MANAV RACHNA
Vidyanatariksha

MANAV RACHNA UNIVERSITY
Declared as State Private University vide Haryana Act 26 of 2014

DEPARTMENT OF COMPUTER SCIENCE & TECHNOLOGY

"T3 Examination, Sept-2020"

SEMESTER	**3rd**	**DATE OF EXAM**	**23/09/2020**
SUBJECT NAME	**Database Management System**	**SUBJECT CODE**	**CSH202B-T**
BRANCH	**CSE/DTE/DSML**	**SESSION**	**I**
TIME	**8:30am - 10:30 am**	**MAX. MARKS**	**60**
PROGRAM	**B.Tech (CSE/DTE/DSML)**	**CREDITS**	**4**
NAME OF FACULTY	**Ms. Hanu Bhardwaj, Dr.Jyoti Pruthi, Gaganjot Kaur, Sarika Seth, Shreya Malhotra**	**NAME OF COURSE COORDINATOR**	**Ms. Shreya Malhotra**

Note: *Part A : All questions are compulsory. It consists of 6 questions,Q1 to Q6 (5 marks each)*
Part B: All questions are compulsory. Consists of 2 questions,Q7 & Q8 (15 marks each)

Q.NO.		QUESTIONS	MARKS	CO ADDRESSED	BLOOM'S LEVEL	PI
PART -A	**Q1**	Suppose that we have an ordered file with r=40,000 records stored on a disk with block size B=1024 bytes. File records are of fixed length and unspanned with record length R=100 bytes. Find the following. a) blocking factor b) number of blocks needed for primary index c) if key field is 10 byte long and block pointer is of 5 byte then find number of block access required with indexing.	1+2+2	CO1	BT3	1.4.1
	Q2	account(acc_id,br_name,balance) depositor(cust_name,acc_id) loan(loan_id,br_name,amount) borrower(cust_name,loan_id) Write the following query in relational algebra. a)Find names of all customers that have either a bank account or a loan at the bank b) Find all customers that have an account but not a loan c) Selects the account IDs of all accounts with a balance of $300 or more	2+2+1	C02	BT3	1.4.1

	Q3	Using SQL perform (i)Create table employee (eno char(3), ename varchar(20), eloc varchar(20), salary number(5)) PRIMARY KEY – eno ename cannot be left blank,default eloc is chennai (ii) Find the employee names and their corresponding location for the employes having salary Between 30000 and 50000. (iii)Create a view which is based on the details regarding the employee location and their corresponding employee names.	1+2+2	CO2	BT3	1.4.1
	Q4	The locking information for several transactions is shown below. Produce a wait-for-graph (WFG) for the transactions and determine whether deadlock exist or not. Transaction Data item Lock mode T1 Q Shared T2 P EXCLUSIVE Q EXCLUSIVE T3 Q SHARED T4 P EXCLUSIVE Q EXCLUSIVE	5	C05	BT3	1.4.1
	Q5	Consider a relation schema R (A , B , C , D) with the functional dependencies A → B and C → D. Determine whether the decomposition of R into R1 (A , B) and R2 (C , D) is lossless or lossy.	5	C04	BT3	1.4.1

	Q6	Consider the following two transactions:
		T31: read(A);
		read(B);
		if A = 0then B := B + 1;
		write(B).
		T32: read(B);
		read(A);
		if B = 0then A := A + 1;
		write(A).
		Add lock and unlock instructions to transactions T31 and T32, so that they observe the two-phase locking protocol. Can the execution of these transactions result in a deadlock?
			5	C04	BT3	1.4.1

PART -B	**Q7**	(a) Draw an ER diagram of the conceptual schema for another part of a University database, described as follows: • Academic staff, general staff and students are the only persons at the university. • Each person is either an academic staff, or a general staff, or a student. • A person is uniquely identified by a PerId (person's ID), and has a Name, and an Address. An Address is composed of HouseNo, Street, and City. • A characteristic property of a student is that she/he has at least one Major and one NoOfPts (number of points) for each major. • An academic staff has a Position and an AcQual (academic qualification). • A general staff has a GenPos (general position). • An academic staff teaches at most one course, whereas a student takes at least one course. • A course is uniquely identified by a CourId (course ID), and has a CourName (course name). • Each course is taught by at least one academic staff, and can be taken by many students, but there may be courses that are not taken by any students. • Each course can use more than one textbook, but there may be courses with no textbook. • A textbook is uniquely identified by the course which uses the book, and by an OrdNo. The attribute OrdNo is the ordinal number of the book in the list of the textbooks of a particular course. A book also has a Title. (b) Convert the drawn ER diagram to various relations	10+5	CO3	BT4	1.4.1
	Q8 (a)	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) Find whether S1 & S2 schedules are conflict serializable or not?	10+5	CO4, CO5	BT3	1.4.1
	Q8 (b)	Given R(A,B,C,D,E) with the set of FDs, F{AB→CD, ABC → E, C → A} (i) Find any two candidate keys of R (ii) What is the normal form of R? Justify.				
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