	<u>Uffech</u>
Name :	4
Roll No. :	A Parague (V Exercisely 2nd Exercise
Inviailator's Sianature :	

#### 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.

110315 [ Turn over

A relation has 100 tuples and 6 attributes ii) cardinality of the relation is a) 6 b) 100 none of these. c) 600 d) The locks of higher granularity ...... concurrence. iii) a) increase b) decrease none of these. does not affect d) c) ISAM stands for iv) **Indexed Serial Access Method** a) **Independent Storage Access Method** b) **Integrated Sequential Access Method** c) Indexed Sequential Access Method. d) A special type of stored procedure that executes when v) specific events occur to a table is b) a) cursor trigger none of these. c) function d)

- 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**

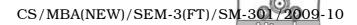
### (Short Answer Type Questions)

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.

110315



5. Consider the following "sailors" and "reserves" relations

R (sid, bid, day)

S ( sid, sname, rating, age )

Formulate the following queries using relational algebra:

- a) Find names of sailors who have reserved boat #XXX.
- b) 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?
- c) Differentiate between volatile and non-volatile storage media.
- 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

110315

5

[ Turn over

9. Consider the insurance database given below a) person (driver id, name, adress) 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. Find the total number of people who owned cars i) that were involved in accidents in 2004. Find the number of accidents in which the cars ii) belonging to "Thakre" were involved. Delete the Mazda belonging to "S Khan". iii) 9 How does SQL allow implementation of entity and b) integrity constraints? Explain. 6 What is functional dependency? 2 10. a) What are Armstrong's axioms? 8 b) Here is a set of FDs for a relation  $R \{A, B, C, D, E, F, G\}$ : c)  $A \varnothing B$ BC Ø DE  $AEF \varnothing G$ Prove that ACF  $\varnothing$  DG is implied by this set. 5

6

110315

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.

110315 7 [ Turn over