CS-701

SOFTWARE ENGINEERING

Time Allotted: 3 Hours   Full Marks: 70

The questions are of equal value.
The figures in the margin indicate full marks
Candidates are required to give their answers in their own words as far as practicable.

GROUP A
(Multiple Choice Type Questions)

1. Answer all questions. $10 \times 1 = 10$

(i) In Integration Testing approach, where all modules making up a system are integrated in a single step is known as -----

(A) top-down Integration Testing
(B) bottom-up Integration Testing
(C) big-band Integration Testing
(D) mixed Integration Testing

(ii) MTTF is a measure of ---

(A) reliability   (B) maintainability
(C) cost of effort   (D) testability

(iii) To allocate resource to activities we use

(A) PERT chart   (B) Gnatt chart
(C) Network diagram   (D) all of these

(iv) To achieve a good design, modules should have-

(A) weak cohesion low coupling
(b) weak cohesion high coupling
(c) strong cohesion low coupling
(D) strong cohesion high coupling

(v) Which is NOT a non-functional requirement?

(A) efficiency   (B) reliability
(C) product features   (D) stability

(vi) If data from one module is used to direct the order of execution in another, then the coupling is known as-

(A) Stamp Coupling   (B) Data Coupling
(C) Control Coupling   (D) Content Coupling

(vii) Cardinality in an ER Diagram refers to

(A) number of attributes in an entity
(B) the order of co-related entities
(C) the number of sub-entities
(D) degree of a relationship

(viii) Alpha-testing is done by

(A) the development team   (B) a friendly set of customers
(C) the customer himself   (D) none of these

(ix) Which model is generally used for developing GUI of a system?

(A) spiral   (B) prototyping
(C) iterative waterfall   (D) evolutionary

(x) Data hiding can be achieved by

(A) Data Encapsulation   (B) Data Overloading
(C) Data Abstraction   (D) Polymorphism

GROUP B
(Short Answer Type Questions)

Answer any *three* questions. 3×5

2. What is Mutation Testing? Distinguish between White-box Testing and Black-box Testing?

7001   1

7001   2

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3. Draw an ER Diagram for Hospital Management System showing cardinalities, strong and weak entities, derived attributes, primary key etc.

4. Distinguish between software verification and software validation. When during the life cycle verification and validation performed?   3+2

5. (a) What are 'baselines' with respect to software configuration management?   3+2
   (b) What is the necessity of software configuration management in developing a software?

6. A project was estimated to be 200 KLOC. Calculate the effort development time, average staff size and productivity level for   5
        i) Organic
        ii) Semi-detached modes.

GROUP C
(Long Answer Type Questions)

Answer any *three* questions.   3×15 = 45

7. (a) Explain "Use Case" diagram. What are the essential criteria for ideal use case diagram? What are the "extends" and "includes" constructs in use case diagram? Draw a use case diagram for Nursing Home functionality where examples of actors are Patient, Doctor, Reception Staff, Billing Staff and Administrator etc.   1+2+2+5
   (b) Explain Sequence and Activity diagram with example.   5

8. (a) Explain when and why you will use PERT charts and when and why you will use Gantt charts while you are a project manager.   4
   (b) Consider a software project with 5 activities T1 to T5. Duration of 5 activities in weeks are 3,2,3,5,2 respectively. T2 and T4 can start when T1 is complete. T3 can start when T2 is complete. T5 can start when both T3 and T4 are complete. Draw activity network for the project. When is the latest start date of the activity T3? What is the float of the activity T4? Which activities are on the critical path? Draw the Gantt chart also.   3+1+1+3+3

9. (a) Draw the context diagram and Level-1 DFD for Library management system. Draw also USE-CASE diagram for this system
   (b) What do you mean by balancing of DVD? Explain with a suitable example.
   (c) Explain the LOC, Function point and Feature point.

10. (a) What is SRS? Write the features of SRS.
    (b) What is Risk? Why Risk Analysis is done?
    (c) What is "Top-Down and Bottom-Up Design" approach?

11. Write short notes on any *three* of the following:
    (a) Software Configuration Management
    (b) Six Sigma
    (c) Decision Tree and Decision Table
    (d) ISO vs. CMM standards.
    (e) Software quality metrics.