CS / B.Tech(IT) / SEM-4 / IT-401 / 09

1. ....
Signature of Invigilator

2. .... **Reg. No.** | | | | | | | | | | | | | | | |
Signature of the Officer-in-Charge

Roll No. of the Candidate | | | | | | | | | | | | | | | |

CS / B.Tech(IT) / SEM-4 / IT-401 / 09

ENGINEERING & MANAGEMENT EXAMINATIONS, JUNE – 2009

ANALYSIS & DESIGN OF INFORMATION SYSTEM (SEMESTER - 4)

Time : 3 Hours] [Full Marks : 70

INSTRUCTIONS TO THE CANDIDATES :

1. This Booklet is a Question-cum-Answer Booklet. The Booklet consists of **32 pages**. The questions of this concerned subject commence from Page No. 3.
2. a) In **Group – A**, Questions are of Multiple Choice type. You have to write the correct choice in the box provided **against each question**.
   b) For **Groups – B** & **C** you have to answer the questions in the space provided marked 'Answer Sheet'. Questions of **Group – B** are Short answer type. Questions of **Group – C** are Long answer type. Write on both sides of the paper.
3. **Fill in your Roll No. in the box** provided as in your Admit Card before answering the questions.
4. Read the instructions given inside carefully before answering.
5. You should not forget to write the corresponding question numbers while answering.
6. Do not write your name or put any special mark in the booklet that may disclose your identity, which will render you liable to disqualification. Any candidate found copying will be subject to Disciplinary Action under the relevant rules.
7. **Use of Mobile Phone and Programmable Calculator is totally prohibited in the examination hall.**
8. You should return the booklet to the invigilator at the end of the examination and should not take any page of this booklet with you outside the examination hall, **which will lead to disqualification**.
9. Rough work, if necessary is to be done in this booklet only and cross it through.

No additional sheets are to be used and no loose paper will be provided

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FOR OFFICE USE / EVALUATION ONLY

Marks Obtained

Group – A **Group – B** **Group – C**

Question Number																***Total Marks***	***Examiner's Signature***
Marks Obtained																	

....

Head-Examiner / Co-Ordinator / Scrutineer

4402 (04/06)

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GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for the following : $10 \times 1 = 10$

i) Level-0 DFD is similar to

a) system diagram b) use-case diagram

c) context diagram d) none of these. ☐

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 ∞ 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 ∞ 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 Macabe'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