

**INFORMATION SYSTEM ANALYSIS AND DESIGN
(MCAP 1205)**

Time Allotted : 3 hrs

Full Marks : 70

Figures out of the right margin indicate full marks.

*Candidates are required to answer Group A and
any 5 (five) from Group B to E, taking at least one from each group.*

Candidates are required to give answer in their own words as far as practicable.

**Group – A
(Multiple Choice Type Questions)**

1. Choose the correct alternative for the following: **10 × 1 = 10**
- (i) Which of the following statements is true?
 - (a) A parallel run involves two different terminals accessing a common database
 - (b) Computers are essential for systems analysis
 - (c) Flow of information in an organization is always vertical
 - (d) A system flowchart is not a part of a program documentation package.
 - (ii) Which of the following is not a type of system requirement?
 - (a) Functional (b) Non-functional (c) User (d) Technical.
 - (iii) In _____ system the interaction between various subsystems cannot be defined with certainty.
 - (a) Open (b) Closed (c) Deterministic (d) Probabilistic
 - (iv) PERT means
 - (a) Project Estimation and Review Technique
 - (b) People Evaluation and Review Technique
 - (c) Program Evaluation and Review Technique
 - (d) Product Evaluation and Review Technique.
 - (v) After the design phase the document prepared is known as _____
 - (a) system specification (b) performance specification
 - (c) design specification (d) None of these.
 - (vi) An ER diagram can express the overall _____ of a database graphically.
 - (a) view structure (b) logical structure.
 - (c) model structure (d) architectural Structure.
 - (vii) Decision tree uses
 - (a) pictorial depiction of alternate conditions
 - (b) nodes and branches
 - (c) consequences of various depicted alternates
 - (d) all of these.

- (viii) Which of the following components are represented in data flow perspective?
- (a) Inputs and Outputs
 - (b) Inputs, Outputs and dependencies
 - (c) Data transformation activities
 - (d) Roles/activities of the people involved in the software process.
- (ix) Cost-Benefit analysis
- (a) compares the cost with the benefits of introducing a computer based system
 - (b) estimates the hardware and software costs
 - (c) evaluates the tangible and non-tangible factors
 - (d) all of these.
- (x) The Relations bring from an E-R model will usually be in
- (a) third normal form
 - (b) second normal form
 - (c) first normal form
 - (d) fourth normal form.

Group - B

2. (a) Explain the different type of information with example. *[[CO1](Understand/LOCQ)]*
(b) "Documentation is important to the information system life cycle" – Justify with relevant example. *[[CO1](Evaluate/HOCQ)]*
5 + 7 = 12
3. (a) Compare and contrast the different methodologies of the following methodologies with each other.
(i) Crystal Methodology
(ii) FDD Methodology
(iii) DSDM Methodology
(iv) Lean software development Methodology. *[[CO1](Understand/LOCQ)]*
(b) Analyse the Spiral Model of software development with strength, weakness and give the reasons for using Spiral Model. *[[CO2](Analyse/IOCQ)]*
6 + 6 = 12

Group - C

4. (a) Discriminate physical DFD and Logical DFD with relevant example. *[[CO4](Analyze/IOCQ)]*
(b) If the sales and profit for the two years are given below.
- | Year | Sales | Profit |
|------------|----------|---------|
| 31/03/2021 | ₹150,000 | ₹20,000 |
| 31/03/2022 | ₹170,000 | ₹25,000 |
- (i) Calculate PV (Profit-Volume) ratio.
(ii) BEP (Break Even Point).
(iii) The sales required to earn a profit of ₹ 40,000.
(iv) Margin of safety at a profit of ₹ 50,000.
(v) The profit made when sales are ₹ 250,000. *[[CO3](Evaluate/HOCQ)]*
2 + 10 = 12

5. (a) Describe the desirable characteristics of a SRS. What are the functional and non-functional requirements of a good SRS-explain with an example.
 [(CO3) (Analyze/IOCQ)]
- (b) The Absolute Beginners Inc. is planning to launch a revolutionary social networking site. You have been entrusted with designing a DFD for the proposed application. In particular, you have been asked to show the following scenarios:
- User registration
 - User login
 - Profile update
- Generate a Context diagram and Level-1 DFD to depict the above data flow and the corresponding processes.
 [(CO4) (Create/HOCQ)]

4 + 8 = 12

Group – D

6. (a) Applying ID3 Algorithm construct the decision tree for the following data set.

Age	Competition	Type	Class(Profit)
Old	Yes	Software	Down
Old	No	Software	Down
Old	No	Hardware	Down
Mid	Yes	Software	Down
Mid	Yes	Hardware	Down
Mid	No	Hardware	Up
Mid	No	Software	Up
New	Yes	Software	Up
New	No	Hardware	Up
New	No	Software	Up

[(CO4)(Construct/HOCQ)]

- (b) Differentiate between Specialization and Generalization with example.

[(CO2)(Analyze/IOCQ)]

8 + 4 = 12.

7. (a) On the basis of the following information implement an ER diagram.
- Persons in the organization are identified by PERSON-ID and have a SUR-NAME, FIRST-NAME and DATE-OF-BIRTH.
 - The persons are responsible for orders, which are identified by an ORDER-NO and have an ORDER-DATE, DESCRIPTION and QUOTED-PRICE. Each order is from one customer. Only one person is responsible for a given order but a person may be responsible for many orders.
 - The organization manufactures the orders in a series of jobs. The person responsible for an order makes formal requests to sections to carry out these jobs. The requests are identified by a REQUEST-NO. They nominate a START-DATE and END-DATE for each request.

- (iv) A number of jobs can be created by a section in response to a request. Each job is identified by a JOB-NO and has a COST. All jobs for one request go to some section, which is identified by SECTION-ID and has one MANAGER.
 - (v) Each job uses a QTY-USED of one or more materials. Materials are identified by MAT-ID and have a MAT-DESCRIPTION. [[CO4](Apply/IOCQ)]
 - (b) Analyse the following terms with relevant example/diagram.
 - (i) Structured Chart.
 - (ii) Module coupling. [[CO6](Analyze/IOCQ)]
- 8 + 4 = 12**

Group - E

- 8. (a) Analyse Output Format types: Tabular format, Graphical format, Detailed Reports and Summary Reports with proper diagram and format. [[CO6](Analyze/IOCQ)]
 - (b) Differentiate the terms verification and validation? Explain various input verification and validation methods with examples. [[CO3](Analyze/IOCQ)]
- 6 + 6 = 12**
- 9. (a) Illustrate audit trail with an examples. [[CO4](Remember/LOCQ)]
 - (b) "System analyst includes audit controls in a system" - Justify the statement. [[CO4](Evaluate/HOCQ)]
 - (c) Explain the importance of training for users before implementation. [[CO4](Understand/LOCQ)]
- 4 + 4 + 4 = 12**
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<i>Cognition Level</i>	<i>LOCQ</i>	<i>IOCQ</i>	<i>HOCQ</i>
<i>Percentage distribution</i>	<i>19.80</i>	<i>41.66</i>	<i>38.54</i>

Course Outcome (CO):

After the completion of the course students will be able to

MCAP1205.1 Understand the idea of information system in lieu of the modern abstraction of data

MCAP1205.2 Analyze various phases of system development life cycle.

MCAP1205.3 Gather data to analyze and specify the requirements of a system.

MCAP1205.4 Design system components and environments.

MCAP1205.5 Analyze the feasibility of a project.

MCAP1205.6 Deliver various types of system documentation.

**LOCQ: Lower Order Cognitive Question; IOCQ: Intermediate Order Cognitive Question; HOCQ: Higher Order Cognitive Question.*