

**B.M.S COLLEGE OF ENGINEERING, BANGALORE-19****(Autonomous Institute, Affiliated to VTU)****Department Name: CSE****Third Internals****Course Code: 19CS4DCDBM****Course Title: Database Management System****Semester: 4th A, B, C, D****Maximum Marks:40****Date:13/07/2021****Faculty Handling the Course:**

Dr.K.V.N, Prof.V.B.M, Dr.S.K.S, Dr.K.P.M

Instructions: Internal choice is provided in Part C.**PART-A****For COs which are mapped of low strength in Course Articulation Matrix****Total 5 Marks (No Choice)**

Q.No.	Question	Marks
1)	Draw a state diagram, discuss the typical states that a transaction goes through during execution.	05

PART-B**For COs which are mapped of medium strength in Course Articulation Matrix****Total 15 Marks (No Choice)**

Q.No.	Questions	Marks																		
2a)	<p>Consider the following relation and Functional Dependencies check whether the dependencies are satisfying BCNF relation if not explain why by showing violation. What are the keys of this relation?</p> <p>i) $AB \rightarrow C, AB \rightarrow D, C \rightarrow A, D \rightarrow B$</p> <p>ii) $rollno, courseid \rightarrow email; email \rightarrow rollno$</p>	05																		
2b)	<p>Consider the Following Schedule which consists of two transactions T1 and T 2. Apply Locking Technique for those operations in the transactions such that the database will lead to consistent state. Item value A=500.</p> <table><tr><th>Time</th><th>T1</th><th>T2</th></tr><tr><td>4:00 PM</td><td>Read(A)</td><td></td></tr><tr><td>4:01 PM</td><td>A=A-100</td><td>Read(A)</td></tr><tr><td>4:02 PM</td><td>Write(A)</td><td>A=A-40</td></tr><tr><td>4:03 PM</td><td></td><td>Write(A)</td></tr><tr><td>4:04 PM</td><td></td><td></td></tr></table>	Time	T1	T2	4:00 PM	Read(A)		4:01 PM	A=A-100	Read(A)	4:02 PM	Write(A)	A=A-40	4:03 PM		Write(A)	4:04 PM			05
Time	T1	T2																		
4:00 PM	Read(A)																			
4:01 PM	A=A-100	Read(A)																		
4:02 PM	Write(A)	A=A-40																		
4:03 PM		Write(A)																		
4:04 PM																				

2c)	Consider the following two schedules and check which schedule is recoverable Justify with the reason. S1:r1(x),w1(x),r1(y),w1(y),r2(x),w2(x),C2;C1 S2:r1(x),w1(x);r2(x);r1(y);w2(x);w1(y);C1;C2	05
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PART- C

Q.No.	Questions	Marks
3 a)	Define the concept of conflict operations and which of the following schedules is conflict serializable. For each serializable schedule,determine the equivalent serial schedule using precedence graph i. r1(x);r3(x);w1(x);r2(x);w3(x) ii. r1(x);r3(x);w3(x) w1(x);r2(x) iii. r3(x);r2(x);w3(x); r1(x);w1(x). iv. r3(x);r2(x);r1(x);w3(x);w1(x)	10
3 b)	Assume an immediate database modification scheme. Consider the following log consisting transactions T1, T2, and T3:Give the reasons which transactions require Redo and undo operations why? 1. (Start, T1); 2. (Write, T1, P, 500, 600); 3. (Write, T1, Q, 400, 500); 4. (Commit, T1); 5. checkpoint 6. (Start, T2); 7. (Write, T2, P, 600, 550); 8. (Write, T2, Q, 500, 450); 9. (Commit, T2); 10.(Start T3) 11. (Write,T3,P,700,600) 12. (Write,T3,Q, 50,30)	10

4 a) Consider the Relation R(S,P,D) and the instances of S,P,D as shown below
Check whether the Decomposed relation {sp and pd} is satisfying Lossless Join or not. Give reasons.

S	P	D
S1	P1	D1
S2	P2	D2
S3	P1	D3

Consider the Table 4.1 as shown below. Does the Relation is having a Multivalued Dependency? If so what is it? What will be the Final decompositions Look like? Is the Relation is having any Functional Dependency?

Course	Teacher	Book
Physics101	Green	Mechanics
Physics101	Green	Optics
Physics101	Brown	Mechanics
Physics101	Brown	Optics
Maths301	Green	Mechanics
Maths301	Green	Vectors

OR

Consider the Two schedules shown here in the table 3.1. Apply Two phase Locking Protocol and rewrite the Schedule. Why we need two phase locking?

T1	T2
Read_lock(y)	Read_lock(z)
Read_item(y)	Read_item(z)
Unlock(y)	Unlock(z)
Write_lock(z)	Write_lock(y)
Read_item(z)	Read_item(y)
Z=Z+y	Y=Z+y
Write_item(z)	Write_item(y)
Unlock(z)	Unlock(y)