

BCA 3rd Semester Examination, 2019

DATABASE MANAGEMENT SYSTEM

PAPER –2104

Full Marks : 100

Time : 3 hours

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

The figures in the right-hand margin indicate marks

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

Illustrate the answers wherever necessary

1. Answer any *five* questions : 2 × 5

(a) Define Theta join with example.

(b) What is the use of UPDATE Command ?
Explain with examples.

- (c) Explain the difference between instances and schemas.
- (d) What is the difference between a logical and a physical records.
- (e) Write advantages of database management system over file processing system.
- (f) What is a Composite Key ? Give example.
- (g) Write a security feature of DBMS.
- (h) What do you mean by functional dependency ?

2. (a) Why normalization is required ? 3

- (b) Consider the relation R (A, B, C, D, E, F, G, H) with functional dependency set as

$$FD = \{A \rightarrow C; B \rightarrow CG; AD \rightarrow EH; C \rightarrow DF; A \rightarrow H\}$$

On the basis of the given details, perform following tasks :

- (i) Determine key for relation R
- (ii) Decompose R into 2NF, 3NF and finally in BCNF. 3 + 9

3. (a) Discuss the external view, internal view and conceptual view in three-tier architecture. How are these different schema layers related to concepts of logical and physical data independence. 6 + 3
- (b) What is cardinality ratio? What is the difference between procedural and non-procedural DML? 2 + 2
- (c) What do you mean by integrity constraint? 2
4. (a) Define the concept of aggregation with a suitable example. 4
- (b) Define a foreign key. Why is the concept needed? How does it play a role in the join operation? 1 + 2 + 2
- (c) What is a derived key? Give example. 1 + 2
- (d) What is weak entity set? Explain with suitable example. 3
5. Consider the following relational database :
- Employee (e-id, e-name, salary, address, hire date)
- Manages (e-id, manager-id)

Write SQL/Relational algebra expression for the following queries : 5 × 3

- (a) Write all information of employees including their manager names.
 - (b) Find the difference between maximum and minimum salaries of employees.
 - (c) Find names of employees who are less than five years in company.
6. (a) Construct an E-R diagram for the following problem :
- A store has different counters managed by different employees. A counter has different items, but no two counters have common items. Customers buy from different counters but bills are prepared at bill counter only. Once in a month performance of persons managing counters is evaluated in terms of sales. Items are also reviewed and slow-moving items are identified. 10
- (b) Distinguish between single-valued vs multi-valued attributes. 3

(c) Count number of tables those are required for implement above database [Q. No. 5 (a)]. 2

7. Write short notes on (any *three*) : 5 × 3

(i) Dependency Preserving Decomposition

(ii) Object Oriented Database

(iii) Relational Calculus

(iv) Generalization

(v) Indexing.

[*Internal Assessment* : 30 Marks]
