

Database Systems**Time: 2.5 Hrs****Total Marks: 75****Please check whether you have got the right question paper.****N.B: 1.All question are compulsory.****2.Figures to the right indicate full marks.****3.Students answering in the regional language should refer in case of doubt to the main text of the paper in English.****Q1. Answer the Following: (Any 4)****(20 marks)**

- Write advantages of DBMS over file system.
- Define data independence and explain its types.
- What is Data model in DBMS? Explain its types.
- List and explain different types of attributes in ER model.
- Explain the relational constraints in Relational Data model.
- Draw an ER diagram and reduce it to relational database model for a university database for scheduling of classrooms for final exams. This database could be modelled using entities as exam (course_name, section_number, room_number, time); course (name, department, c_number), room (r_number, capacity, building). Entity section is dependent on course.

Q2. Answer the Following: (Any 4)**(20 marks)**

- Write a short note on Boyce-Codd Normal Form (BCNF).
- Define:
 - Super key
 - Candidate key
 - Primary key
 - Foreign key.Give example of each.
- With suitable example, explain the select and project operation of relational algebra.
- Explain the aggregate operations.
- Explain SET operators in relational algebra with example.
- Consider the schema where primary keys are underlined:
Employee (Eid, name, address, hire_date, birth_date)
Department (dept_id, name, year_of_establishment)
Emp_dept (E_id, dept_id, from_date, to_date)
Salaries (E_id, salary, month, year)
Construct the following SQL queries for this relational database:
 - List all the employees of IT department.
 - Delete employee whose name is 'ABC'.
 - List all departments in which at least one employee gets salary > 50000.
 - List all the departments that established in the year 2000.
 - Update the salary of employee to 20000 whose id is 'E001' for April 2018.

Q3. Answer the Following: (Any 4)**(20 marks)**

- Write a short note on views.
- Write short note on String function.
- Explain any four Date functions with example.
- Explain any four Math functions with example.
- What are the roles and responsibilities of DBA?
- Explain different outer join operations with example.

Q4. Answer the Following: (Any 3)

(15 marks)

- a) Write a note on Aggregation and Generalization.
- b) Explain Natural join and Set difference relational algebra operators with example.
- c) What is nested sub query? Explain ANY/ALL clause with example.
- d) What is data abstraction?
- e) Explain group by clause and having clause with example.
- f) Write a note on DCL.