BCSE-III

DBMS Class Test

Full Marks: 30

Time: 1 hr. 30 mins. (incldg. Question download and answerscript upload)

- **Arrange the pages in sequence and form a single pdf.**
- **File name will be last two digits of your class roll followed by your first name. For Lateral entry students filename must start with L and for readmitted students filename must start with R**
- **On the top of the first page write your Class Roll Number and Name**
- **Send the answer script at: sksjuexam@gmail.com with subject DBMS Test**
- **In case of any query give me a call at 9433526300**

Attempt all questions

CO1: Understand the fundamental concepts of DBMS and relational model [15 marks]

1. a) Mention the disadvantages of NULL value and data redundancy. 3

   b) Assume, each student has unique roll number. Roll number consists of year of admission, dept code and a 3 digit serial number. A student can have one or more phone numbers. Consider the schema STUDENT(ROLL, NAME, PHONE_NO). Explain, whether it follows relational model or not. 2.5

   c) Consider the relations R1(A1, A2, A3, A4) and R2(B1, B2, A2, A3). Express R1*R2 with basic operations of relational algebra. 2

   d) An institute has five departments and each department has unique DEPT_CODE. STUDENT (ROLL, NAME, DEPT_CODE) stores the data of all the students. Explain the output of π_{DEPT_CODE}(STUDENT). 1.5

   e) Specify the impact of referential integrity on DML operation with referencing relation. 2

   f) Consider the relations : **PROJECT**(PROJ_ID, PROJ_NAME, START_DT, END_DT), **EMPLOYEE**(EMP_CODE, EMP_NAME) and **WORKS_IN**(EMP_CODE, PROJ_ID, ROLE_IN_PROJECT).

   i) Write down the relational calculus expression to find out the name of the employees who work in the project named as 'ABC'.

   ii) Write down the relational algebra expression to find out the name of the employees who work in all the projects. 2+2

CO2: Represent the database using Entity-Relation Model and design the database [10 marks]

2. a) Consider two entity types A(a1, a2, a3) and B(b1,b2,b3). There exists one to one relation R between them. Suppose to capture whole scenario a table is designed as ABR(a1, a2, a3, b1, b2, b3) where a1 is a candidate key and b1 is another candidate key. Discuss the pros and cons of the design. 2

   b) Explain, how you will design the relation for a weak entity type. 2

   c) Consider A is a generalized entity type that totally participates in the relation with the specialized entity types B, C and D. Explain how you will design the tables. 3

   d) A system deals with customer, order and bill. customer_id, order_id and bill_id are the primary key of customer, order and bill respectively. A customer may place one or more orders. A bill is always associated with an order. An order always generates a bill. Draw the ERD and optimally design the database (necessary tables). 3

CO4: Interact with database using SQL, PL/SQL, Trigger [5 marks]

3. Write down the SQL statements to create the tables that you have designed in Q.2)d). 5