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DOON UNIVERSITY, DEHRADUN

School of Technology

End Semester Examination: May-June, 2016

Program : MCA (Integrated) Semester-IV

Course: STM-526 [Database Management Systems]

No. of Printed Pages: 3

Roll No. _____

Time Allowed: 3 Hours

Total Marks: 50

Note: Question paper is divided into three sections A, B & C. Marks distribution is given alongside. Follow the instruction as given in each section.

SECTION: A

(10*1=10)

Attempt any ten of the following. Write your answer in about 50 Words.

Que-1

- (i) List any eight applications of DBMS.
- (ii) Define instance and schema?
- (iii) Define data model?
- (iv) What is storage manager?
- (v) What is a data dictionary?
- (vi) Define single valued and multivalued attributes.
- (vii) What are two pitfalls (problem) of lock-based protocols?
- (viii) Discuss about different types of attributes.
- (ix) Define the "integrity rules".
- (x) What are axioms?
- (xi) What do you understand by Codd's 3rd Rule: *Systematic treatment of null values*?
- (xii) What is transaction?
- (xii) What is first normal form?

SECTION: B

Attempt any four of the following. Write your answer in about 250 Words.

(5*4=20)

Que-2 What is the system log used for? What are the typical kinds of records in a system log? What are transaction commit points, and why are they important?

OR

List all the SQL queries under DDL, DML, DCL and TCL along with their syntax.

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Que-3 Consider a relation schema $R=(ABCDE)$ and the following set of functional dependencies:

$$F = (A \rightarrow B, BC \rightarrow E, ED \rightarrow A).$$

- (i) List all keys for R.
- (ii) Is R in 3NF ? Justify your answer.
- (iii) Is R in BCNF ? Justify your answer.

Que-4 What do you mean by repetition of information and inability to represent information ? Explain why these properties may indicate a bad database design.

OR

What do you understand by triggers. Write a trigger for the employee(ID,NAME,AGE,ADDRESS,SALARY) table that would fire for INSERT or UPDATE or DELETE operations performed on the CUSTOMERS table. Update the salary by 10% for those employees whose age is more than 45 years.

Que-5 Draw the Architecture of a DBMS and briefly explain functions of each component.

OR

Define the phases of two phase locking protocol

Que-6 Draw an E-R diagram for Banking System.

SECTION: C

Attempt all of the following.

Que-7 Differentiate between Parallel and Distributed Databases. (2)

OR

Explain about External, Conceptual and Internal Schemes. Give suitable example.

Que-8 What do you mean by Loss Less Join Decomposition? Explain with an example why it is necessary to have a loss less join decomposition. (3)

Que-9 What are the ACID properties of a transaction? How are these useful ? Discuss in detail (5)

Que-10 For each of the following schedules, answer the following: (10)

(i) Is it serializable, i.e., equivalent to some serial schedule ? All read/write instructions for the transactions are shown. Show your reasoning. Note that a schedule may not be conflict serializable but may still be serializable.

(ii) Would the schedule be allowed under 2 Phase Locking protocol? Show the reasoning and/or the locations at which the locks could have been taken and released.

(i)

T1	T2
read(A)	
write(A)	
	read(A)
	write(A)
read(B)	
	read(B)
read(C)	
	write(B)

(ii)

T1	T2
	read(A)
read(A)	
write(A)	
	read(B)
read(B)	
write(B)	
	read(C)
	write(C)

(iii)

T1	T2
read(A)	
write(A)	
	write(A)
read(B)	
write(B)	
	read(C)
	write(C)
write(C)	