

**2015**

**MCA**

**3rd SEMESTER EXAMINATION**

**DBMS**

**PAPER—MCA-301**

*Full Marks : 100*

*Time : 3 Hours*

*The figures in the margin indicate full marks.*

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

*Illustrate the answers wherever necessary.*

*Answer Q. No. 1 and any four from the rest.*

1. Answer any *five* questions : 5×2

- (a) What is Foreign key and what is it used for?
- (b) What is Weak Entity set? Give example.
- (c) What are the major functions of the database administrator?
- (d) Define and discuss data constraints.

*(Turn Over)*

- (e) What are the disadvantages in File Processing System ?
  - (f) Name and briefly describe the five SQL built-in functions.
  - (g) What is meant by query optimization ?
  - (h) What is Relationship ? What is degree of a Relation ?
2. (a) What is a data model ? Describe three-layer architecture of DBMS ? 3+3
- (b) What are the differences between logical data independence and physical data independence ? 3
- (c) What are the major responsibilities of the database administrator ? 3
- (d) Define the following terms :  
Primary Key, Composite Key *and* Unique Key. 3
3. Write short notes on following topics (any *five*) : 5×3
- (a) Relational Calculus ;
  - (b) Update anomalies ;
  - (c) File Processing System ;
  - (d) BCNF ;
  - (e) Functional Dependency ;
  - (f) Binary lock.

4. Consider the following relations :

5×3

Hotel (*Hno*, Name, Address)

Room (*Rno*, Rtype, Hno, Price)

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

Guest (*Gno*, GName, GAddress)

Write the queries in SQL to :

- (a) Find the names of all guests who are staying in hotels either in 'Mindapore' or in 'Kolkata'.
  - (b) Find the total no. of guests in 'Hotel Taj'.
  - (c) List the no. of rooms in each hotel.
  - (d) Find the room with maximum price.
  - (e) Find the hotel with 2nd minimum no. of rooms.
5. (a) Why normalization is used in database? 2
- (b) Write the drawbacks of normalization process. 3
- (c) Describe the update anomalies with examples. 5
- (d) Find the highest normal form for the following relation : 5
- R(ABCDE) with following FD's :
- F = {AB → C, BC → D, CD → E}

6. (a) What is the purpose of query optimization? 3
- (b) Describe two-phase locking protocol. 2
- (c) Write ACID properties of a transaction. 3
- (d) Why does the recovery process necessary in transaction? 3
- (e) Describe the state diagram of transaction management system. 4

***Internal Assessment — 30***

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