



Name : .....

Roll No. : .....

Invigilator's Signature : .....

**CS/M.Sc.(IS)/SEM-1/MI-104/2012-13**

**2012**

**DATABASE MANAGEMENT SYSTEM**

*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) A set of allowable values for one or more attribute is known as
    - a) Tuple
    - b) Domain
    - c) Parameter
    - d) none of these.
  - ii) 'ALTER' falls in which database language ?
    - a) DML
    - b) TCL
    - c) DDL
    - d) SDL.
  - iii) If 'DOB' is stored in database then 'age' falls in which category ?
    - a) Multivalued
    - b) Stored
    - c) Derived
    - d) Composite.



- iv) Varchar2 can hold character up to
  - a) 255
  - b) 2000
  - c) 200
  - d) 4000.
- v) Composite primary key should be defined at
  - a) column level
  - b) table level
  - c) creation level
  - d) custom level.
- vi) Attribute inheritance occurs in
  - a) generalization
  - b) specialization
  - c) aggregation
  - d) none of these.
- vii) Normalization of database is needed to
  - a) reduce data error
  - b) eliminate data redundancy
  - c) make more accurate data
  - d) none of these.
- viii) Relational Algebra is what type of language ?
  - a) Non-procedural language
  - b) Procedural language
  - c) Data manipulation language
  - d) Both (b) and (c).
- ix) The values of the attributes describe a particular
  - a) attribute
  - b) entity
  - c) instance
  - d) none of these.
- x) What are the transaction properties ?
  - a) ABCD property
  - b) ACID property
  - c) DEADLOCK
  - d) READ-WR property.



**GROUP – B**

**( Short Answer Type Questions )**

Answer any *three* of the following.

3 × 5 = 15

2. “All primary key is the super key but the converse is not true.” Clarify.
3. Explain the difference between external, internal & conceptual schemas. Distinguish between logical and physical data independence.
4. State the properties of a relational model.
5. Explain natural join operation in relational algebra with example.
6. Describe 3-level architecture of DBMS.

**GROUP – C**

**( Long Answer Type Questions )**

Answer any *three* of the following.

3 × 15 = 45

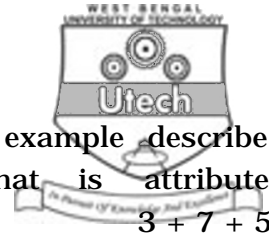
7.
  - a) Describe inference rules for functional dependencies.
  - b) What is functional dependency ?
  - c) What do you mean by full functional dependency ?

5 + 5 + 5

8. Write short notes on any *three* of the following :

3 × 5

- a) Normalization
- b) Relational algebra
- c) Data abstraction
- d) ACID property
- e) Advantages of RDBMS.



9. What is an E-R diagram ? With an example describe specialization & generalization. What is attribute inheritance ?

10. a) What do you mean by integrity constraint ? Describe.  
b) What is lossless decomposition ? Give example.  
c) Compute the closure of the set  $F$  of FDS for the relational schema,  $R = (A, B, C, D, E)$

$$A \rightarrow BC \quad CD \rightarrow E$$

$$B \rightarrow D \quad E \rightarrow A$$

List the candidate keys of  $R$ .

3 + 6 + 6

11. Given relational schemas are the apply SQL to solve the queries :

a) Sailor ( sid, SName, age, ratings )

Boat ( Bid, BName, Colour )

Reserve ( sid, Bid, Date )

- Find out the colour of the boat booked by the sailor named 'Ajay'.
  - Find out the date of booking of the boat named 'Interlake'.
  - Find out the details of the oldest sailors.
  - Find out the name of the boat which is booked by the sailor named 'Ram'.
- b) Explain 1 NF, 2 NF, 3 NF, BCNF.
- c) What is the difference between physical and logical data independence ? Explain.

7 + 3 + 5