



- Notes :
1. All questions carry marks as indicated.
  2. Solve Question 1 OR Questions No. 2.
  3. Solve Question 3 OR Questions No. 4.
  4. Solve Question 5 OR Questions No. 6.
  5. Solve Question 7 OR Questions No. 8.
  6. Solve Question 9 OR Questions No. 10.
  7. Solve Question 11 OR Questions No. 12.

1. a) Explain IMS in brief. Also write its Advantages and disadvantages. 7
- b) Define DBMS. Draw three level architecture of DBMS and describe basic components of DBMS. 7

**OR**

2. a) What is DBA? Explain different responsibilities handled by DBA. 6
- b) Explain hierarchical, network and relational model in brief. 8
3. a) Construct an E-R model of the database of Hospital with respect to the following. 9
  - i) Relational model.
  - ii) Network model.
  - iii) Hierarchical model.
- b) Explain different type of attributes in E-R diagram. 4

**OR**

4. a) Compute  $(AB)^+$  and  $F^+$  for  $R(A,B,C,D,E)$  5  
 $F = \{A \rightarrow BC$   
 $CD \rightarrow E$   
 $B \rightarrow D$   
 $E \rightarrow A\}$
- b) What is normalization? Explain with suitable example 1NF, 2NF, 3NF and BCNF. 8
5. a) Differentiate between Data Definition language and Data Manipulation language. 6
- b) Write a note on Hash file organization. 8

**OR**

6. a) Write short note on PL/SQL and explain its advantages. **5**
- b) Write the difference between:
- i) Static and dynamic Hashing. **3**
  - ii) Sparce and Dense Indexes. **3**
  - iii) B – tree and B + tree **3**
7. a) What do you mean by query processing? What are different joint strategies in Query processing. **7**
- b) Explain materialized view in short. **6**

**OR**

8. a) Write a note on
- i) Cost estimation. **4**
  - ii) Query optimization. **5**
  - iii) Evaluation plans. **4**
9. Write the important properties of transaction. Also explain transaction states. **13**

**OR**

10. a) Discuss following terms with example.
- i) Deadlocks. **2**
  - ii) Conflict Serializability. **2**
  - iii) Compatibility function on lock mode. **2**
- b) Explain lock Based protocols. **7**
11. a) What are the types of failure? **6**
- b) Explain the purpose of checkpoint mechanism. How does the checkpoints affect system performance when no failure occurs. **7**

**OR**

12. a) What is metadata? How is it used to recover the data in case if transaction fails? **6**
- b) Write a note on Atomicity. How is it used in transaction processing system. **7**

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