

(Following Paper ID and Roll No. to be filled in your Answer Book)

**PAPER ID : 1432**

Roll No.

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### M.C.A.

(SEM. III) ODD SEMESTER THEORY EXAMINATION

2010-11

### DATA BASE MANAGEMENT SYSTEM

Time : 3 Hours

Total Marks : 100

Note : (1) Attempt all questions.

1. Attempt any four parts :

(5×4=20)

- What are data models ? What is a relational data model ? How relational data model is different from network data model ?
- What is a primary key ? How primary key is different from super key and candidate key ?
- What are advantages of database management system over flat file systems ?
- What is data independence ? What are the differences between logical data independence and physical data independence ?
- What are integrity constraints ? How these constraints can be enforced using SQL ?

- (f) What are Data Definition languages ? How data definition languages are different from data manipulation language ?

2. Attempt any **two** parts : (10×2=20)

- (a) Consider the following relational schema :

Employee (emp\_id, emp\_name, age, salary)

Works (emp\_id, Dept\_id)

Department (dept\_id, dept\_name, budget).

Answer the following queries using SQL :

- (i) Print the list of Name and Salary of all employees.
  - (ii) Print the list of name of department and their budget.
  - (iii) Find the name of all employees who work in a department having budget more than 1 million.
  - (iv) Find the name of all employees and their respective department where the age of the employee is less than 18 years.
- (b) What are differences in Insert, Delete and Update anomalies ? Explain with a suitable example how these anomalies are dealt with.
- (c) What do you mean by repetition of information and inability to represent information ? Explain why these properties may indicate a bad database design.

3. Attempt any **two** parts : (10×2=20)

- (a) What is BCNF ? How BCNF is different from Third Normal form ?

(b) What do you mean by Loss Less Join Decomposition ? Explain with an example why it is necessary to have a loss less join decomposition.

(c) Consider a relation schema  $R=(ABCDE)$  and the following set of functional dependencies :

$$F = (A \rightarrow B, BC \rightarrow E, ED \rightarrow A).$$

(i) List all keys for R.

(ii) Is R in 3NF ? Justify your answer.

(iii) Is R in BCNF ? Justify your answer.

4. Attempt any **two** parts : (10×2=20)

(a) What are recoverable schedules ? How recoverable schedules are different from cascade less schedule ? Discuss with example, why it is necessary to have schedules that are both recoverable and cascade less.

(b) What are Time Stamps ? Explain how time stamps can be used to decide serializability order of the transactions.

(c) What are deadlocks ? Discuss how deadlocks can be detected using a wait for graphs. Explain with an example.

5. Write short notes on any **four** of the following : (5×4=20)

(a) Log based recovery

(b) Two phase commit protocol

(c) Concurrency control in distributed database

(d) E-R model

(e) Conflict serializability

(f) Replication and Fragmentation.