



Name :
Roll No. :
Invigilator's Signature :

**CS / MBA(NEW) / SEM-3(FT) / SM-301 / 2009-10
2009**

DATA BASE 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 of the following : $10 \times 1 = 10$

- i) In the ER-diagram a weak entity set is represented by
 - a) doubly outline rectangle
 - b) rectangle
 - c) oval
 - d) none of these.



ii) A relation has 100 tuples and 6 attributes. The cardinality of the relation is

- a) 6
- b) 100
- c) 600
- d) none of these.

iii) The locks of higher granularity concurrence.

- a) increase
- b) decrease
- c) does not affect
- d) none of these.

iv) ISAM stands for

- a) Indexed Serial Access Method
- b) Independent Storage Access Method
- c) Integrated Sequential Access Method
- d) Indexed Sequential Access Method.

v) A special type of stored procedure that executes when specific events occur to a table is

- a) cursor
- b) trigger
- c) function
- d) none of these.



- vi) The update anomaly refers to a situation where
- a) data cannot be updated due to an existing unique constraint
 - b) data cannot be updated because it does not exist in the database
 - c) a simple update requires updates to multiple rows of data
 - d) data cannot be updated due to an existing referential constraint.
- vii) A referential constraint
- a) must have primary key and foreign key columns that have identical names
 - b) defines a many-to-many relationship between two tables
 - c) ensures that a primary key does not have duplicate values in a table
 - d) ensures that a foreign key value always refers to an existing primary key value in the parent table.
- viii) Concurrence control relates to
- a) multiple users accessing the same system simultaneously
 - b) users accessing multiple databases
 - c) multiprocessing systems
 - d) none of these.



- ix) A race condition occurs when
- a) two concurrent activities interact to cause a processing error
 - b) two users of the DBMS are interacting with different files at the same time
 - c) both (a) and (b)
 - d) none of these.
- x) Which phase is not part of a two phase locking protocol ?
- a) Growing phase
 - b) Shrinking phase
 - c) Stabilization phase
 - d) None of these.

GROUP – B

(Short Answer Type Questions)

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

2. What are the advantages of DBMS over file management system ? Explain briefly.
3. Explain the 'two phase locking' protocol.
4. a) What is integrity constraint ?
b) Briefly explain the key constraint, domain constraint and referential constraint.



5. Consider the following “sailors” and “reserves” relations :
- R (sid, bid, day)
- S (sid, sname, rating, age)
- Formulate the following queries using relational algebra :
- Find names of sailors who have reserved boat #XXX.
 - Find names and ages of sailors who have reserved a boat.
6. Explain the 3-schema architecture of a database. What is data independence ?

GROUP – C

(Long Answer Type Questions)

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

7. a) What do you mean by ‘ACID properties of transaction’ ? 7
- b) What are the different types of failure of data in a database system ? 4
- c) Differentiate between volatile and non-volatile storage media. 4
8. a) What are transaction states ? 5
- b) What is a trigger ? How many types of triggers are there ? 3 + 4
- c) What is view ? Write the SQL command to create a view. 3



9. a) Consider the insurance database given below :
- person (driver_id, name, address)
- car (licence, model, year)
- accident (report_number, date, 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. 9
 - ii) Find the number of accidents in which the cars belonging to "Thakre" were involved. 9
 - iii) Delete the Mazda belonging to "S Khan". 9
- b) How does SQL allow implementation of entity and integrity constraints ? Explain. 6
10. a) What is functional dependency ? 2
- b) What are Armstrong's axioms ? 8
- c) Here is a set of FDs for a relation $R \{ A, B, C, D, E, F, G \}$:
- $A \twoheadrightarrow B$
- $BC \twoheadrightarrow DE$
- $AEF \twoheadrightarrow G$
- Prove that $ACF \twoheadrightarrow DG$ is implied by this set. 5



11. Explain the following relational algebra operations using suitable example :

Selection, Projection, Set union, Set difference, Set intersection, Cartesian product, Natural join, Theta join, Set division.

