

Instructions: Answer **a total of 41** questions, 40 from Group A through Group F, and 1 from GROUP-G, choosing **at least a minimum number from each group as specified below:**

Group	Minimum number of questions to be answered from group	Total number of questions to be answered
A	4	40
B	5	
C	5	
D	4	
E	10	
F	5	
G	1 (no choice)	01

GROUPs A-F $40 \times 2 = 80$

Choose the unique correct answer.

GROUP-A

Answer at least 4 questions

- The RAD model can be used
 - On systems with reasonably well-known requirements
 - When requirements are not known up-front
- For project that require a medium to high risk, an appropriate process model is
 - RAD
 - Spiral
 - Prototype
 - none of the above
- If the requirements indicate a complex system, an appropriate process model is
 - Prototype
 - RAD
 - Waterfall
 - none of the above

[Turn over

4. If resources (time, money, tools, people) are scarce, the appropriate process model is
- (a) Prototype
 - (b) RAD
 - (c) Waterfall
 - (d) none of the above
5. If the customer wants to track project progress, an appropriate process model is
- (a) RAD
 - (b) Spiral
 - (c) Waterfall
 - (d) none of the above
6. If the Project team is more comfortable with structure than flexibility, an appropriate process model is
- (a) Prototype
 - (b) RAD
 - (c) Spiral
 - (d) Waterfall

GROUP-B

Answer at least 5 questions

7. In Function-Oriented Software Design the system state is
- (a) centralised and shared among different functions
 - (b) decentralised among the modules
8. A data-flow diagram (DFD)
- (a) shows the sequence of execution of different functions
 - (b) shows the data interchange among the different functions
9. When a given model object is accessed by a large number of view objects, and the model state changes asynchronously, the interaction is best structured as a
- (a) Model-View-Controller (MVC) Pattern
 - (b) Publish-Subscribe Pattern
 - (c) Observer Pattern
 - (d) Expert Pattern
10. Swim lines are used to represent parallel activities in a
- (a) Collaboration Diagram
 - (b) Sequence Diagram
 - (c) Activity Diagram
 - (d) State Chart

11. When modules that access or manipulate certain data are kept together (e.g. in the same class) - and everything else is kept out, one achieves

- (a) Functional Cohesion
- (b) Communicational Cohesion
- (c) Layer Cohesion
- (d) Temporal Cohesion

12. It is hard to understand and change a system when a set of modules is

- (a) tightly coupled
- (b) loosely coupled

13. Domain layer objects provide required service while presentation layer objects handle interactions with the user in the

- (a) Observer Pattern
- (b) Expert Pattern
- (c) Façade Pattern
- (d) Model View Separation Pattern

GROUP-C

Answer at least 5 questions

14. A program calculates the intersection point of two straight lines and displays the result. It reads two integer pairs (m1, c1) and (m2,c2) defining two straight lines of the form

$$y = mx + c.$$

Equivalence Class Testing is carried out to test the program.

The number of Equivalence classes is

- (a) 1
- (b) 2
- (c) 3
- (d) 4

For Q15-16: Consider the following module hierarchy:

Top-level—M0

M0 calls M1 and M2

M1 calls M3 and M4

M2 calls M5 and M6

15. In the top-down approach, the integration of M0-M1-M3-M4 process occurs after (not necessarily immediately after) the integration of

- (a) M2-M6
- (b) M2-M5
- (c) M1-M4
- (d) M0-M2-M5-M6

16. In the bottom-up approach, the integration of M1-M0 occurs after the integration of
- (a) M5-M2
 - (b) M4-M1
 - (c) M6-M2
 - (d) M5-M2-M6-M0
17. A test which ensures that every branch alternative is exercised at least once is called
- (a) Branch coverage
 - (b) Condition coverage
 - (c) Statement coverage
 - (d) Multiple condition coverage
18. The test method in which one variable is held at its extreme value and other variables are held at their nominal values in the input domain is called
- (a) Robustness Testing
 - (b) Boundary Value Testing
 - (c) Worst Case Testing
 - (d) none of the above
19. Complex combinations of input conditions are considered in
- (a) Boundary value analysis
 - (b) Equivalence class partitioning
 - (c) Decision Table-based testing
 - (d) none of the above
20. Stubs are used in
- (a) Bottom-Up Integration
 - (b) Top-Down Integration

GROUP-D

Answer at least 4 questions

With reference to an SRS, answer the following:

21. Efficiency is a subsection of

- (a) Functional Requirements
- (b) External Interface Requirements
- (c) Performance Requirements
- (d) Quality Characteristics

22. The outputs of each function are listed under

- (a) Functional Requirements
- (b) External Interface Requirements
- (c) Design Constraints
- (d) none of the above

23. Product Functions are summarized in the following subsection:

- (a) Introduction
- (b) General Description
- (c) Specific Requirements
- (d) Supporting Information

24. If an SRS includes the definition of the responses of the software to all realizable classes of input data in all realizable classes of situations, it is

- (a) Correct
- (b) Unambiguous
- (c) Complete
- (d) Consistent

25. If an SRS has a temporal conflict between two specified actions (e.g. one requirement states that "A" must always follow "B", while another requires that "A" and "B" occur simultaneously), then it is

- (a) incorrect
- (b) ambiguous
- (c) incomplete
- (d) inconsistent

GROUP-E

Answer at least 10 questions

26. The following is NOT an advantage of Function Point Analysis:

- (a) it can be applied early in the software development life cycle
- (b) it is best performed after the creation of a design specification
- (c) environmental factors are considered
- (d) it is independent of programming language, technology, and techniques, except for the adjustment at the end.

27. The maximum impact of environmental factors on the raw function point total is

- (a) 20%
- (b) 25%
- (c) 35%
- (d) NIL

28. In Function Point Analysis

- (a) Queries use simple keys
- (b) Queries use many keys
- (c) Inquiries perform update functions
- (d) Inquiries are same as queries

29. Cost drivers are NOT used in

- (a) Basic COCOMO
- (b) Intermediate COCOMO
- (c) Detailed COCOMO
- (d) all of the above

30. A three-level product hierarchy is used in

- (a) Basic COCOMO
- (b) Intermediate COCOMO
- (c) Detailed COCOMO
- (d) all of the above

31. An air-traffic control system is best modelled by the following COCOMO mode:

- (a) Organic
- (b) Semidetached
- (c) Embedded
- (d) none of the above

32. Schedule Variance (SV) is defined as

- (a) $SV = BCWP - BCWS$
- (b) $SV = BCWS - BCWP$
- (c) $SV = ACWP - BCWP$
- (d) none of the above

33. Cost Variance (CV) is defined as

- (a) $CV = BCWP - BCWS$
- (b) $CV = BCWP - ACWP$
- (c) $CV = ACWP - BCWS$
- (d) none of the above

34. Earned Value (EV) is defined as

- (a) $EV = BCWP/ACWP$
- (b) $EV = BCW / BAC$
- (c) $EV = BCWP / BAC$
- (d) none of the above

[N.B. BAC $\equiv$ Budget at Completion]

35. Risk factors, evidence, and rank (Low/Medium/High) are listed in

- (a) Weekly Risk Change Report
- (b) Risk Response Table
- (c) Risk Categorization Table
- (d) all of the above

36. Risk Exposure is computed for

- (a) the top 10 risks
- (b) all risks rated HIGH
- (c) both (a) and (b)
- (d) all identified risks

37. The category of potential risk that usually gets the most attention from Project Managers is

- (a) Development environment
- (b) Schedule
- (c) Performance
- (d) Budget/Cost

38. Risks that are known to the project team as a category of risk, but not known as a reality on the specific project being executed are called

- (a) Known unknowns
- (b) Known knowns
- (c) Unknown unknowns
- (d) Unknown knowns

GROUP-F

Answer at least 5 questions

39. The cyclomatic complexity of a method may be use to determine
(a) WMC
(b) DIT
(c) NOC
(d) CBO
40. The number of methods in the set of all methods that can be invoked in response to a message sent to an object of a class is referred to as
(a) LCOM
(b) CBO
(c) RFC
(d) DIT
41. Level-4 ("Managed") of Process Maturity in the SW-CMM focuses on
(a) Continuous Process Improvement
(b) Product and Process Quality
(c) Engineering Processes and Organizational Support
(d) Project Management Processes
42. Level-2 ("Repeatable") of process maturity in the SW-CMM focuses on
(a) Project Management Processes
(b) Continuous Process Improvement
(c) Engineering Processes and Organizational Support
(d) Product and Process Quality
43. The OO-metric which refers to how closely the operations in a class are related to one another is
(a) Encapsulation
(b) Cohesion
(c) Coupling
(d) Complexity
44. The metric
- $$\frac{\text{Number of defects}}{\text{Size in LOC or FP}}$$
- is called
(a) Usability
(b) Functionality
(c) Defect density
(d) Portability

45. "If you can measure the defects in a process, you can systematically figure out ways to eliminate them and approach a quality level of zero defects." This is the philosophy of

- (a) Six Sigma
- (b) Inspection
- (c) Walkthrough
- (d) Reviews

GROUP-G

20

46. The following table lists the jobs of a network along with their time estimates. Activities are identified by their beginning (i) and ending (j) node numbers.

Job		Duration (days)		
i	j	Optimistic	Most Likely	Pessimistic
1	2	3	6	15
1	6	2	5	14
2	3	6	12	30
2	4	2	5	8
3	5	5	11	17
4	5	3	6	15
6	7	3	9	27
5	8	1	4	7
7	8	4	19	28

- (a) Draw the project network.
- (b) Calculate the length and variance of the critical path.
- (c) What is the approximate probability that jobs in the critical path will be completed by the due date of 41 days ?
- (d) What is the approximate probability that jobs on the next most critical path will be completed by the due date ?
- (e) What is your estimate of the probability that the entire project will be completed by the due date? Explain.

Following is an extract from the **STANDARD NORMAL TABLE**:

Z	Probability of meeting Due Date
3.0	0.999
2.8	0.997
2.6	0.995
2.4	0.992
2.2	0.986
2.0	0.977
1.8	0.964
1.6	0.945

1.4	0.919
1.2	0.885
1.0	0.841
0.8	0.788
0.6	0.726
0.4	0.655
0.2	0.579
0.0	0.500
-0.2	0.421
-0.4	0.345
-0.6	0.274
-0.8	0.212
-1.0	0.159
-1.2	0.115
-1.4	0.081
-1.6	0.055
-1.8	0.036
-2.0	0.023
-2.2	0.014
-2.4	0.008
-2.6	0.005
-2.8	0.003
-3.0	0.001

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