



Name : .....

Roll No. : .....

Invigilator's Signature : .....

**CS/MBA(N)/SEM-( 3 FT & 5 PT )/SM-301/2011-12  
2011**

**DATABASE MANAGEMENT**

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.*

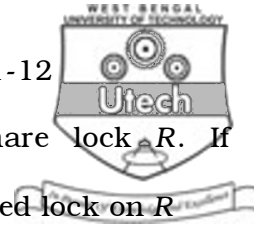
**GROUP – A**

**( Multiple Choice Type Questions )**

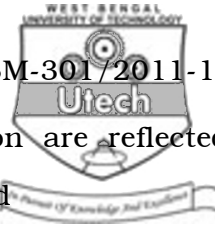
1. Choose the correct alternatives for the following :

10 × 1 = 10

- i) In AN E-R, Y is the dominant entity and X is a subordinate entity. Then which of the following is incorrect ?
- a) operationally, if Y is deleted, so it X
  - b) X existence is dependent on Y
  - c) operationally, if X is deleted, so is Y
  - d) operationally, if X is deleted, Y remains the same.



- ii) Assume transaction  $A$  holds a share lock on  $R$ . If a transaction  $B$  also requests for a shared lock on  $R$
- a) it will result in deadlock situation
  - b) it will immediately be granted
  - c) it will immediately be rejected
  - d) it will be granted as soon it is released by  $A$ .
- iii) Which of the following is correct ?
- a) A SQL query automatically eliminates duplicates
  - b) SQL permits attribute names to be repeated in the same relation
  - c) A SQL query will not work if there are no indexes on the relations
  - d) none of these.
- iv) Data security threats include
- a) invasion of privacy
  - b) hardware protection
  - c) fraudulent manipulation of data
  - d) all of these.



v) Either all operations of the transaction are reflected properly in the database or none is called

- a) durability
- b) consistency
- c) isolation
- d) atomicity.

vi) Consider the join of a relation  $R$  with a relation  $S$ . If  $R$  has  $m$  tuples and  $S$  has  $n$  tuples. Then the maximum and minimum size of the join respectively are

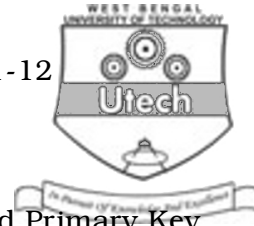
- a)  $m + n$  and 0
- b)  $m + n$  and  $|m - n|$
- c)  $mn$  and 0
- d)  $mn$  and  $m + n$ .

vii) In a multiuser database, if two users wish to update the same record at the same time, they are prevented from doing so by

- a) jamming
- b) password
- c) documentation
- d) record-lock.

viii) If every non-key attribute is fully functionally dependent on the primary key, then the relation will be at least in

- a) 1NF
- b) 2NF
- c) 3NF
- d) 4NF.



- ix) Referential integrity means
- a) relationship with Foreign Key and Primary Key
  - b) relationship with Candidate Key and Primary Key
  - c) relationship with Candidate Key and Foreign Key
  - d) none of these.
- x) Which of the following is not a constraint imposed on a table ?
- a) Primary key
  - b) Not null
  - c) Check
  - d) None of these.

**GROUP – B**

**( Short Answer Type Questions )**

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

2. What are the different data models ? Explain.
3. Write syntax for the following SQL statements :
- a) CREATE
  - b) SELECT
  - c) INSERT
  - d) UPDATE.



4. Explain primary key, super key, foreign key with examples.
5. Describe the three-tier architecture of DBMS.
6. a) What is integrity constraint ?  
b) Briefly explain the key constraint, domain constraint and referential constraint.

**GROUP – C**

**( Long Answer Type Questions )**

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

7. a) Consider the insurance database given below :  
person ( driver\_id, name, address )  
car ( licence, model, year )  
accident ( report\_number, data, location )  
owns ( driver\_id, licence )  
participated ( driver\_id, car, report\_number, damage\_amount )  
Construct the following SQL queries for this relational database.
  - i) Find the total number of people who owned cars that were involved in accidents in 2004
  - ii) Find the number of accidents in which the cars belonging to "Thakre" were involved.
  - iii) Delete the Mazda belonging to "S Khan". 9
- b) How does SQL allow implementation of entity and integrity constraints ? Explain. 6



8. Consider the following relational schema, where the keys are underlined :

Client\_master ( Client\_no, add, city, state, bal\_due, name )

product\_master ( Product\_no, sell\_price, description )

Salesman\_master ( Saleman\_no, salesman\_name, add )

Sale\_order\_details ( Order\_no, Client\_no, Product\_no,  
Order\_date, Sales\_no, Qty\_order, Qty\_ship )

Write SQL statement for following queries :

- a) Find out client who stay in a city whose second letter is a .2
- b) Count the no. of products having price greater than or equal to Rs. 1,500. 2
- c) Find the description and the total qty, sold for each product. 2
- d) Find the products and their quantities for the orders placed by the client no. "C001" & "COO2". 2
- e) Find the customer name, address, city for the client who has placed order no. 19001. 2
- f) Find the names of clients who had placed order worth Rs. 10,000 or more. 2
- g) Create table sale\_details with order\_no. as primary key & product\_no, client\_no as foreign key and insert a set of data in this table. 2 + 1



9. a) Here are two sets of FDs for a relvar  $R \{ A, B, C, D, E \}$ . Are they equivalent ?

i)  $A \twoheadrightarrow B, AB \twoheadrightarrow C, D \twoheadrightarrow AC, D \twoheadrightarrow E$

ii)  $A \twoheadrightarrow BC, D \twoheadrightarrow AE$ .

b) Relvar  $R \{ A, B, C, D, E, F \}$ . satisfies the following FDs :

$AB \twoheadrightarrow C$

$C \twoheadrightarrow A$

$BC \twoheadrightarrow D$

$ACD \twoheadrightarrow B$

$BE \twoheadrightarrow C$

$CE \twoheadrightarrow FA$

$CF \twoheadrightarrow BD$

$D \twoheadrightarrow EF$

Find the closure of set of FDs.

c) Define Armstrong's inference rules.

10. a) Discuss 3NF and BCNF

b) What is canonical cover ?

c) What do you mean by dependency preservation ?

d) How to compute the candidate key ?

11. a) What is transaction life cycle ?

b) Discuss ACID properties.

c) What is serial schedule ?

d) Discuss view and conflict serializability.

