

Question Paper

Exam Date & Time: 02-Feb-2023 (09:30 AM - 12:30 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION
INTERNATIONAL CENTRE FOR APPLIED SCIENCES
END SEMESTER THEORY EXAMINATION - DECEMBER 2022
III SEMESTER B.Sc. (Applied Sciences) in Engg.
Database Management Systems [ICS 231]

Marks: 50

Duration: 180 mins.

Answer all the questions.

Missing data may be suitable assumed.

- 1) List and explain the major advantages of database system. (3)
 - A)
 - B) List and explain any four different types of databases. (4)
 - C) Outline logical and physical data independence. (3)
- 2) Explain the following database terms with an example. (3)
 - A)
 - i) Primary key
 - ii) Foreign key
 - iii) Super key
 - B) Construct an E-R diagram for a car insurance company whose customers own one or more cars each. Each car has associated with it zero to any number of recorded accidents. Each insurance policy covers one or more cars and has one or more premium payments associated with it. Each payment is for a particular period of time, and has an associated due date, and the date when the payment was received. Assume relevant attributes for each entity. (4)
 - C) Discuss the foreign key constraint violation with examples for insert and delete operation. (3)
- 3) Explain the Boyce-Codd Normal form with an example. (3)
 - A)
 - B) Define normalization. Consider the universal relation $R = \{A, B, C, D, E, F, G, H, I, J\}$ and the set of functional dependencies $G = \{\{A, B\} \rightarrow \{C\}, \{B, D\} \rightarrow \{E, F\}, \{A, D\} \rightarrow \{G, H\}, \{A\} \rightarrow \{I\}, \{H\} \rightarrow \{J\}\}$. Find the key of the relation. Change R into **2NF** and then **3NF** relations. Show all the steps. (4)
 - C) Create the Database tables for the following ER diagram. (3)