



ENGINEERING & MANAGEMENT EXAMINATIONS, JUNE - 2009  
**DATABASE MANAGEMENT SYSTEM-I**  
SEMESTER - 2



Time : 3 Hours ]

[ Full Marks : 70

**GROUP - A**

**( Multiple Choice Type Questions )**

1. Choose the correct alternatives for the following : 10 × 1 = 10

i) What is a field of data that can be used to locate a related field of record ?

- a) Data type
- b) Pointer
- c) Chain
- d) None of these.

ii) Which one of the following is the example of Dynamic Hashing ?

- a) Open Address Hashing
- b) Chain Hashing
- c) Linear Hashing
- d) All of these.

iii) Which of the following is an attribute that holds multiple values for a single entity ?

- a) Simple
- b) Composite
- c) Derived
- d) Multi-valued.

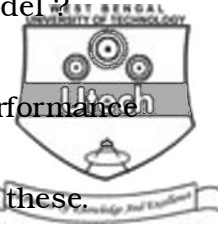
iv) Which of the following clauses can be present in an updatable view ?

- a) Group By
- b) Order By
- c) Distinct
- d) None of these.



v) What was the main drawback of the hierarchical model ?

- a) Lack of standardization
- b) Poor performance
- c) High cost
- d) None of these.



vi) Which is another name for weak entity ?

- a) Child
- b) Owner
- c) Dominant
- d) All of these.

vii) Which of the following is the type of metadata ?

- a) Operational
- b) EDW
- c) Data mart
- d) All of these.

viii) A table can have only one

- a) Primary key
- b) Alternate key
- c) Candidate key
- d) none of these.

ix) What is a set of possible data values called ?

- a) Degree
- b) Attribute
- c) Domain
- d) Cardinality.

x) Relations produced from an *E-R* model will always be in

- a) 1NF
- b) 2NF
- c) 3NF
- d) 4NF.



5

**GROUP – B**

**( Short Answer Type Questions )**

Answer any *three* of the following.



3 × 5 = 15

2. Explain the three schema architecture.
3. Explain generalization, specialization and aggregation in Entity Relation Diagram.
4. Consider the following table with their functional dependencies :

Employee ( Emp\_Id, Emp\_Name, Address, Design, Dept\_Id, Dept\_Name, Course, Duration )

Emp\_Id  $\emptyset$  Emp\_Name, Address, Design, Dept\_Id, Course

Dept\_Id  $\emptyset$  Dept\_Name

Course  $\emptyset$  Duration

Normalize the table upto BCNF.

5. Explain the Query optimization technique with relevant examples.
6. Write down the functions of a DBA.

**GROUP – C**

**( Long Answer Type Questions )**

Answer any *three* of the following.

3 × 15 = 45

7. What is Normalization ? What is its use ? Compare between BCNF and 3rd Normal form.

$R = ( A, B, C, D, E ) \quad F = \{ A \emptyset BC, CD \emptyset E, B \emptyset D, E \emptyset A \}$

Show that it is lossless decomposition.

2 + 3 + 4 + 6



8. Define ER model. What is an entity ? What do you mean by multi-valued attribute ?  
From the following information identify the entities, relationships and draw the ER diagram :



A store has different counters managed by different employees. A counter has item but no two counters have common items. Customers buy from different counters but bills are prepared at the bill counter only. Once in a month the performance of the persons managing different counters are evaluated in terms of sale. Items are also reviewed and slow moving items are identified.

2 + 2 + 2 + 9

9. Answer as directed for the following :

Hotel ( Hno,Name,Address ) Room ( Rno,Rtype,Hno,Price )

Booking ( Hno.Gno,Rno,Dt\_from,Dt\_to )

Guest ( Gno,GName,GAddress )

- Find the names of all guests who are staying in hotels either in Kolkata or Chennai. [ Relational Calculus ]
- Find the total number of guests in Hotel Taj. [ Tuple Relational Calculus ]
- List the number of rooms in each hotel. [ Domain Relational Calculus ]
- Find the room with the maximum price. [ SQL ]
- Find the hotel with 2nd maximum no. of rooms. ( SQL )

3 + 3 + 3 + 2 + 4

- 10 Write short note on any *three* of the following :

3 × 5

- Multi-level index
- Aggregation in ER model
- Three level data abstraction
- DBMS architecture
- Atomicity problem.



11. Establish the statement, "SQL is a relationally complete language". Consider the following schema of a relational database :

Sailors ( sid, sname, rating, age )

Reserves ( sid, bid, day )

Boats ( bid, bname, colour )



For each of the following queries write an expression for Relational Algebra OR Relational Calculus. ( any six )

- a) Find the names of sailors who have reserved boat 103.
- b) Find the names of sailors who have reserved a red boat.
- c) Find the colour of boats reserved by Biswarup.
- d) Find the names of sailors who have reserved at least one boat.
- e) Find the names of sailors who have reserved a red boat or a green boat.
- f) Find the names of sailors who have reserved a red boat and a green boat.
- g) Find the names of sailors with age over 20 who have not reserved a red boat.
- h) Find the names of sailors who have reserved all boats. 3 + ( 2 × 6 )

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END