

2017

Full Marks - 40

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *all* questions

1. a) What do you mean by Data models ? Compare Hierarchical, network and relational models. 6
- b) What is Transaction in database concept ? Explain the ACID properties of transaction. 4

OR

- c) What is ER diagram ? Describe the different methods for reduction of ER diagram to Relational schemes with suitable examples. 6
- d) Consider the student schema as :

Student(Sname, RollNo, Department, Percentage_Mark)

Write the SQL and relational algebra expression for the following : 4

- i) Find the name and roll no. of the students who have secured more than 60% in exam.
- ii) Find the name of students who have topped in each department.

[2]

2. a) What do you mean by integrity constraints ?
How referential integrity constraint is maintained in database system ? 5
- b) Differentiate multi-valued and join dependencies with suitable examples. 5

OR

- c) What is the need of normalization ? Explain 2NF and 3 NF with suitable examples. 6
- d) Give Relation Schema R(ABCDEG) and set of functional dependencies $\{AD \rightarrow E, B \rightarrow D, E \rightarrow G\}$. R is decomposed into R1 (AB), R2(BC), R3(ABDE), R4(EG). Test and mention whether the given decomposition is a lossless decomposition or not. 4
3. a) What is object oriented database system ? Explain the pros and cons of object oriented data model over relational data model. 5
- b) Why Complex types are necessary for object oriented data model ? Explain with examples. 5

OR

[3]

- c) Explain the concept of nested relations in database design. Compare object oriented and object relational database. 6
- d) What are the different complex types used in SQL ? Write an SQL query for creating values for complex types. 4

OR

4. a) Write unique features of Client-Server database system. Compare it with Centralized database system. 6
- b) Explain the key features of distributed database system briefly. 4
- c) Explain the concept of Parallel Database System. What are the advantages of parallel DBMS ? 5
- d) What is Concurrency Control ? Explain the different concurrency control techniques. 5

L-622-0-6

