

WEST BENGAL UNIVERSITY OF TECHNOLOGY

MCA-403

DATA BASE MANAGEMENT SYSTEM II

Time Allotted: 3 Hours

Full Marks: 70

The questions are of equal value.

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable. All symbols are of usual significance.

GROUP A(Multiple Choice Type Questions)

1. Answer *all* questions.

 $10 \times 1 = 10$

- (i) Which one of the following is not a desirable property of a transaction?
 - (A) atomicity

- (B) durability
- (C) concurrency
- (D) consistency
- (ii) System log table is required
 - (A) to concurrently execute transactions
 - (B) to recover from failure
 - (C) to make a non serial schedule serializable
 - (D) none to tehese
- (iii) Which of the following is not true in case of a sub query
 - (A) a sub query must produce a single column of data as its result
 - (B) order by clause can be specified in a sub-query
 - (C) a sub query can not be a union
 - (D) none of the above

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- (iv) In which of the following cases a correlated sub query improve SQL performance
 - (A) only a few rows are retrieved through the outer query and especially when outer query's where clause which limits the number of rows retrieved can use an index
 - (B) the co-related inner queries are performed through an index scan
 - (C) all of the above
 - (D) none of the above
- (v) Which of the following is the command that reads SQL statements form DBRMs and produces a mechanism to access data as directed by the SQL statements?
 - (A) Compile
- (B) DCLGEN (C) BIND
- (D) EXECUTE
- (vi) Which of the following is the size of the data item chosen as the unit of protection by a concurrency control program?
 - (A) Lock

(B) Blocking factor

(C) Granularity

- (D) None of the above
- (vii) Which of the following is a recovery technique that does not need logs?
 - (A) Deferred update
- (B) Immediate update
- (C) Shadow paging
- (D) None of the above
- (viii) Which of the following is the process by which a user's identity is checked?
 - (A) Authentication
- (B) Authorization
- (C) Access control
- (D) All of the above
- (ix) Which of the following is a function of a Distribution Database Management System?
 - (A) Distributed query processing (B) Replicated data management
 - (C) Distributed data recovery
- (D) All of the above
- (x) Which of the following are the embedded SQL delimiters for COBOL?
 - (A) EXEC and END-EXEC
 - (B) EXEC SOL and END-EXEC
 - (C) EXECUTE SQL and END-EXECUTE
 - (D) None of the above

GROUP B

		Answer any three	Snort Answer 1 y e questions.	pe Questions	s)		3×5 = 15
2.		What is granular	ity of locking? Stat	e Tree Protoco	1.	•	5
3.		Describe the Thomas write rule in Timestamp ordering? What do you mean by Temporary update problem? Explain with example.					2 3
4.		Explain Cascadi What is trivial M	ng Abort with exan	nple?	,		3 2
5.		Discuss the advantage of Timestamp Ordering Protocol over 2PL protocol.					3
5.	(b)	Discuss the st	efits of rigorous 2PI ructure of log of How checkpoint can	f transaction		What is	2 2+1+2
			GROU	P C			
(Long Answer Type Questions)							
	Answer any three questions.						$3 \times 15 = 45$
7.	(a)	What is scheduschedule?	le? When a schee	dule is said to	o be a	complete	1+2
	(b)	When are the	fference between s two operations sa to be conflict serial	id to be in c	,		2+2+2
	(c)		v paging. Define wo		wait-die	schemes.	3+3
8.	(a) Two data items A and B are to be updated by two transactions T1 and T2 respectively. T2 is nested with T1. Considering the relevant read and write statements only, the transactions are shown below T1 read A;						3+3+3
		T2	read B;				
			write B; :	 (1)			
			write A; : ← end T1;	- (2)			

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	<i>a</i> >	At the time of crash recovery, what would be the content of the log and what recovery action will be taken if (i) crash occurs at (1) under the deferred update principle. (ii) crash occurs at (1) under the immediate update principle. (iii) crash occurs at (2) under the deferred update principle.	
	(b)	Define functional dependency with suitable example. Show that every MDV is a JD.	3+3
9.	(a)	Discuss Intension Shared and Intension Exclusive locks.	4
	(b)	What is cursor? How does it work in database?	1+3
	(c)	How to declare host variables in embedded SQL? Discuss different parts of embedded SQL and their features?	1+3
	(d)	Write a database trigger that will automatically generate the	3
		employee number when you want to insert values into the employee table.	•
10.	(a)	Discuss conflict and view serializability.	4
	• •	What is phantom deadlock?	
	• •	Differentiate LOG and CHECKPOINT?	2 4
	` '	With the help of bind variable and arguments with OUT write a procedure that accept the name of an employee and return the salary plus the 10% of his salary of that employee with that OUT variable. Display the salary outside the procedure. This procedure will fire on the emp table. The table consists of the following attributes: emp_code varchar2 (30), ename varchar2 (30), Sal number, dept_no number.	5
11.	(a)	(i) For the relation $R = (A, B, C, D, E)$ and $F.D = \{B \rightarrow D, CD \rightarrow E, E, \rightarrow A, A \rightarrow BC\}$. R is decomposed into $R1 = \{A, B, C, E\}$ and $R2 = \{B, D\}$. Is	2+1+2
		the above decomposition lossless join decomposition? (ii) Give R (A, B, C) and set of functional dependencies	· · · · .
		$\{A \rightarrow BC, B \rightarrow C, A \rightarrow B, AB \rightarrow C\}$	
		(a) Find the extraneous attributes.	•
	, /L)	(b) Find the canonical cover.	21211
	(D)	Describe briefly the following terms which are needed for distributed database design	2+2+1
		(i) Data Fragmentation	
		(ii) Data Replication	
	(-)	(iii) Data Allocation	212
	(c)	Illustrate the features of object oriented database. What are the advantages and disadvantages of using object oriented database management system?	2+3