USN | | | | | | | | | | **15CS53**

Fifth Semester B.E. Degree Examination, Jan./Feb. 2023
Database Management System

Time: 3 hrs.   Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1   a. Explain the component modules of DBMS and their interactions with a neat diagram.
                                                                    (08 Marks)
     b. Write an ER diagram of hospital management system. Assume your own entities, attributes
         and relations. Mention the specifications also.   **(08 Marks)**

OR

2   a. Illustrate "three schema architecture" with a neat diagram. **(06 Marks)**
     b. Define the following terms with example :
         (i)   Data model
         (ii)   Complex attribute.
         (iii) Recursive relationship
         (iv)   Meta data.
         (v)   Composite attribute.   **(10 Marks)**

Module-2

3   a. Explain any four relational algebra operations with examples. **(08 Marks)**
     b. Write the relational algebra queries to perform the following on "Company database".
         (i)   Retrieve the name and address of all employees who work for "Research"
                department.
         (ii)   Retrieve the names of employees, who have no dependants. **(08 Marks)**

OR

4   a. Explain the different constraints that can be applied during table creation in SQL, with an
         example.   **(08 Marks)**
     b. Design the SQL queries for the following database schema :
         Works(Pname, Cname, Salary)
         Lives(Pname, Street, City)
         Located_in(Cname, Lcity)
         Manager(Pname, Mgrname)
         (i)   Find the names of all persons who lives in the city "Bengaluru".
         (ii)   Find the names of all persons who lives and work in same city.
         (iii) Find the sum of salaries of persons working in "wipro" company.
         (iv)   Find the names of all persons who work in "Infosys" and salary is between Rs.50,000
                and Rs.90,000.   **(08 Marks)**

Module-3

5   a. Define view. Illustrate creation of view with an example.   **(04 Marks)**
     b. Explain stored procedure and its advantages. Give an example for creation of stored
         procedure.   **(06 Marks)**
     c. Explain the classification of four types of JDBC drivers.   **(06 Marks)**

OR

6 a. Explain a standard three-tier architecture, with a neat sketch. **(08 Marks)**
  b. Define cursor. Mention its advantages. Explain the general form of a cursor declaration. **(08 Marks)**

Module-4

7 a. Explain the informal design guidelines for creating the relation schema. **(08 Marks)**
  b. Define normalization. Explain 1NF and 2NF with suitable examples. **(08 Marks)**

OR

8 a. Write an algorithm to find minimal cover of functional dependencies. Explain with an example. **(10 Marks)**
  b. Consider the two set of FD's,
  $F_1 : \{A \rightarrow B, AB \rightarrow C, D \rightarrow AC, D \rightarrow E\}$ and $F_2 : \{A \rightarrow BC, D \rightarrow AE\}$ for the relations
  $R = \{A, B, C, D, E\}$. Check whether the two FD's are equivalent or not. Justify your answer. **(06 Marks)**

Module-5

9 a. Explain the ACID properties of a transaction. Also explain why concurrency control is needed. **(10 Marks)**
  b. Write a short note on deadlock, starvation and prevention. **(06 Marks)**

OR

10 a. Explain two phase locking protocol used in concurrency control. **(08 Marks)**
  b. Illustrate the three phases of ARIES recovery model. **(08 Marks)**

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