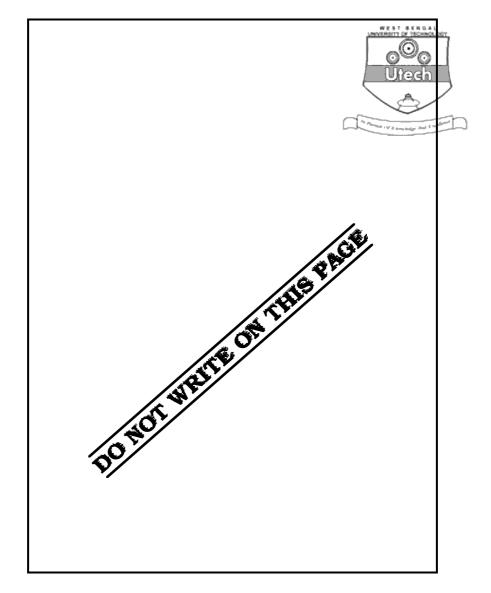
CS/M.Tech (MSS)/SEM-2/MSS-203/09 DATABASE MANAGEMENT SYSTEM (SEMESTER - 2)

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CS/M.Tech (MSS)/SEM-2/MSS-203/09 ENGINEERING & MANAGEMENT EXAMINATIONS, JULY - 2009 DATABASE MANAGEMENT SYSTEM (SEMESTER - 2) Time: 2 Hours] [Full Marks: 70														
INS	STRUCTIONS TO 1	HE CANDIDA	TES :	1										
1.	This Booklet is a Question-cum-Answer Booklet. The Booklet consists of 32 pages . The questions of this concerned subject commence from Page No. 3.													
2.	You have to answer paper.	You have to answer the questions in the space provided marked 'Answer Sheet'. Write on both sides of the												
3.	Fill in your Roll No	Fill in your Roll No. in the box provided as in your Admit Card before answering the questions.												
4.	Read the instruction	Read the instructions given inside carefully before answering.												
5.		You should not forget to write the corresponding question numbers while answering.												
6.	Do not write your name or put any special mark in the booklet that may disclose your identity, which will render you liable to disqualification. Any candidate found copying will be subject to Disciplinary Action under the relevant rules.													
7.	Use of Mobile Pho	ne and Program	mable (Calcula	tor is	totall	y pro	hibited	l in the	exam	inatio	n hall		
8.	You should return the booklet to the invigilator at the end of the examination and should not take any page of this booklet with you outside the examination hall, which will lead to disqualification .													
9.	Rough work, if nece	ssary is to be do	ne in th	nis boo	klet oı	nly and	l cross	it thro	ough.					
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CS/M.Tech (MSS)/SEM-2/MSS-203/09 DATABASE MANAGEMENT SYSTEM

SEMESTER - 2

Time: 2 Hours]

Full Marks : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Answer any *five* questions from the following.

 $5 \times 14 = 70$

- 1. Use an entity-relationship diagram to depict the following requirements for a restaurant:
 - * The restaurant employs a number of chefs. A record is kept of each chef's name, address, phone number and salary.
 - * Each chef can prepare a number of meals. The name of the meal and the price of the meal is recorded.
 - * Each meal consists of a number of ingredients. The name of the ingredient and the quantity required for the particular meal is recorded.
 - * These meals are ordered by customers. A record is kept of the customers name, address and phone number. A record is kept of the time and date the meal is ordered.
 - State any assumptions made in the design of E-R diagram.
 - Also convert it to its equivalent relational model and use the normalization technique to reduce the redundancy. 7 + 4 + 3
- 2. a) What benefit does rigorous two phase locking provide? How does it compare with other forms of two phase locking?
 - b) Discuss about the deadlock prevention schemes and compare the performance also.
 - c) Write a short note on "Dirty read" problem.

6 + 6 + 2

3. a) Describe validation based concurrency control protocol. Why is it called optimistic concurrency control?



- b) Compare the performance of Hash join and the Sort-Merge join for joining two tables R and S. (6 + 2) + 6
- 4. a) Discuss the roll of checkpoints in recovery.
 - b) Let the relation R have attributes A, B, C, D, E, F, G, H, I, J and suppose it satisfies the following FDs:

$$ABD \rightarrow E$$

$$AB \rightarrow G$$

$$B \rightarrow F$$

$$C \rightarrow J$$

$$CJ \rightarrow I$$

$$G \rightarrow H$$

Is this an irreducible set? What are the candidate keys?

- c) How does multilevel indexing improve the efficiency of searching an index file ? Which one is the most efficient index structure as per your opinion ? Justify your answer. 5 + 3 + 6
- 5. a) Consider the following relational schema:

Finance (did, budget, sales, expenses)

Draw a relational algebra tree for the following SQL query and transform the query tree into a more efficient form.

SELECT D. dname, F. budget

FROM Emp E, Dept D, Finance F

WHERE E.did = D. did AND D.did = F.did AND D.floor = 1 AND E.sal > = 59000 AND E.hobby = "Gardening"

b) Consider a simple selection query of the form $\sigma_{R.attribute\ op\ value}$ (R). What are the alternative access paths in each of these cases (i) There is no index and the file is not sorted (ii) There is no index but the file is sorted ?



- c) Why a hash structure is not a best choice for a search query on which range queries are likely? 7 + 4 + 3
- 6. a) Distinguish between serial and serializable schedule through example.
 - b) Why is cascadelessness of schedules desirable? What is a recoverable schedule?
 - c) Why do database systems support concurrent execution of transactions, in spite of the extra programming effort needed to ensure that concurrent execution does not cause any problems? 4 + 6 + 4
- 7. Write short notes on any *two* of the following :

7 + 7

- a) Shortcoming of relational model
- b) Shadow paging
- c) Multi-valued dependency and 4 NF
- d) Problems of lock-based protocol.

END