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Roll No. .....

TBC–302/TBI–301

B. C. A./B. SC. (IT)

(THIRD SEMESTER)

END SEMESTER

EXAMINATION, Jan., 2023

DATABASE MANAGEMENT SYSTEM

Time : Three Hours

Maximum Marks : 100

Note : (i) All questions are compulsory.

(ii) Answer any *two* sub-questions among (a), (b) and (c) in each main question.

(iii) Total marks in each main question are **twenty**.

(iv) Each sub-question carries 10 marks.

P. T. O.

1. (a) Define data modelling ? What is its role in database design ? Explain the types of modelling. (CO1)

   (b) Write the importance of ER diagram in database and explain all ERD symbols. Draw ER diagram for the following scenario :

   university needs to maintain the information about its affiliated colleges and courses offered in each college as detail given below. College : college_code, college_name, address (consisting of street, area and city) Courses offered : course_code, course_name, course_credit. Student : student's number, birth_date, gender, address, phone number, courses_taken. Draw E-R diagram for the above situation and identify the possible relationship between entities. (CO1)

   (c) Explain the 3-layer architecture of DBMS along with the main components. Also differentiate between Entity Integrity and Referential Integrity ? (CO1)

2. (a) Define the term constraint. Explain the following constraint with SQL Syntax : (CO2)

   (i) Primary key

   (ii) Foreign key

   (iii) Check

   (iv) Unique.

   (v) Default

   (b) Explain mapping cardinalities. Also explain relational algebra, with proper example. (CO2)

   (c) Write short notes on the following : (CO2)

   (i) Domain

   (ii) Schema

   (iii) Tuple

   (iv) Super key

   (v) Composite key

3. (a) Define SQL. Explain various types of SQL Commands. Write SQL for the following : (CO3)

   (i) Creating a "Student" table with Roll no, Name & Address fields.

   (ii) Insert 4 Records in "Student" table.

   (iii) Add a Column "ADDRESS" in "Student" table.

   (iv) Change all ADDRESS OF ROLLNO 3.

   (v) Make Rollo Primary Key using Table level syntax

   (b) Explain all the aggregate function available in SQL. Also explain the role of view in SQL with an example. (CO3)

   (c) Describe the need of join. Explain all the types of joins with proper SQL example. (CO3)

4. (a) What is the need of normalization ? How many types of normalization are there ? Explain with their properties. (CO4)

   (b) Explain Functional Dependency, properties of FD and type of FD with an example. (CO4)

   (c) What is meant by redundancy and why do we want to avoid it when creating a database ? Also explain the process for normalizing a database from 1NF to 2NF. (CO4)

5. (a) Describe the term transaction and data base failure. Explain all types of failure. (CO5)

   (b) Explain concurrency control in DBMS. Explain any concurrency related problem with example. (CO5)

   (c) Differentiate between serial and non-serial schedule with suitable example. Explain any concurrency related problem with an example. (CO5)