

End Semester Examination

May-June 2023

COS1070B - Relational Database Management System

Schedule ID: 13174

Faculty/School	Faculty of Science	Term	Semester II
Program	FYBCA	Duration	1 Hours 30 Minutes
Specialization	--	Max. Marks	40

Read the instructions provided for every question properly before attempting the answer.

Section 1 - [7 Questions, 8 Marks] (5 X 8 Marks) Answer any 5 questions

1	<p>a) Explain the syntax of stored procedure in PSQL</p> <p>b) Consider the following relational database employee (<u>eno</u>,ename,salary,joindate,age,city) project (<u>pno</u>,pname,ptype,startdate,budget) emp_pro(eno,pno,n_of_hrs) Write a procedure which accepts employee number as input and returns ename ,salary and age for the given employee</p>	8 marks	CO1	Creating
2	<p>a) What is cursor? State and explain steps implement a cursor</p> <p>b) Consider the following relation bus (<u>bus_no</u> int , capacity int , depot_name varchar(20), route_no int) route (<u>route_no</u> int, source char(20), destination char(20),no_of_stations int) Write a stored function using cursors to accept a route number and display the details of the buses that run on the given route</p>	8 marks	CO1	Creating

3	<div>a) State and explain states of a transaction</div> <div>b) Consider below schedule</div> <table><tr><td>T1</td><td>T2</td><td>T3</td></tr><tr><td>READ(A)</td><td>READ(C)</td><td>READ(B)</td></tr><tr><td>A=A+10</td><td>C=C+10</td><td>B=B+10</td></tr><tr><td>WRITE(A)</td><td>WRITE(C)</td><td>WRITE(B)</td></tr><tr><td>READ(B)</td><td>READ(A)</td><td>READ(C)</td></tr><tr><td>B=B+90</td><td>A=A+10</td><td>C=C+10</td></tr><tr><td>WRITE(B)</td><td>WRITE(A)</td><td>WRITE(C)</td></tr></table> <div>Give any 2 non-serial schedules serializable to serial schedule <T1, T2></div>	T1	T2	T3	READ(A)	READ(C)	READ(B)	A=A+10	C=C+10	B=B+10	WRITE(A)	WRITE(C)	WRITE(B)	READ(B)	READ(A)	READ(C)	B=B+90	A=A+10	C=C+10	WRITE(B)	WRITE(A)	WRITE(C)	8 marks	CO2	Understanding
T1	T2	T3																							
READ(A)	READ(C)	READ(B)																							
A=A+10	C=C+10	B=B+10																							
WRITE(A)	WRITE(C)	WRITE(B)																							
READ(B)	READ(A)	READ(C)																							
B=B+90	A=A+10	C=C+10																							
WRITE(B)	WRITE(A)	WRITE(C)																							

4	<p>a) Following is a list of events in an interleaved execution of set of transactions T1,T2,T3, and T4 with two phase locking protocol</p> <table><tr><td>Timestamp</td><td>Transactions</td><td>Operation</td><td></td><td></td></tr><tr><td>t1</td><td>T1</td><td>Lock (P,X)</td><td></td><td></td></tr><tr><td>t2</td><td>T2</td><td>Lock (Q,X)</td><td></td><td></td></tr><tr><td>t3</td><td>T3</td><td>Lock (R, X)</td><td></td><td></td></tr><tr><td>t4</td><td>T4</td><td>Lock (P,S)</td><td></td><td></td></tr><tr><td>t5</td><td>T1</td><td>Lock (Q, S)</td><td></td><td></td></tr><tr><td>t6</td><td>T2</td><td>Lock (R, X)</td><td></td><td></td></tr><tr><td>t7</td><td>T3</td><td>Lock (P, X)</td><td></td><td></td></tr><tr><td>t8</td><td>T4</td><td>Lock (R, S)</td><td></td><td></td></tr><tr><td>t9</td><td>T2</td><td>Abort</td><td></td><td></td></tr></table> <p>Construct a wait-for graph for the above request. Is there deadlock exist in the system ?Justify</p> <p>b) Following are the log entries at the time of system crash.</p> <p>[Start-transaction, T1] [Write-item, T1, B, 100] [Commit, T1] [Checkpoint] [Start-transaction, T2] [Write-item, T2, A, 80] [Write-item, T2, B, 70] [Checkpoint] [Commit, T2] [Start-transaction, T5] [Write-item, T5, D, 20] [Write-item, T5, A, 30] [Checkpoint] [Start-transaction, T3] [Write-item, T3, B, 20] [Write-item, T3, D, 20] [Write-item, T3, Z, 20] [Start-transaction, T4] [Write-item, T4, C, 10] ; _____ System Crash</p> <p>If immediate update with checkpoint is used, what will be the recovery process?</p>	Timestamp	Transactions	Operation			t1	T1	Lock (P,X)			t2	T2	Lock (Q,X)			t3	T3	Lock (R, X)			t4	T4	Lock (P,S)			t5	T1	Lock (Q, S)			t6	T2	Lock (R, X)			t7	T3	Lock (P, X)			t8	T4	Lock (R, S)			t9	T2	Abort			8 marks	CO2,CO3Applying
Timestamp	Transactions	Operation																																																			
t1	T1	Lock (P,X)																																																			
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6	a) State and explain any four features of NO SQL databases. b) What is graph database explain, explain its components using suitable example.	8 marks	CO4	Remembering
7	a) Discuss domain constraint and referential integrity constraint. Explain the syntax and use of grant command and revoke command b) Explain mandatory access control method for database security	8 marks	CO3	Understanding

END OF QUESTION PAPER