

(Time: 2½ Hours)

[Total Marks: 75]

- N. B.: (1) **All** questions are **compulsory**.
 (2) Make **suitable assumptions** wherever necessary and **state the assumptions** made.
 (3) Answers to the **same question** must be **written together**.
 (4) Numbers to the **right** indicate **marks**.
 (5) Draw **neat labeled diagrams** wherever **necessary**.
 (6) Use of **Non-programmable** calculators is **allowed**.

1. Attempt **any three** of the following: 15

- What are the disadvantages of file processing system?
- List and explain different levels of abstraction.
- Write importance of data model.
- What are the basic building blocks of data model? Explain with example.
- What is mapping cardinality? Explain with suitable example.
- List and explain different types of attributes in ER model.

2. Attempt **any three** of the following: 15

- Write a short note on Boyce-Codd Normal Form (BCNF).
- Define:
 - Super key
 - Candidate key
 - Primary key
 - Foreign key
 Give example of each.
- With suitable example explain the select and project operation of relational algebra.
- Explain the aggregate operation of relational algebra.
- Write the formal definition of tuple relational calculus. Explain.
- Write a short note on domain relational calculus.

3. Attempt **any three** of the following: 15

- Explain the use of integrity constraints.
- What is view? Explain how to create a view.
- Write a short note on updatable view.
- Consider the schema where the primary keys are underlined.
 person (driver_id, name, address)
 car (license, model, year)
 accident (report number, date, location)
 owns (driver id, license)
 participated (report number, license, driver id, damage amount)
 Construct the following SQL queries for this relational database.
 - Find the total number of people who owned cars that were involved in accidents in 2009.
 - Add a new accident to the database; assume any values for required attributes.
 - Delete the Mazda belonging to "John Smith".
 - Find the number of accidents in which the cars belonging to "John Smith" were involved. 5. Update the damage amount for the car with the license number "AABB2000" in the accident with report number "AR2197" to \$3000.
- Write SQL DDL corresponding to the schema in Q.3 d. Make any reasonable assumptions about data types, and be sure to declare primary and foreign keys.
- What is trigger? Why is it required? Explain with example.

[TURN OVER]

Q. P. Code: 20942

4. Attempt **any three** of the following:

- Write the ACID properties.
- List and explain various states of transaction.
- Write a note on conflict serializability.
- Explain the Two-Phase locking protocol.
- How deadlock is prevented?
- Explain the timestamp ordering protocol.

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5. Attempt **any three** of the following:

- Explain with example the for loop in PL/SQL.
- What is cursor? What are different types of cursors? List and explain different cursor attributes.
- Write a function that is used to display factorial of a number entered by user. Also write a PL/SQL block that calls this function.
- Explain how exceptions are handled in PL/SQL. Give suitable example.
- Create a package containing definition of a procedure, a constant and a variable. Write a PL/SQL program to use the same.
- Explain how triggers are created. Give suitable example.

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