Time: 3 hours **Marks: 80**

N.B.: 1. Question No.1 is compulsory.
2. Answer any three out of remaining questions.
3. Assume suitable data if necessary.
4. Figures to the right indicate full marks.

Q1. Attempt All questions 20M
(a) Explain the need of normalization in database.
(b) Discuss select and where clause in SQL.
(c) Discuss various ER notations.
(d) Explain the role of JDBC in database applications.

Q2.
(a) Discuss normalization process to improve the database design. 10M
(b) Explain relational algebra with suitable examples in detail. 10M

Q3
(a) Draw EER diagram for Train Ticket Booking Information System 10M
(b) Draw and explain notations in EER diagram 10M

Q4.
(a) Explain how various DDL and DML commands used in SQL with example 10M
(b) Write SQL Syntax for(Assume data wherever required) 10M
(i) Create flight table(flight_id,name,source_station,destination_station,duration(in hours),cost)
(ii) Create passenger table (pid,name,phone_number,flight_id) with flight_id as foreign key.
(iii) Arrange flights in descending order of cost.
(iv) Find flight name which passenger no 1 had board.
(v) Find destination_station for flight no E123.

Q5
(a) Discuss functional dependencies in detail 10M
(b) Write relational algebra query for(Assume data wherever needed)
(i) Find names of students who live in city 'Mumbai from student table 3M
(ii) Find department of student whose roll_no is 2 from info table 3M
(iii) Find name of students whose marks are greater than 22 4M

Q6.write short note on 20M
(a) Procedures in SQL
(b) Order by and Group by in SQL
(c) Integrity constraints in SQL
(a) Discuss functional dependencies in detail.

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