

Time: 3 Hours

2/12/23

Max. Marks: 80

NB:

1. Question No. 1 is compulsory and solve any THREE questions from remaining questions
2. Assume suitable data if necessary
3. Draw clean and neat diagrams

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|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| Q.1 Attempt any four                                                                                                                                                                                                                                                                                                                                                                 |       |
| a. Explain different types of attributes with example.                                                                                                                                                                                                                                                                                                                               | 5     |
| b. Define Generalization & Specialization.                                                                                                                                                                                                                                                                                                                                           | 5     |
| c. Explain total participation & partial participation                                                                                                                                                                                                                                                                                                                               | 5     |
| d. Explain different Database Languages.                                                                                                                                                                                                                                                                                                                                             | 5     |
| e. Draw Transaction state diagram                                                                                                                                                                                                                                                                                                                                                    |       |
| Q.2. a. Define functional dependencies and different types of functional dependencies:<br>Consider the relation scheme $R = \{E, F, G, H, I, J, K, L, M, N\}$ and the set of functional dependencies $\{\{E, F\} \rightarrow \{G\}, \{F\} \rightarrow \{I, J\}, \{E, H\} \rightarrow \{K, L\}, K \rightarrow \{M\}, L \rightarrow \{N\}\}$ on R.<br>What is the Candidate key for R? | 10    |
| b. Construct an ER diagram for a Banking Management System                                                                                                                                                                                                                                                                                                                           | 10    |
| Q.3.a Explain different types of operations in relational algebra.                                                                                                                                                                                                                                                                                                                   | 10    |
| b. Consider the following schema for the institute Library.<br>Student (Rollno, Name, Age, Branch)<br>Book (ISBN, Title, Author, Publisher)<br>Issue (Rollno, ISBN, Date_of_Issue)                                                                                                                                                                                                   | 10    |
| Write SQL queries for the following statements.                                                                                                                                                                                                                                                                                                                                      |       |
| i. List Roll Number and Name of all students of the branch CSE.                                                                                                                                                                                                                                                                                                                      |       |
| ii. Find the name of students who have been issued a book published by ABC publisher.                                                                                                                                                                                                                                                                                                |       |
| iii. List title of all books and their author issued by student Prashant.                                                                                                                                                                                                                                                                                                            |       |
| iv. Find the Total number of students in each branch.                                                                                                                                                                                                                                                                                                                                |       |
| Q.4.a. Consider a relation R with five attribute ABCDE. You are given the following dependencies:                                                                                                                                                                                                                                                                                    | 10    |
| $A \rightarrow B$ $BC \rightarrow E$ $ED \rightarrow A$                                                                                                                                                                                                                                                                                                                              |       |
| i. List all keys for R                                                                                                                                                                                                                                                                                                                                                               |       |
| ii. Is R in 3NF.                                                                                                                                                                                                                                                                                                                                                                     |       |
| iii. Is R in BCNF.                                                                                                                                                                                                                                                                                                                                                                   |       |
| b. What is Normalization? Explain 1NF, 2NF, 3NF with example.                                                                                                                                                                                                                                                                                                                        | 10    |

Q.5. a Explain types of Integrity Constraints with example.

10

b. Check whether the given schedule S is Conflict serializable or not. Also define. different types of serializability.

10

T1	T2	T3	T4
			R(A)
	R(A)		
		R(A)	
W(B)			
	W(A)		
		R(B)	
	W(B)		

Q.6

Write notes on **any two**

a) ACID Properties.

10

b) DDL and DCL commands.

10

c) Keys in DBMS.

10

d) Log based Recovery

10

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