Instruction: Give examples wherever necessary.

1. Define the following terms with example (any five) 10
   (a) Dense secondary index
   (b) Schema and Instance
   (c) Data Independence
   (d) Domain and Attribute
   (e) DDL, DML, DCL, TCL
   (f) Functional Dependency.

OR

1. (a) Write down the advantages and disadvantages of DBMS. 5
   (b) Write a short note on DBA responsibilities. 5

2. (a) Explain the following keys with example: (any five) 5
   (i) Primary key
   (ii) Foreign key
   (iii) Candidate key
   (iv) Alternate key
   (v) Super key
   (vi) Secondary key.

   (b) Explain three level architecture of DBMS. 5

OR

2. (a) Explain types of data models with example. 10
3 Write SQL statements for the following: (any five)

Donner (d-id, name, blood-group, city)
Collection (center-id, collection-date, bag-no, d-id)
Issue (bag-no, issue-date, hospital-id)
hospital (hospital-id, name, city)

(i) List the donors with details who donated on 1/1/1997
(ii) List hospitals with details, which have not taken blood so far.
(iii) List the hospitals blood group wise
(iv) List the details of donors who have donated blood more than 3 times
(v) List the current stock of blood bags
(vi) List the hospitals of Bombay or Ahmedabad.

OR

3 (a) Write a short note on views in SQL.
(b) What is PL/SQL? Explain the block structure of PL/SQL block.

4 (a) Explain non-redundant cover with example.
(b) Explain following algorithms:
   (i) To compute closure of attribute X
   (ii) Membership algorithm

   (Test if \( F \models X \rightarrow Y \))

OR

4 What is normalization? Explain First, Second and Third Boyce-Codd normal forms with Insertion, Deletion and Updation Anomalies.

5 (a) Explain briefly failure Anticipation and Recovery.
(b) What is DDBMS? Give its advantages.

OR

5 (a) What is transaction? Explain the properties of a transaction.
(b) What is DDBMS? Give its disadvantages.