

# Question Paper

Exam Date & Time: 06-Jul-2022 (09:30 AM - 12:30 PM)



**MANIPAL ACADEMY OF HIGHER EDUCATION**  
**INTERNATIONAL CENTRE FOR APPLIED SCIENCES**  
**IV SEMESTER B.Sc. (Applied Sciences) in Engg.**  
**END SEMESTER THEORY EXAMINATION - MAY/ JUNE 2022**  
**DATABASE MANAGEMENT SYSTEMS [ICS 242 - S2]**

**Marks: 50**

**Duration: 180 mins.**

**Answer all the questions.**

**Missing data may be suitably assumed**

**Design data handbook is permitted**

- 1) Write a note on the different components and data structures used in storage manager. (3)
  - A)
  - B) Describe with a neat diagram the three levels of data abstraction. (3)
  - C) Define any four basic operators of relational algebra with an example for each (4)
- 2) Given the following relations (3)
  - A) Vehicle (Reg\_no, make, colour)  
Person(eno, name, address)  
Owner(eno, reg\_no)  
Write expressions in the relational algebra to answer the following queries:-
    - (i) List the reg\_no of vehicles owned by John
    - (ii) List the names of persons who own maruti cars.
    - (iii) List the make and reg\_no of the red coloured vehicle.
  - B) Explain GROUP BY clause in SQL (3)
  - C) Describe dense and sparse indexes. Also, list the advantages and disadvantages of the two with respect to insertion and deletion. (4)
- 3) What is a view in SQL? When can views be updated? (3)
  - A)
  - B) Explain aggregation in ER Diagram with a neat example (3)
  - C) A database is to be constructed to keep track of the teams and games of a sport league. A team has a number of players, not all of whom participate (4)