



Primary keys are underlined. Obtain solution for the following queries using SQL.

- i) Get the part number for parts such that no other part has higher weight value. 2
  - ii) Get project\_Name for project supplied by. 2
  - iii) Get the supplier no. for supplier who supply project J1 with red Part. 2
  - iv) Get part\_number (P#) for part supplied to any project in "London". 2
  - v) Get name of suppliers with letter starting as 'A'. 2
7. a) Define query optimization. What are the various measures to evaluates the cost of query. 7
- b) Give block nested-loop join algorithm for computing the join relations and analyze its cost for the best and worst case. 6

**OR**

8. a) Explain various steps in Query processing with the help of neat sketch. 7
- b) Write short note on Query evaluation. 6
9. a) Explain the states of a transaction with the help of state transition diagram. 6
- b) What is conflict serializability? Explain different form of schedule equivalence i.e. conflict serializability. 7

**OR**

10. a) Explain lock based protocol for concurrency control in database transaction. 7
- b) What is two phase locking protocol? How does it guarantee serializability? 6
11. a) Explain following with respect to crash recovery.
- 1) Shadow paging. 4
  - 2) Check point. 3
  - 3) Log based recover. 3
  - 4) Buffer Management. 4

**OR**

12. a) Explain ARIES algorithm for Recovery. 7
- b) What are various types of failures that occur in a system and also explain recovery method used. 7

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