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.

MVM—47099   1   (Contd.)

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^+ tree is proffered over B-tree. Construct B^+ 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^+, $(ABE)^+$ and $(AB)^+$ for the relation R = {A, B, C, D, E} with following functional dependency :

   $A \rightarrow BC$

$$CD \rightarrow E$$

$$B \rightarrow D$$

$$E \rightarrow A.$$ 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 $R_1(A, B, C)$ and $R_2(C, D, E)$ have following properties : R_1 has 20,000 tuple and R_2 has 45000 tuples where 25 tuples of R_1 on one block and 30 tuples of R_2 on one block. Compute number of block access required using each of the following join strategies of $R_1 \bowtie R_2$:

(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.