	Reg. No.:	
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TERM END EXAMINATIONS (TEE) – December 2021- January 2022

Programme	**B.Tech - – AI&ML,BHI**	Semester	**Fall 2021-22**
Course Name	**Database Management Systems**	Code	**CSE3001**
Faculty Name	**Ms.E.Suganya**	Slot/Class no.	**A11+A12+A13/ 0365**
Time	**1½ hours**	Max. Marks	**50**

Answer ALL the Questions

Q. No.		Question Description	Marks
PART - A – (3 x 10 = 30 Marks)			
1	(a)	(i) Analyse the difference between two-tier and three-tier architectures of a database management system with neat sketch.	6
		(ii) Let E1 and E2 be two entities in an E/R diagram with simple single-valued attributes. R1 and R2 are two relationships between E1 and E2, where R1 is one1 to-many and R2 is many-to-many. R1 and R2 do not have any attributes of their own. Calculate the minimum number of tables required to represent this situation in the relational model and explain?	4
		OR	
	(b)	Consider a database with the following schema: Person (name, age, gender) (name) is a key Frequents (name, pizzeria) (name, pizzeria) is a key Eats (name, pizza) (name, pizza) is a key Serves (pizzeria, pizza, price) (pizzeria, pizza) is a key Write relational algebra expressions for the following queries. a. Find all pizzerias frequented by at least one person under the age of 18. b. Find the names of all females who eat either mushroom or pepperoni pizza (or both). c. Find the names of all females who eat both mushroom and pepperoni pizza. d. Find all pizzerias that serve at least one pizza that Amy eats for less than $10.00. e. Find the names of all people who frequent every pizzeria Serving at least one pizza they eat. f .Find the names of all people who frequent only Pizzerias serving at least one pizza they eat.	10
2	(a)	Consider the following schema for a Library Database: BOOK (Book_id, Title, Publisher_Name, Pub_Year) BOOK_AUTHORS (Book_id, Author_Name) PUBLISHER (Name, Address, Phone) BOOK_COPIES (Book_id, Branch_id, No-of_Copies) BOOK_LENDING (Book_id, Branch_id, Card_No, Date_Out, Due_Date) LIBRARY_BRANCH (Branch_id, Branch_Name, Address)	10

		Write SQL queries to 1. Retrieve details of all books in the library – id, title, name of publisher, authors, number of copies in each branch,etc. 2. Get the particulars of borrowers who have borrowed more than 3 books, but from Jan 2017 to Jun2017 3. Delete a book in BOOK table. Update the contents of other tables to reflect this data manipulation operation. 4. Partition the BOOK table based on year of publication. Demonstrate its working with a simplequery. 5. Create a view of all books and its number of copies that are currently available in the Library.	
		OR	
	(b)	Create a relation R = (A, B, C, D, E) with the following functional dependencies: {CE → D, D → B, C → A}. a. Find all candidate keys. b. Identify the best normal form that R satisfies (1NF, 2NF, 3NF, or BCNF).	10
3	(a)	Create B+ tree to insert the following key values (the order of the tree is three) 32, 11, 15, 13, 7, 22, 15, 44, 67, 4 What is the maximum number of node splitting operations that may take place?	10
		OR	
	(b)	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 and explain why ?	10
Part - B – (2 x 10 = 20 Marks)			
4		What are aggregate functions? Describe each function with an example.	10
5		A power failure that occurs while a disk block is being written could result in the block being only partially written. Assume that partially written blocks can be detected. An atomic block write is one where either the disk block is fully written or nothing is written (i.e., there are no partial writes). Suggest schemes for getting the effect of atomic block writes with the following RAID schemes. Your schemes should involve work on recovery from failure. a. RAID level 1 (mirroring) b. RAID level 5 (block interleaved, distributed parity)	10
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