

2010

Time : 3 hours

Full Marks : 80

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

The figures in the margin indicate full marks.

Answer from both the Groups as directed.

Group – A

(Objective Type Questions)

Answer all questions.

1. Choose the correct answer of the following :

2×10 = 20

(a) Relational Algebra is :

- (i) Data Definition Language
- (ii) Meta Language
- (iii) Procedural query language
- (iv) Non procedural language

- (b) 4NF is designed to cope with :
- (i) Transitive dependency
 - (ii) Join dependency
 - (iii) Multi valued dependency
 - (iv) None of the above
- (c) A schema describes :
- (i) Record Relationship
 - (ii) Data Elements
 - (iii) Record and files
 - (iv) All of the above
- (d) Which one of the following is not a valid unary operation in the relational algebra ?
- (i) Select
 - (ii) Min
 - (iii) Project
 - (iv) Rename
- (e) Which one is lowest level data model ?
- (i) Physical data model
 - (ii) Logical data model
 - (iii) External data model
 - (iv) None of the above

- (f) In a relational database a referential integrity constraint is specified with the help of :
- (i) Primary key
 - (ii) Consistency key
 - (iii) Foreign key
 - (iv) None of the above
- (g) Object based data models are used in describing the abstraction of the following level (5) :
- (i) Only physical
 - (ii) Conceptual and view
 - (iii) Physical and conceptual
 - (iv) None of the above
- (h) Which of the following is not logical database structure ?
- (i) Network
 - (ii) Relational
 - (iii) Chain
 - (iv) Tree

- (i) Every BCNF is in :
- (i) 3NF
 - (ii) 1NF
 - (iii) 2NF
 - (iv) None of the above
- (j) The database model that uses a series of two-dimensional tables or files to store information is :
- (i) Object-Oriented Database Model
 - (ii) Hierarchical-Oriented Database Model
 - (iii) Relational-Oriented Database Model
 - (iv) Network-Oriented Database Model

Group – B

(Long-answer Type Questions)

Answer any **four** questions :

2. (a) What is the purpose of 'VIEW' operation in SQL ? Explain how is it created. List its advantages. 8
- (b) Explain what is meant by transaction. Why are transactions important. limit of operations in a DBMS. 7

3. (a) Suppose we have a functional dependency of the form $X \rightarrow Y$ on a relation R. Specify the conditions on X and Y such that X is a candidate key for R. How would you capture an arbitrary functional dependency $X \rightarrow Y$ in ER design. 8
- (b) What is multi-valued dependency ? Specify the significance of this dependency in case of 4NF. 7
4. (a) List all relational algebra operations and explain any one of them. 8
- (b) Identify entities, attributes and relationships giving functionalities and draw E-R diagram for the system. 7
5. (a) Explain any **four** of the following Database terms with the help of an example : 8
- (i) Data Independence
 - (ii) Domain
 - (iii) Foreign Key
 - (iv) Cardinality
 - (v) Referential Integrity

- (b) Explain the 3rd Normal Form with suitable example. 7
6. (a) List and explain Armstrong's Axioms. 8
- (b) Explain the purpose and utility of different normal forms. Specifically define and differentiate between third form and BCNF. 7
7. (a) With the help of well labelled diagram, explain the architecture of DBMS. 8
- (b) Give the advantages and disadvantages of Centralized Database. 7
8. (a) Explain any eight rules of Dr. E. F. Codd in brief. 8
- (b) Discuss the various types of Data Models in brief. 7
9. (a) What is referential integrity ? Explain with suitable examples. 8
- (b) State any seven advantages of RDBMS. 7

10. (a) Explain the purpose and scope of Database security and explain the following in terms of providing security for a database : authorization, views, backup and recovery, integrity, encryption and RAID technology. 8
- (b) Explain BCNF with the help of an example.

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