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^+ 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 → 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_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.