Q1. Differentiate between Logical and Physical Data Independence.

2
CO2

Q2. Give any four responsibility of database administrator.

2
CO2

Q3. A marketing company maintains information about salespersons, Areas and Products. Salespersons have a unique identification number, name, designation and area allocated to each one. Areas are divided with a number and names. Products have their number, name, cost, discount, and the areas where these product need to be marketized. Sales persons can sale any product in their areas, and maintains a monthly statement which shows the number of products sold, along with their cost, discount and date of delivery. On the basis of above statements design an ER diagram indicating attributes, keys and cardinality ratios.

8
CO2

Q4. Consider the following relations :
AIRBUS (Name, Start_Station, Dest_Station, ANumber)
TICKET (PNRNO, Start_Station, Dest_Station, Fare)
PASSENGER (Name, Address, PNRNO. ANumber)

10
CO1,
CO4

(a) Write Relational Algebra Queries for the following:
  1. Retrieve the name of Airbus which are running between Start_Station 'Delhi' to the Dest_Station 'Mumbai' of the Airbus.
  2. Retrieve the names of all the passengers who have paid more than Rs. 50,000/- as fare and have travelled through AIRBUS Name 'A101'
  3. Find the average fare paid by passenger with the name "Ankit".

(b) Apply Query Optimization on Query 2 above.

Q5. Consider the relation R1 (P,Q,R,S) with functional dependencies:
F = {P→QR, Q→R, R→S, PQ→R} Find the Canonical/Minimal cover of F.

4
CO2

Q6. Explain different components of DBMS in detail using a suitable diagram.

4
CO2