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 : \(5 \times 2\)

(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?

(b) What are the differences between logical data independence and physical data independence?

(c) What are the major responsibilities of the database administrator?

(d) Define the following terms:
   Primary Key, Composite Key and Unique Key.

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:

- Hotel \((Hno, \text{Name}, \text{Address})\)
- Room \((Rno, \text{Rtype}, Hno, \text{Price})\)
- Booking \((Hno, Gno, Rno, \text{Dt}\_\text{from}, \text{Dt}\_\text{to})\)
- Guest \((Gno, \text{GName}, \text{GAddress})\)

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?  
(b) Write the drawbacks of normalization process.  
(c) Describe the update anomalies with examples.  
(d) Find the highest normal form for the following relation:

\[ R(ABCDE) \] 

with following FD’s:

\[ F = \{AB \rightarrow C, BC \rightarrow D, CD \rightarrow E\} \]
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