Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/MCA/SEM-4/MCA-403/2013

2013

DATABASE MANAGEMENT SYSTEM – II

Time Allotted : 3 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.

GROUP – A
(Multiple Choice Type Questions)

1. Choose the correct alternatives for the following : $10 \times 1 = 10$

   i) Normalization follows

   a) top down approach b) bottom up approach

   c) both (a) and (b) d) none of these.

   ii) Suppose R is a relation of n attributes $\{A_1, A_2, ..., A_n\}$ as a function of n. How many superkeys R has if only key is A_1 ?

   a) $2 * n$ b) $2 * (n - 1)$

   c) $2''''^{1}$ d) None of these.

   iii) F covers E implies

   a) every FD to E also in $F+$

   b) every FD of F also in $E+$

   c) both (a) and (b)

   d) none of these.

iv) To test equality with the NULL, operator ..... is used.

a) ▪ b) ..—

c) IS NULL d) none of these.

v) Cascading rollback is occurred due to deviation from the property

a) atomicity b) consistency

c) isolation d) durability.

vi) Which of the following ensures the atomicity of the transaction ?

a) Transaction management component

b) Application programmer

c) Concurrency control component

d) Recovery management component.

vii) Which of the following is not a level of data abstraction ?

a) Physical level b) Critical level

c) Logical level d) View level.

viii) Disadvantage of file system to store data is

a) data redundancy and inconsistency

b) difficulty in accessing data

c) data isolation

d) all of these.

ix) In an Entity-Relationship Diagram Rectangles represent

a) entity sets b) attributes

c) database d) tables.

x) Which of the following is not a Storage Manager Component ?

a) Transaction Manager b) Logical Manager

c) Buffer Manager d) File Manager.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following $3 \times 5 = 15$

2. Define trivial MVD. Give an example. 3 + 2

3. Define Serializable Schedule. Give an example. 4 + 1

4. Define 2PL. What do you mean by strictly 2PL ? Give an example. 2 + 2 + 1

5. Discuss deadlock recovery.

6. What do you understand by dependency preservation ?

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

7. a) Define Join Dependency (JD). What is Key Dependency (KD) ? 3 + 2

   b) Let us consider a relation schema R (*A, B, C, D, E*) with set of FD's { $A \rightarrow BCDE$, $C \rightarrow ABDE$, $D \rightarrow ABCE$ }. Check whether KD implies JD or not. 6

   c) Define PJNF. 4

8. a) Define Transaction. Describe different states of transaction. 2 + 4

   b) Explain Cascading Abort with an example. 4

   c) What are partial, alternate, artificial, compound and natural key ? 5

9. a) Discuss Shadow Page Scheme. 6

   b) Identify the basic features of an object oriented data model. 4

   c) What is a DML trigger ? What are the uses of trigger ? Give the syntax of the CREATE TRIGGER command and explain with an example. 5

10. a) For the relation R = (A, B, C, D) and FD F = { $A \rightarrow B$, $A \rightarrow C$, $C \rightarrow D$ } R is decomposed into R_1 = (A, B, C, P) and R_2 = (C, D). Is the above decomposition lossless join decomposition ? Does this decomposition preserve the dependency ? 5

b) Define DKNF. Consider the relation STUDENT (SID, Grade Level, Building, Fee) A constant is SID key. SID must not begin with digit 1. Domain definitions are as follows :

SID	in	*DDDD, D* is decimal digit
Grade level	in	{ *FR, SO, JR, SN, GR* >
Building	in	Char (4)
Fee	in	*DEC* (4)

Normalize the above relation to DKNF with explanation. 3 + 3

c) State the principle of Wound-Wait technique. 4

11. a) Explain the concept of distributed database. What are the advantages and functions of distributed database ? 8

b) What is Phantom problem ? Give an example. 2

c) State the three rules of concurrency control. 5

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