

B.Tech CSE/ECE 8th Semester(MOOCs 3), 2023

Paper Name : DATABASE MANAGEMENT SYSTEM **Paper Code** : MOOCS 3
Time : 3 Hours **Maximum Marks** : 75

SECTION A

(35 Marks)

All questions are compulsory in this Section. All Questions are of 5 Marks.

Q.N	Questions	Marks	CO	BL
1	Draw and explain the detailed 3 tier architecture of DBMS.	5	CO 1	L1
2	Discuss the advantages of using a DBMS over a file management system.	5	CO 1	L1
3	Explain the common data types available in SQL.	5	CO 2	L2
4	Describe the concept of Domain and Referential Integrity.	5	CO 3	L3
5	'BCNF is found to be stricter than 3NF'. Justify the statement.	5	CO 3	L3
6	Consider a relation scheme $R = (A, B, C, D, E, H)$ on which the following functional dependencies hold: $\{A \rightarrow B, BC \rightarrow D, E \rightarrow C, D \rightarrow A\}$. Write the candidate keys of R?	5	CO 3	L4
7	By considering an example, show how to reduce access time with primary index.	5	CO 2	L2

SECTION B

(40 marks)

Attempt **ANY FOUR** Questions from this Section.

All Questions are of 10 Marks.

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Q.N	Questions	Marks		
1	Consider the following relational schema: Employee (empno,name,office,age) Books(isbn,title,authors,publisher) Loan(empno, isbn,date) Write the following queries in relational algebra and SQL both. a. Find the names of employees who have borrowed a book Published by	10	CO 5	L4

	McGraw-Hill? b. Find the names of employees who have borrowed all books Published by McGraw-Hill? c. Find the names of employees who have borrowed more than five different books published by McGraw-Hill? d. For each publisher, find the names of employees who have borrowed?			
2	Define normalization ? Explain 1NF, 2NF, 3NF Normal forms .	10	CO 2	L3
3	Consider the transactions T1, T2, and T3 and the schedules S1 and S2 given below. T1: r1(X);r1(Z);w1(X);w1(Z) T2: r2(Y);r2(Z);w2(Z) T3: r3(Y);r3(X);w3(Y) S1: r1(X);r3(Y);r3(X);r2(Y);r2(Z); w3(Y);w2(Z);r1(Z);w1(X);w1(Z) S2: r1(X); r3(Y); r2(Y); r3(X); r1(Z); r2(Z); w3(Y); w1(X); w2(Z); w1(Z) Analyze which one of the schedules is conflict-serializable?	10	CO 2	L4
4	Consider a B+-tree in which the maximum number of keys in a node is 5. Calculate the minimum number of keys in any non-root node?	10	CO 3	L3
5	What do you mean by a transaction? What are ACID properties of transaction? Discuss the transaction state diagram and different states.	10	CO 2	L2
6	Write short notes on any two: a) Hashing Technique b) Set Operations In Relational Algebra c) Outer Join d) Concurrency Control	10	CO 1	L3