

## ALCCS

Time: 3 Hours

**DECEMBER 2015**

Max. Marks: 100

**PLEASE WRITE YOUR ROLL NO. AT THE SPACE PROVIDED ON EACH PAGE IMMEDIATELY AFTER RECEIVING THE QUESTION PAPER.**

**NOTE:**

- **Question 1 is compulsory and carries 28 marks. Answer any FOUR questions from the rest. Marks are indicated against each question.**
- **Parts of a question should be answered at the same place.**

- Q.1**
- Explain the role of concurrency control software in DBMS with an example.
  - Define participation constraints with respect to entity in DBMS.
  - Define Tuple, Attribute, Relation, and Domain in the context of relational model.
  - Write a short note on Structured Query Language.
  - Explain the three commands used to modify the database.
  - Explain the two levels at which the “goodness” of relation schemas can be measured.
  - Write a short note on Boyce-Codd normal form (BCNF). (7×4)
- Q.2**
- Define database management system. What are the functions performed by a typical DBMS? (6)
  - Explain the three-schema architecture of database systems. (6)
  - Define Data manipulation Language (DML). Explain the different types of DMLs. (6)
- Q.3**
- Define Entity Types, Entity Sets, and Value Sets. (6)
  - Explain weak entity and aggregation in ER Model. (6)
  - Explain conceptual database design. Give an illustration. (6)
- Q.4**
- Define candidate Key and primary Key. (6)
  - Explain Tuple Relational calculus. (6)
  - Explain concurrency control techniques used in DBMS. (6)
- Q.5**
- Write a SQL query to find the salaries of all employees of the ‘Finance’ department, as well as the maximum salary, the minimum salary, and the average salary in this department. (9)
  - How general constraints can be specified by the users in SQL? Explain your answer with an example. (9)
- Q.6**
- Explain functional dependency. Mention any three inference rules used in functional dependencies. (3+3)
  - Explain 2NF, 3NF and 4NF. Give an example for each. (3x2)
  - Explain the possible reasons for a transaction to fail in the middle of execution in DBMS. (6)
- Q.7**
- Explain heuristics in Query Optimization. (6)
  - Explain the components of distributed database. (6)
  - Explain Web database. (6)