CBCS SCHEME

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18CS53

Fifth Semester B.E. Degree Examination, June/July 2023
Database Management Systems

Time: 3 hrs. Max. Marks: 100

Note: ***Answer any FIVE full questions, choosing ONE full question from each module.***

Module-1

1 a. With neat diagram, describe "Three Schema Architecture" and "Data Independence". **(06 Marks)**

b. Discuss the different types of user friendly interfaces and the types of user who typically use each. **(06 Marks)**

c. With a neat diagram, explain the component modules of DBMS and their interactions. **(08 Marks)**

OR

2 a. Explain with the block diagram, the different phases of database design. **(06 Marks)**

b. Draw an ER diagram of Banking Database. Assume your own entities (minimum 4), attributes and relationships. Specify 3NF tables. **(14 Marks)**

Module-2

3 a. Briefly discuss different type of update operations on relational database. Show an example of a violation of the referential and entity integrity in each of the update operation. **(08 Marks)**

b. Consider the two tables. Show the result of the following :

T_1

A	B	C
10	a	5
15	b	8
25	a	6

T_2

P	Q	R
10	b	6
25	c	3
10	b	5

i) $T_1 ⟖_{T_1.B = T_2.Q} T_2$

ii) $T_1 ⟕_{T_1.A = T_2.P} T_2$

iii) $T_1 \bowtie_{(T_1.A = T_2.P) \text{ AND } (T_1.C = T_2.R)} T_2$

iv) $T_1 - T_2$

(08 Marks)

c. List and explain the characteristics of Relations. **(04 Marks)**

OR

4 a. Define the following :

i) Primary key ii) Super key
iii) Foreign key iv) Candidate key. **(04 Marks)**

b. Discuss all the forms of ALTER Commands with example. **(06 Marks)**

c. Consider the following tables :
Works (Pname , Cname , Salary)
Lives (Pname , Street , City)
Located – in (Cname , City)
Write the following queries in Relational algebra :
i) List the names of the people who work for the Company 'Wipro' along with the cities they live in.
ii) Find the names of the persons who do not work for 'Infosys'.
iii) Find the people whose salaries are more than that of all of the 'Oracle' employees.
iv) Find the persons who works and lives in the same City.
v) Find the names of the companies that are located in every city where the Company Infosys is located. **(10 Marks)**

Module-3

5 a. Describe the six clauses in the syntax of an SQL retrieval query. Show what type of constructs can be specified in each of six clauses. Which of the six clauses are required and which are optional? **(04 Marks)**

b. How are Triggers and Assertions defined in SQL? Explain. **(06 Marks)**

c. Consider the following tables :
Branch (Bname , Bcity , Assets)
Account (Accno , Bname , Accbal)
Loan (Loan no , Bname , LoanAmt)
Customer (Cname , Cstreet , CCity)
Depositer (Cname , Accnum)
Borrow (Cname , Loannum)
Write the following queries in SQL :
i) Find all loan numbers for loans made at cantonment branch with loan amounts greater than 20000.
ii) Find the names of all customers whose street address includes 'Main'.
iii) Find the average balance for each branch, if average balance is greater than 12000.
iv) Find the Customers who have an account, at all the branches located in "Mysure".
v) Find all Customers who do not have loan at the bank, but do have an account. **(10 Marks)**

OR

6 a. How is view created and dropped? What problems are associated with updating view? **(06 Marks)**

b. What is Cursor? With program segment, explain retrieving of tuples with embedded SQL in C. **(06 Marks)**

c. Explain the concept of Create , Passing parameter , Call stored procedure from JDBC. **(08 Marks)**

Module-4

7 a. Briefly explain the informal design guidelines used as measure to determine the quality of relations schema design. **(08 Marks)**

b. What do you mean by Closure of Attributes? Write an algorithm to find closure of attributes. **(06 Marks)**

c. Given below are two set of FDs for a relation R(A, B, C, D, E). Are they equivalent?
i) $A \rightarrow B$, $AB \rightarrow C$, $D \rightarrow AC$, $D \rightarrow E$
ii) $A \rightarrow BC$, $D \rightarrow AE$. **(06 Marks)**

OR

8 a. What do you mean by Multivalued Dependency? Explain the 4NF with example. **(06 Marks)**

b. Define First , Second and Third Normal forms by taking an example. **(06 Marks)**

c. Consider the following Relation R(A, B, C, D, E, F, G, H, I, J) with FDs$\{A, B\} \rightarrow C$, $A \rightarrow \{D, E\}$, $D \rightarrow J$, $B \rightarrow \{F, G\}$, $F \rightarrow \{H, I\}$.
How would you Normalize completely? **(08 Marks)**

Module-5

9 a. Describe the problems that occur when concurrent execution uncontrolled. Give examples. **(06 Marks)**

b. Explain the transaction support in SQL. **(06 Marks)**

c. Consider the three transactions T_1 , T_2 and T_3 and schedule S1 & S2 given below. Determine whether each schedule is serializable or not? If serializable, write down the equivalent serial schedule (S).

T_1 : $R_1(x)$, $R_1(z)$, $W_1(x)$;
T_2 : $R_2(x)$, $R_2(y)$, $W_2(z)$, $W_2(y)$;
T_3 : $R_3(x)$, $R_3(y)$, $W_3(y)$;
S_1 : $R_1(x)$, $R_2(z)$; $R_1(z)$; $R_3(x)$; $R_3(y)$; $W_1(x)$; $W_3(y)$; $R_2(y)$; $W_2(z)$; $W_2(y)$;
S_2 : $R_1(x)$; $R_2(z)$; $R_3(x)$; $R_1(z)$; $R_2(y)$; $W_1(x)$; $W_2(z)$; $W_3(y)$; $W_2(y)$; **(08 Marks)**

OR

10 a. What is Schedule? Explain Conflict and view Serializibility schedule with example. **(08 Marks)**

b. Briefly discuss the two phase locking protocol used in concurrency control. **(06 Marks)**

c. Briefly explain ARIES recovery process. **(06 Marks)**

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