Q.P. Code : **3549**

a2zSubjects.com   (3 Hours)   [Total Marks : 80

N.B. : (1) Question No.1 is **compulsory**.
(2) Attempt **Any Three** from remaining **Five Questions**.

1. (a) Draw E-R diagram for online Ticket Railway Reservation System. Convert E-R diagram into tables. **10**

   (b) Explain following Relational algebra operations with examples. **10**
   (i) Set difference   (ii) Generalized Projection
   (iii) Natural join   (iv) Rename

2. (a) What is recoverable schedule? Why recoverability of schedule is desirable? Explain recovery with concurrent transaction. **10**

   (b) Explain following terms with suitable example **10**
   (i) Primary key (ii) Candidate key (iii) Foreign key (iv) Super key

3. (a) What is transaction? Discuss ACID properties of transaction? **10**
   (b) Define Normalization? Explain 1NF, 2NF, 3NF and BCNF **10**

4. (a) For the following given database, write SQL queries:- **10**
   Person (driver_id#, name, address)
   Car (license, model, year)
   Accident (reporcno, date, location)   a2zSubjects.com
   Owns (driver_id#, license)
   Participated (drivercid, car, report_number, damage_amount)

   (i) Find the total number of people who owned cars that were involved in accident 2004
   (ii) Find the number of accidents in which the cars belonging to "HT" were involved
   (iii) Update the damage amount for car with license number "Mum2011" in the accident with report number "AR120" to Rs. 4000

   (b) Describe overall architecture of DBMS with diagram. **10**

5. (a) Explain various types of constraints with an example. **10**
   (b) Explain sort-merge join algorithm in query processing. **10**

6. (a) Write short notes on any four **20**
   (i) Generalization and Aggregation
   (ii) Total Participation and Partial participation
   (iii) Division Operator
   (iv) Shadow page recovery
   (v) Cost Based query optimization   a2zSubjects.com

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JP-Con. 11748-15.