



ENGINEERING & MANAGEMENT EXAMINATIONS, JUNE - 2009
ANALYSIS & DESIGN OF INFORMATION SYSTEM
SEMESTER - 4

Time : 3 Hours]

[Full Marks : 70

GROUP - A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for the following : 10 × 1 = 10
- i) Level-0 DFD is similar to
- | | |
|--------------------|---------------------|
| a) system diagram | b) use-case diagram |
| c) context diagram | d) none of these. |
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- ii) Alpha and beta testing techniques are related to
- | | |
|-----------------------|-------------------------|
| a) system testing | b) unit testing |
| c) acceptance testing | d) integration testing. |
-
- iii) Software mistakes during coding are known as
- | | |
|-------------|------------|
| a) failures | b) defects |
| c) bugs | d) errors. |
-
- iv) If n is the numbers of programmers in a project team, then number of communication paths is
- | | |
|---------------|-----------------|
| a) $n(n-1)/2$ | b) $n(n+1)/2$ |
| c) n | d) $n \log n$. |
-
- v) The relationship of data elements in a module is called
- | | |
|---------------|-------------------|
| a) coupling | b) cohesion |
| c) modularity | d) none of these. |
-



- vi) A major principle of modularization is
- a) the cohesion of modules is low and coupling between modules is high
 - b) the cohesion of modules is high and coupling between modules is low
 - c) minimize the number of modules
 - d) maximize the number of modules.
- vii) Normalisation is used to
- a) mathematically optimize the process
 - b) increase the data integrity
 - c) remove the data redundancy
 - d) both (a) and (b).
- viii) When all the columns (attributes) in relation describe and depend upon the primary key, the relation is said to be in
- a) 1 NF
 - b) 2 NF
 - c) 3 NF
 - d) 4 NF.
- ix) Which one is Data Model ?
- a) Embedded
 - b) Network
 - c) Semi-detached
 - d) basic COCOMO.
- x) Which phase needs maximum effort ?
- a) Requirement analysis and design
 - b) Design
 - c) Testing
 - d) Maintenance.

**GROUP - B****(Short Answer Type Questions)**

Answer any three of the following.

 $3 \times 5 = 15$

2. a) Distinguish between Black Box testing and White Box testing.
- b) What is integration testing ? 3 + 2
3. Why would you choose a database system instead of simply storing data in files ?
4. What is prototype ? Draw a schematic diagram of prototyping model of software development.
5. What is meant by the term 'Cohesion and Coupling' in the context of software design ?
What problem is likely to occur if a module has low cohesion ?
6. What are the main differences between Physical and Logical DFD ?

GROUP - C**(Long Answer Type Questions)**

Answer any three of the following.

 $3 \times 15 = 45$

7. a) What are transformation analysis and transaction analysis ?
- b) Draw the level-0, level-1 and level-2 DFD of the following :

An RMS (Root Mean Square) calculating software reads three integer numbers from user and determines the root-mean square of those three input numbers and then displays it.
- c) Write down the steps to convert the DFD of Question [7 (b)] to the structure chart using transformation analysis method. 3 + 6 + 6
8. a) Define strong entity and weak entity with an example.
- b) What is aggregation ? Discuss with an example.



- c) What do you mean by *E-R* diagram. What are the steps to draw an *E-R* diagram ?
- d) Draw the *E-R* diagram of the following :

Consider a university database for the scheduling of classrooms for final exam. This database could be moduled as single entity set 'exam' with attributes course name, section_number, room_number and time. Alternatively, one or more additional entity set could be defined, along with relationship set to replace some of the attributes of the 'exam' entity set as

- i) Course with attributes name, department and c-number
- ii) Section with attributes s-number, enrolment and dependent as a weak entity set on course.
- iii) Room with attributes r-number, capacity and building. 2 + 2 + 4 + 7

9. a) What is feasibility study ? Explain in detail.
- b) Explain spiral model.
- c) "Incremental model is a combination of waterfall model and prototype model." Justify your answer. 5 + 5 + 5

10. a) What do you mean by verification and validation ?
- b) What is requirement analysis ? Explain in detail.
- c) Discuss bottom-up and top-down testing of computer program.
- d) What is McCabe's cyclomatic complexity ? 3 + 5 + 5 + 2



11. Draw a decision table for the following problem :

The discount policy has following conditions for the customers :

If customer is 'book stores' : Get a trade discount of 25%, if orders for 6 or more copies per book title. If customer is 'libraries and individuals' : 5% allowed on order of 6-19 copies per book title 10% on orders for 20-49 copies per book title and 15% on orders for 50 copies or more per book title.

Develop a process description in decision table and decision tree. What are the advantages and disadvantages of decision tree ?

10 + 5

12. Write short notes on any *three* of the following :

3 × 5

- a) Structure chart
- b) Data dictionary
- c) White-box testing
- d) SRS document
- e) PERT chart
- f) Decision tree.

END