Time: 3 Hours **Marks: 80**

Note : 1. Question one is compulsory.
2. Answer any three from the remaining.

Q. 1 a List all functional dependencies satisfied by the relation **5**

A	B	C
A1	B1	C1
A1	B1	C2
A2	B1	C1
A2	B1	C3

b Write a stored Procedure to add two numbers **5**

c Define Terms : Primary Key and Foreign Key **5**

d Explain Generalization and Specialization. **5**

Q. 2 a Explain ACID properties in detail with example **10**

b Discuss the need of Normalization with example **10**

Q. 3 a Explain the advantages of database approach over traditional file processing and differentiate between databases and file system. **10**

b Explain following relational algebra operations with proper examples. **10**

I. Project
II. Natural Join
III. Set Interaction
IV. Select

Q. 4 a Consider Insurance Database given below and answer the following queries in SQL. **10**

Person (driver_id, name, address)
Car (license_no, model, year)
Accident (report_no, accident_date, location)
Owns (driver_id, license_no)
Participated (driver_id, license_no, report_no, damage_amount)

1) Find Total number of people who owned car those are involved in accidents in 2018.
2) Add new accident record in to database.
3) Delete 'honda city' belonging to 'Kevin Peter'
4) Find the number of accidents in which car belonging to ' Mark dales' were involved.

b Construct an ER diagram for Car Insurance Company. **10**

Q. 5 a Draw and Explain Database System Architecture **10**

b Explain steps in Query Processing and Optimization **10**

Q. 6 Write a Short Note on: **5**

a Shadow Paging Technique

b Database Failure Classification **5**

c Views in SQL **5**

d Data independence in database system **5**

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