c) Correct
  - d) Ambiguous
22. Consider the following Statement: "The product should have a good human interface." What characteristic of SRS is being depicted here ?
- a) Consistent
  - b) **Non-Verifiable**
  - c) Correct
  - d) Ambiguous
23. Narrative essay is one of the best types of specification document ?
- a) **True**
  - b) False
24. Which two requirements are given priority during Requirement Management of a product ?
- a) User and Developer
  - b) Functional and Non-functional
  - c) **Enduring and Volatile**
  - d) all of the mentioned
25. What are the four dimensions of Dependability ?
- a) Usability, Reliability, Security, Flexibility
  - b) Availability, Reliability, Maintainability, Security
  - c) **Availability, Reliability, Security, Safety**
  - d) Security, Safety, Testability, Usability
26. Software Engineering Principles have about three year half life.
- a) True
  - b) **False**
27. Which of the following is not one of core principles of software engineering practice?
- a) All design should be as simple as possible, but no simpler
  - b) A software system exists only to provide value to its users



- c) Pareto principle(20% of any product requires 80% of the effort)  
d) Remember that you produce others will consume
28. Which one of the following is NOT desired in a good Software Requirement Specifications (SRS) document??
- a) functional requirement  
**b) algorithm of software implementation**  
c) nonfunctional requirement  
d) goal of implementation
29. Usability can be measured in terms of
- a) Time required to become moderately efficient in system usage  
b) Net increase in productivity  
c) Intellectual skill to learn the system  
**d) All of the mentioned**
30. The process to gather the software requirements from client, analyze and document them is known as \_\_\_\_\_.
- a) Feasibility Study  
**b) Requirement Engineering**  
c) Requirement Gathering  
d) System Requirements Specification
31. The goal of requirement engineering is to develop and maintain sophisticated and descriptive \_\_\_\_\_ document.
- a) Feasibility Study  
b) Requirement Gathering  
c) Software Requirement Validation  
**d) System Requirements Specification**
32. It is the process in which developers discuss with the client and end users and know their expectations from the software.
- a) **Requirements gathering** c) Negotiation & discussion  
b) Organizing Requirements d) Documentation
33. Which of the following is correct software metrics?
- a) **Complexity Metrics** c) Process Metrics  
b) Quality Metrics d) All of the above
34. Why is Requirements Elicitation a difficult task?
- a) Problem of scope c) Problem of understanding  
b) Problem of volatility d) All of the above
35. During requirements analysis, which of the following are to be evaluated?
- a) Validation, formal methods, Accuracy.  
b) Verification, Inaccuracy, Informal methods.



c) System Context, User Populations, User Tasks.

d) None of the above

36. Whose responsibility it is to conduct interviews with the users and understand their requirements?

a) Steering committee

c) Domain Specialist

**b) Business Analyst**

d) Project Managers

37. Which one of the following is not a step of requirement engineering?

a) Requirement analysis

c) Requirement design

b) Requirement elicitation

d) Requirement documentation

38. \_\_\_\_\_ and \_\_\_\_\_ are not the subject matter of requirement analysis.

a) Performance, modelling present system

b) Functional, non-functional

c) Internal controls, present system work load

**d) Stakeholder knowledge of computers, developer's staff**

39. Initial requirements specification is \_\_\_\_\_?

**a) Only a rough indication of the requirement**

b) Not changed till the end of the project

c) Continuously changed during project implementation

d) Changed and finalized after feasibility study

40. Requirement specification is carried out \_\_\_\_\_?

a) Simultaneously with requirements determination

b) Before requirements are determined

**c) After requirements are determined**

d) Independent of requirements determination

41. Size Metrics denoted by?

a) LOC

c) GLOC

b) KLOC

d) ZLOC

42. What are the types of requirement in Quality Function Deployment(QFD)?

a) Known, Unknown, Undreamed

b) User, Developer

c) Functional, Non-Functional

d) Normal, Expected, Exciting



# 3. Software Modelling and Design

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**Position in Question Paper**

**Total Marks-14**

**Q.1. d) 2-Marks.**

**Q.2. b) 4-Marks.**

**Q.6. a) 6-Marks.**

**Q.4. c) 4-Marks.**

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## **Descriptive Question**

- 1 Compare coupling and cohesion.
- 2 Describe abstraction with its types.
- 3 Explain the need of problem partitioning.
- 4 Draw structure chart and flow chart for order processing system.
- 5 Explain the activities included in design verification.
- 6 Draw an ERD for ATM machine.
- 7 Compare white box testing and black box testing.
- 8 Write defect report a login page prompting for username and password.
- 9 Explain test summary report.



## MCQ Question

(Total number of Question=Marks\*3=14\*3=42)

Note: Correct answer is marked with **bold**

1. What Which of the following model in system modelling depicts the dynamic behaviour of the system?  
a) Behavioral Model  
**b) Context Model**  
c) Object Model  
d) Structural Model.
2. Which of the following are ares of cocerns in the design model?  
a) architecture.  
b) data  
c) interfaces  
**d) all of the above.**
3. The importance of software design can be summarized in single word  
a) accuracy  
b) simplicity  
**c) quality**  
d) efficiency
4. Which of these are characteristics of a good design  
a) exhibits strong coupling between its modules  
**b) implements all requirements in the analysis model**  
c) include test cases for all components  
d) b and d.
5. What types of abstraction are used in software design.?  
a) control  
b) data  
c) procedural  
**d) all of the above**
6. Design patterns are not applicable to the design of object-oriented software?  
a) True  
**b) False**
7. Which design models elements are used to depict a model of information represented from the users view?  
a) Architectural design elements  
b) Component level design elements  
**c) Data design elements**  
d) Interface design elements
8. .... may be used to show the principal activities and deliverables involved in carrying out some process.?  
a) Data-processing model  
b) Composition model  
c) Classification model  
**d) Process model**
9. Within a ....., data flow diagrams may be used to show how data is processed at different stages in the system.?  
a) **data-processing model**  
b) composition model  
c) classification model  
**d) process model**
- 10..... may be used to show how the system reacts to internal and external events.?



- a) Entity-relation diagram  
b) Data flow diagram  
c) Objects class diagram  
d) **State transaction diagram**
11. .... is a way of showing how data is processed by a system.  
a) **Data flow models**  
b) System models  
c) Semantic data models.  
d) Objects models
12. .... are used to show how data flows through a sequence of processing steps.  
a) **Data flow models.**  
b) System models  
c) Semantic data models.  
d) Objects models.
13. State whether the following statements about data flow model are True or False.  
i) Data flow model shows how the order for the goods moves from process to process.  
ii) Data flow diagrams are good way to describe sub-system with complex interfaces..  
a) **True, False.**  
b) False, True.  
c) False, False.  
d) True, True
14. A/An ..... in structured methods is used to describe the logical data, structured being used?  
a) data-flow model  
b) structured model  
c) classification model  
d) **entity-relation model**
15. An State whether the following statements about the advantages of using the data dictionary are True or False  
i) The data dictionary software can check for name uniqueness and tell requirements analysis of name duplication.  
ii) Data dictionary servers as store of organization information which can link analysis, design, implementation and evaluation.  
a) True, False  
b) False, True  
c) False, True  
d) **True, True**
16. What is Analysis model?  
a) Understanding of design problem.  
b) Representation of design problem solution  
c) **Representation of design problem.**  
d) All of the mentioned
17. Which of the following statement is true??  
a) A class model is representation of objects in a problem or a software solution  
b) A object model is representation of classes in a problem or a software solution  
c) All of the mentioned  
d) **None of the mentioned**
18. What are Design Class Models?  
a) **They show classes in a software system**  
b) They represents attributes, operations, association in abstraction from language

- c) They show implementation details  
d) All of the mentioned
19. Automation testing, which is also known as ? s  
a) Test Design. c) Automation Testing  
b) Test Process d) **Test Design**
20. Which testing includes testing a software manually, i.e. without using any automated tool or any script?  
a) Automation Testing c) Client Testing  
b) **Manual Testing** d) All of the above
21. Which testing comes under manual testing?  
a) unit testing c) system testing  
b) integration testing d) **All of the above**
22. In which of the following type of testing, testing is done without planning and documentation?  
a) Unit testing c) **Ad hoc testing**  
b) Retesting d) Regression testing
23. Which technique is applied for usability testing?  
a) White box c) Grey box  
b) **Black box** d) Green box
24. Which of the following is automation testing tool?  
a) Selenium c) Silk Test  
b) IBM Rational Functional Tester d) **All of the above**
25. How many levels of software testing?  
a) 1 c) 3  
b) **2** d) 4
26. Which type of testing is performed by developers before the setup is handed over to the testing team to formally execute the test cases?  
a) **Unit Testing** c) System Testing  
b) Integration Testing d) Regression Testing
27. Unit Testing cannot catch each and every bug in an application?  
a) **Yes** c) Can be yes or no  
b) No d) Can not say
28. Integration testing can be done in \_\_\_\_\_ ways?  
a) 4 c) **2**  
b) 3 d) 1
29. Which testing has the highest-level modules are tested first and progressively, lower-level modules are tested there after?  
a) **Top-down integration** c) Both a and b  
b) Bottom-up integration d) Up-down integration
30. Beta testing is also known as?



- a) post-release testing  
**b) pre-release testing**
- c) on-release testing  
d) off-release testing
31. Unit testing, integration testing and system testing when combined together is known as alpha testing
- a) **TRUE**  
b) FALSE  
c) Can be true or false  
d) Can not say
32. A software bug is an ?
- a) error  
b) fault  
c) flaw  
d) **All of the above**
33. The process of finding and fixing bugs is termed??
- a) Exception  
b) Bugs handling  
c) **Debugging**  
d) Error handling
34. Which of the following is an informal name of defect?
- a) **Bug**  
b) Defect  
c) Error  
d) Issue
35. What do you understand by V&V in software testing?
- a) **Verification and Validation**  
b) Verified Version  
c) Version Validation  
d) Version Verification
36. Which granularity level of testing checks the behavior of module cooperation?
- a) **Integration Testing**  
b) Unit Testing  
c) Acceptance Testing  
d) Regression Testing
37. Which of the following is a black box testing strategy?
- a) **Cause-Effect Graphs**  
b) All Statements Coverage  
c) Control Structure Coverage  
d) All Paths Coverage
38. White Box techniques are also classified as?
- a) Design based testing  
b) **Structural testing**  
c) Error guessing technique  
d) None of the mentioned
39. Alpha testing is done at?
- a) User's end  
b) **Developer's end**  
c) Developer's & User's end  
d) None of the mentioned
40. Maintenance testing is performed using which methodology?
- a) Retesting  
b) Sanity testing  
c) **Breadth test and depth test**  
d) Confirmation testing
41. Which of the following is not a part of a test design document?
- a) **Test Plan**  
b) Test Design Specification  
c) Test Case Specification  
d) Test Log
42. Specifying a set of test cases or test paths for each item to be tested at that level is known as





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- a) Test case generation
- b) Test case design

- c) **ALL of the mentioned**
- d) None of the mentioned



## 4. Software Project Estimation

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**Position in Question Paper**

**Total Marks-16**

**Q.1. e) 2-Marks.**

**Q.1. f) 2-Marks**

**Q.2. c) 4-Marks.**

**Q.3 b) 4-Marks.**

**Q.3 c) 6-Marks.**

**Q.4 b) 6-Marks**

**Q.6 b) 6-Marks.**

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### **Descriptive Question**

1. Explain the term measure, metric and indicator.
2. Describe Defect removal efficiency.
3. Explain functional point metric with an example.
4. Explain the parameters on which the software is measured.
5. Explain the cost estimation process.
6. Write a note on cost estimation technique.
7. list and describe the cost estimation parameters.
8. Explain COCOMO model.
9. Explain the following.
  - i. Risk management
  - ii. Risk planning
  - iii. Risk monitoring
  - iv. Risk projection
  - v. Risk refinement
10. Explain the principles of Risk management.
11. Explain the Risk identification and the involved in it.
12. Explain the different categories of risks.
13. Explain the risk management. Explain different stages involved in risk management.
14. Explain RMMM plan in detail.



## MCQ Question

(Total number of Question=Marks\*3=12\*3=36)

Note: Correct answer is marked with **bold**

- Which of the following are parameters involved in computing the total cost of a software development project?
  - Hardware and software costs.
  - Effort costs
  - Travel and training costs
  - All the above.**
- Which of the following costs is not part of the total effort cost?.
  - Costs of networking and communications.
  - Costs of providing heating and lighting office space
  - Costs of lunch time food.**
  - Costs of support staff.
- A \_\_\_\_\_ is developed using historical cost information that relates some software metric to the project cost.
  - Algorithmic cost modelling.**
  - Expert judgement
  - Estimation by analogy.
  - Parkinson's Law
- It is often difficult to estimate size at an early stage in a project when only a specification is available
  - True**
  - False
- Which model is used during early stages of the system design after the requirements have been established?
  - An application-composition model
  - A post-architecture model
  - A reuse model
  - An early design model**
- The COCOMO model takes into account different approaches to software development, reuse, etc.
  - True
  - False**
- The intent of project metrics is:
  - The intent of project metrics is:
  - for strategic purposes
  - assessing project quality on ongoing basis
  - minimization of development schedule and assessing project quality on ongoing basis**
- Which of the following is an indirect measure of product?
  - Quality
  - Complexity
  - Reliability
  - All of the Mentioned**



9. In size oriented metrics, metrics are developed based on the \_\_\_\_\_.?
- a) number of Functions  
b) number of user inputs  
c) **number of lines of code**  
d) amount of memory usage
10. A graphical technique for finding if changes and variation in metrics data are meaningful is known as.?
- a) DRE (Defect Removal Efficiency)  
b) Function points analysis  
c) **Control Chart**  
d) All of the mentioned
11. Which of the following is not project management goal?
- a) Keeping overall costs within budget  
b) Delivering the software to the customer at the agreed time  
c) Maintaining a happy and well-functioning development team  
d) **Avoiding customer complaints**
12. Project managers have to assess the risks that may affect a project.?
- a) True  
b) **False**
13. The process each manager follows during the life of a project is known as.?
- a) Project Management  
b) Manager life cycle  
c) **Project Management Life Cycle**  
d) All of the mentioned
14. A 66.6% risk is considered as?
- a) very low  
b) low  
c) **high**  
d) moderate
15. What is the output of C Program.?
- a) Received 10, Received 5,  
b) **Received 5, Received 10,**  
c) Received 0, Received 0  
d) Compiler error
16. Quality planning is the process of developing a quality plan for
- a) **project**  
b) team  
c) customer  
d) project manager
17. This activity is undertaken once the development activities start?
- a) **Project Monitoring and Control**  
b) Project Planning  
c) Project size estimation  
d) Project cost estimation
18. Which of the following activity is not the part of project planning?
- a) project estimation  
b) project scheduling.  
c) **project monitoring.**  
d) risk management
19. In the project planning, which of the following is considered as the most basic parameter based on which all other estimates are made?
- a) **project size**  
b) project effort  
c) project duration  
d) project schedule
20. During project estimation, project manager estimates following.



- a) project cost  
b) project duration
- c) project effort  
**d) all of the above**
21. Which of the following serves as metrics for project size estimation?  
**a) Lines of codes**  
b) function point  
c) Number of persons  
d) Only a and b
22. Lines of Code measures the size of project by counting?  
**a) the number of source instructions**  
b) the comments in the code  
c) the header lines  
d) All of the above.
23. "Larger code size does not necessarily mean better quality or higher efficiency."  
**a) True**  
b) False
24. We can accurately estimate lines of code from the problem specification.  
a) True  
**b) False**
25. Which of the following technique overcomes drawback related to LOC?  
a) Project Planning Sheet  
**b) Function Point Metric**  
c) COCOMO  
d) COCOMO2
26. Which of the following can estimate size of project directly from problem specification?  
a) LOC  
**b) Function Point Metric**  
c) All of the mentioned  
d) None
27. Which of the following serves as project estimation technique?  
a) Empirical estimation  
**c) Analytical estimation**  
b) Heuristic technique  
d) All of the above
28. Heuristics estimation technique depends on  
a) educated guess  
b) prior experience  
c) Common sense  
**d) All of the above**
29. Which of the following is empirical estimation technique?  
(i) expert judgement (ii) Delphi estimation (iii) COCOMO (iv) Critical path Method  
a) only i, ii & iii  
**b) only i & ii**  
c) only i, iii & iv  
d) All of the above
30. Which of the following is example of multi-variable cost estimation model?  
a) COCOMO  
**b) intermediate COCOMO**  
c) both  
d) None
31. Which of the following technique overcomes the drawbacks of expert judgement technique?  
a) Heuristic technique  
**b) Delphi cost estimation**  
c) Basis COCOMO  
d) only a & b
32. What is the full form of COCOMO?



- a) Conditional Cost Estimation Model  
b) Complete Cost Estimation Model  
**c) Construction Cost Estimation Model**  
d) Collaborative Cost Estimation Model
33. Resource allocated is done using  
a) PERT chart. c) UML.  
**b) Gantt chart.** d) pi-chart.
34. Which chart representation is suitable for project monitoring and control?  
**a) PERT chart** c) THETA chart  
b) Gantt chart d) All of the above
35. The ways in Which a software development organisation can be structured.  
a) functional formation c) both  
**b) project format** d) none
36. Which of the following are important activities of Risk Management?  
a) Risk Containment c) Risk Assessment  
b) Risk indentification **d) All of the above**
37. When we rank risks in terms of their damage causing potential, we are doing?  
a) Risk Containment c) **Risk Assessment**  
b) Risk indentification d) Risk Mapping
38. Which of the following is not strategies for containment?  
a) Risk avoiding c) Transfer risk  
**b) Risk indentification** d) Risk reduction
39. This deals with effectively tracking and controlling the configuration of a software product during its life cycle.?  
**a) Software Configuration management**  
b) Software Risk Monitoring  
c) Gantt chart  
d) COCOMO
40. Which of the following is not Risk characteristic?  
a) Inherent in every project  
b) Neither intrinsically good not bad  
**c) Something to fear but not something to manage**  
d) Probability of loss
41. Major component of Risk Analysis are?  
a) The probability that the negative event will occur  
b) The potential loss is very high



- c) The potential loss or impact associated with the event  
d) a and c
42. The \_\_\_\_\_ is not an approach to software cost estimation??  
a) Analytical  
b) Empirical  
c) Heuristic  
d) **Critical**
43. What is the process each manager follows during the life of a project is known as?  
a) Project Management  
b) Project Management Life Cycle  
c) Manager life cycle  
d) **All of the above**
44. Size and Complexity are a part of?  
a) **Product Metrics**  
b) Process Metrics  
c) Project Metrics  
d) **All of the above**
45. Cost and schedule are a part of?  
a) Product Metrics  
b) Process Metrics  
c) **Project Metrics**  
d) All of the above
46. Which of the following is not categorized under Product Operation of McCall's Software Quality Factors??  
a) **Flexibility**  
b) Reliability  
c) Usability  
d) Integrity
47. Metric is the act of obtaining a measure.  
a) True  
b) False
48. Identify the correct option with reference to Software Quality Metrics.?  
a) Integrity =  $[\text{Sigma}(1 - \text{threat})] * (1 - \text{security})$   
b) Integrity =  $[1 - \text{Sigma}(\text{threat})] * (1 - \text{security})$   
c) Integrity =  $[1 - \text{threat} * \text{Sigma}(1 - \text{security})]$   
d) **Integrity =  $\text{Sigma}[1 - \text{threat} * (1 - \text{security})]$ .**



## 5. Software Project Management and Quality Assurance

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**Position in Question Paper**

**Total Marks-14**

**Q.1. g) 2-Marks.**

**Q.2. d) 4-Marks.**

**Q.3. d) 4-Marks.**

**Q.4. c) 6-Marks**

**Q.4. d) 6-Marks**

**Q.6. c) 6-Marks**

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### **Descriptive Question**

1. Explain the project scheduling process.
2. List the basic principles of project scheduling.
3. Explain the relationship between people and efforts in project scheduling.
4. Explain the need of gantt chart and explain it with an example.
5. Explain the need of PERT/CPM chart.
6. Compare PERT and CPM.
7. Explain WBS.
8. Explain importance of quality control and quality assurance important.
9. Explain the various causes behind the errors in a software product .
10. Explain the difference between software assurance and .
11. Explain McCalls quality factors.
12. Explain six sigma in detail .
13. Explain three formal approaches to SQA .
14. Explain ISO quality standards .
15. Explain the CMMI framework in detail.





## MCQ Question

(Total number of Question=Marks\*3=14\*3=42)

Note: Correct answer is marked with **bold**

- Which of the following is not included in failure costs?
  - rework
  - repair.
  - failure mode analysis
  - None of these**
- Which requirements are the foundation from which quality is measured?
  - Hardware
  - Software**
  - Programmers
  - None of the mentioned
- Which of the following is not a SQA plan for a project?
  - evaluations to be performed
  - amount of technical work**
  - audits and reviews to be performed
  - documents to be produced by the SQA group
- Degree to which design specifications are followed in manufacturing the product is called
  - Quality Control
  - Quality of conformance**
  - Quality Assurance
  - None of the mentioned
- Which of the following is not included in External failure costs?
  - testing**
  - help line support
  - warranty work
  - complaint resolution
- Which of the following is not an appraisal cost in SQA?
  - inter-process inspection
  - maintenance
  - quality planning**
  - testing
- Who identifies, documents, and verifies that corrections have been made to the software?
  - Project manager
  - Project team
  - SQA group**
  - All of the mentioned
- What is not included in prevention costs?
  - quality planning
  - formal technical reviews
  - test equipment
  - equipment calibration and maintenance**
- Software quality assurance consists of the auditing and reporting functions of management.
  - True**
  - False
- What kind of quality cost is incurred when an error is detected in a product prior to shipment?



- a) Prevention  
**b) Internal Failure**  
c) External Failure  
d) Appraisal.
11. Which quality is measured as a foundation of requirement...?  
a) Hardware  
b) Programmers  
**c) Software**  
d) none of the mentioned
12. Select which option is not true about SQA...?  
a) Audits and reviews to be performed by the team  
b) Amount of technical work to be performed  
**c) Evaluations to be performed**  
d) Documents that are produced by the SQA team.
13. Software quality assurance consists of which function of management.  
a) reporting functions  
b) auditing functions  
**c) both a and b**  
d) All of the above
14. Which of the following is not included in prevention cost  
**a) equipment calibration and maintenance**  
b) formal technical reviews  
c) test equipment reviews  
d) quality planning review
15. Select the people who identify the document and verifies the correctness of the software  
a) Project manager  
**b) SQA team**  
c) Project team  
d) All of the mentioned
16. Select the option which is not an appraisal in SQA?  
a) inter-process inspection.  
**b) maintenance**  
c) testing  
d) quality planning
17. Which of the following is the reason that software is delivered late?  
a) Changing customer requirements that are not reflected in schedule changes  
b) Technical difficulties that could not have been foreseen in advance  
c) Human difficulties that could not have been foreseen in advance  
**d) All of the mentioned**
18. Every task that is scheduled should be assigned to a specific team member is termed as?  
a) Compartmentalization  
b) Defined milestones  
**c) Defined responsibilities**  
d) Defined outcomes
19. What is a collection of software engineering work tasks, milestones, and deliverables that must be accomplished to complete a particular project?  
**a) Task set**  
b) Degree of milestone  
c) Adaptation criteria  
d) All of the mentioned



20. Ensuring that no more than the allocated number of people are allocated at any given time in Software Scheduling is known as
- a) Time Allocation
  - b) Effort Validation**
  - c) Defined Milestone
  - d) Effort Distribution
21. What evaluates the risk associated with the technology to be implemented as part of project scope?
- a) Concept scoping
  - b) Preliminary concept planning**
  - c) Technology risk assessment
  - d) Customer reaction to the concept
22. Which of the following is not an adaptation criteria for software projects?
- a) Size of the project
  - b) Customers Complaints**
  - c) Project staff
  - d) Mission criticality
23. Which of the following is a project scheduling method that can be applied to software development?
- a) PERT
  - b) CPM
  - c) CMM
  - d) Both PERT and CPM**
24. A project usually has a timeline chart which was developed by?
- a) Henry Gantt**
  - b) Barry Boehm
  - c) Ivar Jacobson
  - d) None of the mentioned
25. Which of the following is responsible for the quality objective?
- a) Top level management
  - b) Middle level management**
  - c) Frontline management
  - d) All of the above
26. Which of the following is not a core step of Six Sigma?
- a) Define
  - b) Control**
  - c) Measure
  - d) Analyse
27. The first step in project planning is?
- a) determine the budget**
  - b) select a team organizational model
  - c) determine the project constraints
  - d) establish the objective and scope
28. Process framework activities are populated with?
- a) milestones**
  - b) workproduct
  - c) QA points
  - d) all of the above
29. Which of the following is not one of the guiding principles of software project scheduling
- a) compartmentalization
  - b) market assesment**
  - c) time allocation
  - d) effort validation
30. The software equation can be used to show that by extending the project deadline slightly



- a) fewer people are required
- b) you are guaranteed to meet the deadline
- c) more lines of code can be produced
- d) none of the above**

31. A task set is a collection of

- a) engineering work task, milestones, deliverables
- b) task assignments, cost estimates, metrics
- c) milestones, deliverables, metrics
- d) responsibilities, milestones, documents

32. The task (activity) network is a useful mechanism for

- a) computing the overall effort estimate
- b) detecting intertask dependencies
- c) determining the critical path
- d) b and c**

33. Two tools for computing critical path and project completion times from activity networks

- a) CPM
- b) PERT
- c) FP
- d) a and b**

34. Which one of the following is not a fundamental activity for software processes in software engineering?

- a) Software Verification
- b) Software Validation
- c) Software design and implementation
- d) Software evolution

35. Quality Management in software engineering is also known as

- a) SQA
- b) SQM
- c) SQI
- d) SQA and SQM

36. Quality also can be looked at in terms of user satisfaction which includes

- a) A compliant product
- b) Good quality output
- c) Delivery within budget and schedule
- d) All of the mentioned

37. Inspections and testing are what kinds of Quality Costs?

- a) Prevention
- b) Internal Failure
- c) External Failure
- d) Appraisal

38. According to Pareto's principle, x% of defects can be traced to y% of all causes.

What are the values of x and y?

- a) 60,40
- b) 70,30
- c) 80,20
- d) no such principle exists

39. What is Six Sigma?

- a) It is the most widely used strategy for statistical quality assurance



- b) The “Six Sigma” refers to six standard deviations  
c) It is the most widely used strategy for statistical quality assurance AND The “Six Sigma” refers to six standard deviations  
d) A Formal Technical Review(FTR) guideline for quality walkthrough or inspection
40. Which of the following is not a core step of Six Sigma?  
a) Define  
b) Control  
c) Measure  
d) Analyse
41. Software safety is equivalent to software reliability.  
a) True  
b) **False**
42. According to ISO 9001, inspection and testing comes under which management responsibility?  
a) Process control  
b) Document control  
c) Control of nonconforming products  
d) Servicing