



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 $\{A_1, A_2, \dots, A_n\}$ 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^{n-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) \neq
 - 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 × 5 = 15

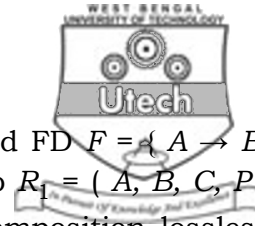
2. Define trivial MVD. Give an example. 3 + 2
3. Define Serializable Schedule. Give an example. 4 + 1
4. Define 2PL. What do you mean by strictly 2PL ? Give an example. 2 + 2 + 1
5. Discuss deadlock recovery.
6. What do you understand by dependency preservation ?

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. 3 × 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 → BCDE, C → ABDE, D → 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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