

**NTK/KW/15/7439**

**Faculty of Engineering and Technology**  
**Fifth Semester B.E. (Computer Science Engg.)**  
**(C.B.S.) Examination**

**DATA BASE MANAGEMENT SYSTEM**

Time : Three Hours]

[Maximum Marks : 80

**INSTRUCTIONS TO CANDIDATES**

- (1) All questions carry marks as indicated.
- (2) Solve **SIX** questions as follows :  
Que. No. **1 OR** Que. No. **2**  
Que. No. **3 OR** Que. No. **4**  
Que. No. **5 OR** Que. No. **6**  
Que. No. **7 OR** Que. No. **8**  
Que. No. **9 OR** Que. No. **10**  
Que. No. **11 OR** Que. No. **12**
- (3) Illustrate the answers with necessary figures/drawings wherever necessary.
- (4) Assume suitable data wherever necessary.

1. (a) Describe the overall architecture of DBMS. 8
- (b) What do you mean by data Independence ? 3
- (c) What are the different data base languages ? 3

**OR**

2. (a) Describe PL/SQL structure and give significance of each section. 6
- (b) Consider below schema and answer the following in SQL :
 

Sailor (Sid, Sname)

Boat (Bid, Bname, Color)

Booking (Sid, Bid, Booking\_date)

  - (i) Find Name of Sailors whose Name start with letter 'A'. 1
  - (ii) Give Name of sailor who have booked 'Red' color boat. 2
  - (iii) Find Name of sailor, Boat Name whose booking on date 01-Dec.-2014. 2
  - (iv) Change Name of sailor to BBB whose first name starts with letter 'Y'. 2

- (v) Find all the boats with 'blue' color boat. 1

3. (a) Define the following terms :
  - (i) Candidate keys
  - (ii) Super key
  - (iii) Alternate key
  - (iv) Primary key
  - (v) Foreign key. 5
- (b) Let  $R = (A, B, C)$  and let  $r_1$  and  $r_2$  both be relations on schema  $R$ . Give the expression in both tuple relational calculus and domain relational calculus that equivalent to the relational algebra.
  - (i)  $\Pi_{A,B}(r_1)$
  - (ii)  $\sigma_B = 19(r_2)$
  - (iii)  $r_1 \cup r_2$
  - (iv)  $r_1 \cap r_2$
  - (v)  $r_1 - r_2$ . 8

**OR**

4. (a) Give the importance of defining a View. How they are implemented ? Also state the reason which may arise when one attempts to update a view.

5

(b) Explain with example Integrity constraints. 4

(c) Explain the significance of joins in Relational model. 4

5. (a) Explain why B<sup>+</sup> tree is proffered over B-tree. Construct B<sup>+</sup> tree for the following set of key values 1, 4, 7, 10, 17, 21, 31, 25, 18, 19, 20, 28, 42 having n = 4 and n = 6. 8

(b) Write short notes on :

(i) Primary and Secondary Indexing

(ii) Sparse and Dense Indexing. 6

**OR**

6. (a) Define Normalization. Explain 1NF, 2 NF and 3 NF. 6

(b) Compute F<sup>+</sup>, (ABE)<sup>+</sup> and (AB)<sup>+</sup> for the relation R = {A, B, C, D, E} with following functional dependency :

A → BC

CD → E

B → D

E → A. 5

(c) What is Bitmap Indexing ? 3

7. (a) Explain the different phases involved in Query processing ? 6

(b) Describe the different Evaluation plan. Why left approach is more preferable ? 4

(c) What do you mean by Materialization ? How pipelining overcome materialization ? 3

**OR**

8. (a) What is Query Optimization ? Give various technique of Query Optimization. 7

(b) Let relations R<sub>1</sub>(A, B, C) and R<sub>2</sub>(C, D, E) have following properties : R<sub>1</sub> has 20,000 tuple and R<sub>2</sub> has 45000 tuples where 25 tuples of R<sub>1</sub> on one block and 30 tuples of R<sub>2</sub> on one block. Compute number of block access required using each of the following join strategies of R<sub>1</sub> ⋈ R<sub>2</sub> :

(i) Block Nested loop join

- (ii) Nested loop join
  - (iii) Merge join
  - (iv) Hash join. 6
9. (a) What are the different buffer management Techniques ? 6
- (b) Define transaction. What are the different states of transactions ? Give ACID properties of transactions. 7

**OR**

10. (a) State the reasons for occurrence of deadlock. Suggest its prevention method. 7
- (b) Explain two phase commit protocol in detail. 6
11. (a) Write a short note on Checkpoint. 4
- (b) Describe the issues in Data Security. 5
- (c) Briefly explain failure classification. 4

**OR**

12. Write short notes on (any **three**) : 13
- (i) Data Mining
  - (ii) Data Warehousing
  - (iii) Web Databases
  - (iv) Distributed Databases.