Reg. No.									

Manipal Institute of Technology

(A Constituent Institute of Manipal University)

I SEMESTER M. C. A.
END SEMESTER EXAMINATION – NOV/DEC 2015

SUBJECT: ADVANCED DATABASE MANAGEMENT SYSTEM [MCA 4104]

05-12-2015

Time : 3 hours | Max. Marks : 50

Instructions to Candidates

1. Answer ANY FIVE FULL questions.
2. Missing data may be suitably assumed.

1A Explain the following drawbacks of file-oriented system- Data redundancy and inconsistency, Concurrent-access anomalies, Security problems.

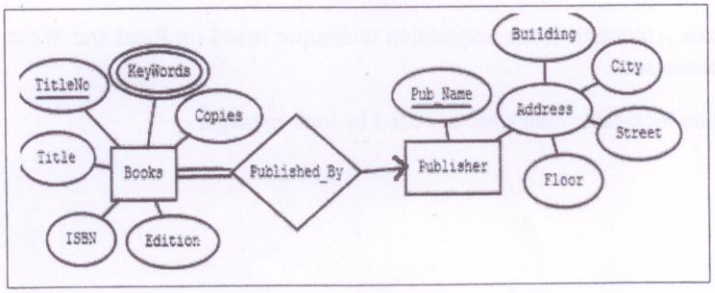
1B Discuss two methods to convert specialization into schema with an example.

1C Assume that database is stored on a disk subsystem having 40MB/sec transfer rate and 4msec average seek time. What is the time needed to access 10 blocks of data from database, where each block is of size 4KB and number of seeks involved is 5.

(5 + 3 + 2)

2A Discuss working, advantage & disadvantage of RAID 3 storage technique with figure.

2B Draw the schema diagram corresponding to the following ER diagram.



2C Derive the cost expression for the operation $\sigma_{ID=101}$ (Instructor) on Instructor (ID, Name) file having primary index on ID (unique) attribute.

(5 + 3 + 2)

3A Discuss the proof for- Union, Decomposition and Pseudo-transitivity rules using Armstrong axioms.

3B Write the relational algebraic expression for the following queries-

employee(emp_number,emp_name)
project(project_number,project_name,project_manger)
assigned_to(project_number,emp_number)

i. Find the number of employees working under each project manager.
ii. Find the employees who are working on all projects.
iii. Delete all the employees who are working under -'Networking' project.

3C Consider the relation **R(S, T, V, C, D, P)** with the FDs as follows-
F_c={S → **T, V → SC, SD→ PV**}, SD & VD are candidate keys.
Decompose **R** into **3NF** relations.

(5 + 3 + 2)

4A Describe different methods to represent variable-length records.

4B Explain merits & demerits of 3NF as compared to BCNF with an example.

4C Discuss advantages and disadvantages of B+ trees in comparison with indexed-sequential files.

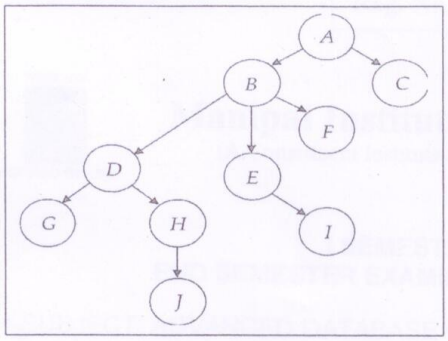
(5 + 3 + 2)

5A Answer the following

i. Discuss Automatic Lock acquisition technique based on Read and Write instructions in transactions.

ii. Explain lock-table data structure used by lock-manager.

5B Prepare a concurrent schedule for the transactions T_1, T_2, T3 using Tree protocol and database graph given below.



T1	T2	T3
A	D	B
D	H	E
G	J	I

5C Discuss benefits of pipelining technique & its two implementations in evaluating query expressions .

(5 + 3 + 2)

6A Write & discuss merge-join query algorithm with an example.

6B Write the serializable schedule for the following schedule with steps and reasons for each swap.

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

6C Describe different state of transaction with figure.

(5 + 3 + 2)

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