National Institute of Technology, Delhi

Name of the Examination: Mid-Term (B. Tech)

Branch   **: CSE**   **Semester: III**

Title of the Course: Database Management Systems   **Course Code: CSB 202**

Time: 2 Hours   **Maximum Marks: 25**

Ques1. [1+1+1+2 Marks]

(i) What is the main difference between Primary key and Unique Key?

(ii) What are various components of Database Manager?

(iii) Which abstraction level helps the developer to develop a database application without looking into its internal structure?

(iv) Elaborate through diagram the system structure of DBMS.

Ques2. [5 Marks] Consider a university database for the scheduling of classrooms for final exams. This database could be modeled as the single entity set exam, with attributes course-name, section-number, room-number, and time. Alternatively, one or more additional entity sets could be defined, along with relationship sets to replace some of the attributes of the exam entity set, as
• Course with attributes name, department, and c-number
• Section with attributes s-number and enrollment, and dependent as a weak entity set on course
• Room with attributes r-number, capacity, and building
  Show an E-R diagram illustrating the use of all three additional entity sets listed.

Ques3. **Consider the following relations containing airline flight information:**   [15 Marks]
Flights (flno, from, to, distance, departs, arrives)
Aircraft (aid, aname, cruisingrange)
Certified (eid, aid)
Employees (eid, ename, salary)

Create the above schema consisting of tables with appropriate constraints.
Write a SQL statement for following queries (Any seven).
1. Display the aids of all aircraft that can be used on non-stop flights from Bonn to Madras.
2. Identify the flights that can be piloted by every pilot whose salary is more than $100,000.
3. Return the names of pilots who can operate planes with a range greater than 3,000 miles but are not certified on any Boeing aircraft.
4. Find the eids of employees who make the second highest salary.
5. Return the eids of employees who are certified for the largest number of aircraft.
6. Change all the distance to 400 for those flights that fly from Delhi to Jaipur.
7. Retrieve a list of employees and the flights they are certified on, ordered by distance.
8. For all aircraft with cruisingrange over 1000 miles, find the name of the aircraft and the average salary of all pilots certified for this aircraft.