Roll Number:		
Thapar Institute of I	Engineering and Technology Patiala	
Computer Scien	ce and Engineering Department MakeUp Test	
BE Second Year (4th Semester) 18 April, 2023	UCS310: Database Management System	
Time: 2 Hours, Max Marks:30	Instructor: Dr Geeta Kasana	

Note: Attempt all questions. All parts of a question must be answered in order. Assume any missing data.

21	a) Compare F	ile processing	system and DBN	AS on follov	ving character	istics:	2+3
	i) Dur	ability i	i) Isolation				
	b) Explain the	three-tier arch	nitecture of DBN	1S with diag	ram.		
	Service Alexander		employee table	-		e in SOI	2+3
2 2		ier the following					4.1.
	EMPNO	EMP_NAME	DEPT_NAME	SALARY	DOJ	Branch	
	1	Amit	Production	45000	12-Mar-00	Bangalore	
	2	Amit	HR	70000	03-Jul-02	Bangalore	
	3	Sunita	Management	120000	11-Jan-01	Mysore	
	b) Differ		n following with	n help of suit		/SQL syntax:	
	b) Differ i) Le ii) St iii) C	rentiate betwee oft outer join ar rong and Weak o-related queri	n following with nd Right outer jo k Entity ies and Sub-Que	n help of suit oin ries	able example		my 5
2 3	b) Differ i) Le ii) St iii) C Design an EF keys and ass A publishing who specialize being special publications. suppliers. Or	rentiate betwee eft outer join ar rong and Weak co-related queri action in the company produce in one particulation in a particulation in the esupplier can can buy many leach book resupplier can can buy many leach buy many leach buy many leach supplier can can buy many leach supplier can buy many leach s	n following with and Right outer job Entity lies and Sub-Que he following desertions books on vicular subject. The lar area, each take equires some is supply many it	ries scription; Mald be clear. various subjecte company of the company of the sole respondence of the company o	ake sure care ects. The book employs edite insibility for e	Inalities, primares are written by a bors who., not necediting one or mornese items suppleables from the pulshop owner only.	essarily re book ied by blisher.
Q3	b) Differ i) Le ii) St iii) C Design an EF keys and ass A publishing who specialize being special publications. suppliers. Or Shop owner are identified Given a relat	rentiate betwee eft outer join ar rong and Weak co-related queri action in the company produce in one particulation in a particulation in the company produce in one particulation in a	n following with and Right outer job Entity lies and Sub-Que he following desertions books on vicular subject. The lar area, each take equires some is supply many it	ries scription; Marious subjected tems for putterns. Shop cook can be bond set of Fundamental for the cook can be bond set of Fundamental for puterns.	ake sure care ects. The book employs edite insibility for e ablication. The owner buys be ought by one	dinalities, primares are written by a sors who., not necediting one or mornese items suppletooks from the pulshop owner only.	authors essarily e book ied by blisher.

Roll Number:

Thapar Institute of Engineering and Technology Patiala Computer Science and Engineering Department

End Sem Test

BE Second Year (4th Semester) 13th May, 2023	UCS310: Database Management System
Time: 3 Hours, Max Marks:40	Coordinators: Dr Geeta Kasana, Dr. Ranjeet Kumar Ranjan
Instructors: Geeta Kasana, Ranjeet Kumar Ranjan, Kaushal, Rakesh Kumar Yadav, Sanjeev Rao	Deepak Kumar Dewangan, Sumit Sharma, Manisha

Note: Attempt all parts of a question and answer them in order. A new question must start from new page. Assume any missing data.

Q1	a)	Consider a	relation	R (A, E	B, C, D, E) with FDs:	6+2
	-				$AB \rightarrow C$,	
					$AC \rightarrow B$,	
					$BC \rightarrow A$, and	
			2		$D \rightarrow E$.	
					idate keys of relation R.	
					D, E) in 2NF? If not, justify your answer and convert into 2NF.	
1					D, E) in 3NF? If not, justify your answer and convert into 3NF.	
	iv	. Is relati	ion R (A	, B, C,	D, E) in BCNF or not? Justify your answer	
	100					
			betwee	n lossy	and lossless decomposition used in Normalization with a suitable	
	exa	ample.			A Delivery of the second secon	
Q2	a)				ir schedules using read and write operation on a data item X, denoted	2+2+4
				spective	ely. Find the following schedules are conflict serializable or not, with	
		explanation	1.			
		S1: r	1(X); r2	(X); wi	$(X); r_3(X); w_2(X)$	
		S2: r2	2(X); r1	(X) ; W_2	$(X); r_3(X); w_1(X);$	
				The second secon	$X); w_2(X); w_1(X);$	
	0		The state of the s	200 000 000 000 000 000	(X) ; $r_1(X)$; $w_1(X)$;	
		01. 12	2(22), 11.	2(22), 23	(12), 11(12), 11(12),	
4	b)	Consider th	e follow	ing sch	edule S of transactions T1, T2, T3, T4:	
100	0,	T1	T2	T3	. T4	
			Read(X)			
				Read(Z)		
			1	Write(X)		
				Commit		
		Read(Z)			*	
		Write(X) Commit				
		Commit				
		1	Write(Y)		1,1	
			Read(Z) Commit			
				1-11-	Read(X) Read(Y)	
				100	Commit	
		_ :	. 1			
					escribe whether the above Schedule is conflict serializable, view	
		serializable	or both.	7		
					11 1 1 1 Find and a better the given exhadula S is Cascadeless	
7.	c)				verable schedule. Find out whether the given schedule S is Cascadeless	
		schedule or	not. Jus	tify you	ir answer.	
					D (C) D (D) D (D) W (A) C W (C) W (D) W (D) C- C-	
×		S: R ₁ (A	1) R ₂ (C) R ₃ (A)	$R_1(C)$ $R_2(B)$ $R_3(B)$ $W_1(A)$ C_1 $W_2(C)$ $W_3(B)$ $W_2(B)$ C_3 C_2 .	
1		W D G	V) 1 V	U(V)	present read and write operations on data item X by transaction To	
		Where, Ri()	x) and V	v _i (X) re	present read and write operations on data item X by transaction T _i	3
		respectively	and Ci	is comn	nit of transaction T _i .	

Q3	a) Explain Strict Two-Phase Locking (Strict 2PL) protocol and its advantages with respect to basic 2PL. For the given schedule below, explain whether Basic 2PL and Strict 2PL can be applicable	5+3
	or not.	
	11 12	
	Read(A) Write(A) Read(B)	
	Read(A) Read(C)	
	b) Consider a database with objects X and Y and assume that there are two transactions TI and T2. Transaction TI reads objects X and Y and then writes object X. Transaction T2 reads objects X and Y and then writes objects X and Y. Using the given operations of transactions T1 and T2, construct the schedules which show the following conflicts. Also justify how conflicts occur. (i) write-read conflict (ii) read-write conflict (iii) write-write conflict	
Q4	 a) Consider the table Emp (empno, ename, deptno, salary) to write a PL/SQL program to increase the salary of an employee according to the following rule: Salary of the department number 10 employees increased by 1000. Salary of the department number 20 employees increased by 500. Salary of the department number 30 employees increased by 500. Store the employee number, old salary and new salary in another table named temp having three columns empno, old_salary, new_salary. 	6+2
	b) Write the PL/SQL program to define and raise a user defined exception named <i>invalid_id</i> . for above table Emp, if [<i>empno</i> <= 0].	
Q5	a) Convert the following E-R diagram to Tables. Explicitly mention primary and foreign keys for each of the table.	5+3
	DOOR* STREET CITY STATE PIN COURSE_ID COURSE_ID	
	STUDENT_NAME ADDRESS COURSE_ID COURSE_NAME STUDENT M Allends N COURSE HAS LECTURER_ID LECTURER_ID LECTURER_NAME COURSE_NAME SUBJECT_NAME	
	b) List any six responsibilities performed by Database Administrator (DBA).	

Q5	Write a PL/S separate PL/	SQL stored function SQL program through	n to find the factorial ugh which user will e	of a number. enter the num	Call the stored function in a ber.	5
Q 6	convert the f	ng table is in 1NF. Collowing table into der highest Norma	next higher normal	tional depend forms based o	encies exist in this table and on the data given on the	5
	Cust_id	Course_NO	Enrollment Date	Fees	Residence	
	Cust_id	Course_NO M01	Enrollment Date	Fees 50000	Residence Mohali	
			Part a month of the control of the c			
	C01	M01	01-01-2000	50000	Mohali	

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210 5	
BE Second Year (4th Semester) 13th May, 2023	UCS310: Database Management System
Time: 3 Hours, Max Marks: 40	Coordinators: Dr Geeta Kasana, Dr. Ranjeet Kumar Ranjan
Instructors: Geeta Kasana, Ranjeet Kumar Ranjan, Kaushal, Rakesh Kumar Yadav, Sanjeev Rao	Deepak Kumar Dewangan, Sumit Sharma, Manisha

Note: Attempt all parts of a question and answer them in order. A new question must start from new page. Assume any missing data.

1	a) (Consider a re	lation R	(A. B.	C, D, E) with FDs:	6+2
• •	-, -	JOHOIGOI WIE		, , -,	$AB \rightarrow C$,	
1	(6				$AC \rightarrow B$	
					$BC \rightarrow A$, and	
					$D \rightarrow E$.	
•		Determin	ne all the	e candid	ate keys of relation R.	
	i. ii.	In malatio	D /A	BCT	F) in 2NF? If not, justify your answer and convert into 2NF.	
		Is relatio	n D (A	BCT	, E) in 3NF? If not, justify your answer and convert into 3NF.	
1	iii.	Is relatio	- D (A	D, C, D	, E) in BCNF or not? Justify your answer	
	iv.	. Is relatio	n K (A,	D, C, L	, E) III BETTI OF HOLL STORY ,	
1		:cc		lossy a	nd lossless decomposition used in Normalization with a suitable	
			between	lossy a	id lossiess decomposition does in	
	exan	nple.				
1			0.11		schedules using read and write operation on a data item X, denoted	2+2+
	a) (Consider the	tollow	ing fou	ly. Find the following schedules are conflict serializable or not, with	
				pective	ly, rind the following schedules are confine section	
	(explanation.			TD (77)	
		S1: r1	$(X); r_2($	X); wi	$(X); r_3(X); w_2(X)$	
		S2: r2	$(X); r_1($	X); w2($X); r_3(X); w_1(X);$	
		S3: r3	(X): r2(X); r1($X); w_2(X); w_1(X);$	
		S4: T2	(X): W2	(X): r3($(X); r_1(X); w_1(X);$	
	h)	Consider the	follow	ing sche	edule S of transactions T1, T2, T3, T4:	
	b)	T1	T2	T3	. T4	
		7	Read(X)			
1				Read(Z)		
1				Write(X)		
1		22		Commit	with the same and	
1		Read(Z)				
		Write(X)				
	9	Commit				
- 1			Write(Y)			-
			Read(Z) Commit			
			Сощин			1
					Read(X) Read(Y)	
				1	Commit	
			· vys		and the delegation conflict serializable, view	
		Using prece	edence g	graph, d	escribe whether the above Schedule is conflict serializable, view	
		serializable	or both	. 15		
	1				the given schedule S is Cascadeless	S
	c)	Explain Ca	scadele	ss Reco	verable schedule. Find out whether the given schedule S is Cascadeless	1 3
	,	schedule or	not. Ju	stify yo	ur answer.	
	-	Solication	50		C W (C) W (P) W ₂ (P) C ₁ C ₂	
		S: R:(A) R2(C	C) R ₃ (A) $R_1(C)$ $R_2(B)$ $R_3(B)$ $W_1(A)$ C_1 $W_2(C)$ $W_3(B)$ $W_2(B)$ C_3 C_2 .	
	1	D. 101(2	-,,			1
	1				1 to Y by transaction I:	
		Where R:	X) and	W _i (X) r	epresent read and write operations on data item X by transaction T_i mit of transaction T_i .	-

