CBCS SCHEME

USN | | | | | | | | | | |

15CS/IS53

Fifth Semester B.E. Degree Examination, July/August 2021
Database Management System

Time: 3 hrs. Max. Marks: 80

Note: Answer any FIVE full questions.

1 a. Mention the main characteristics of the database approach. **(04 Marks)**
b. Describe the three-schema architecture with a neat diagram. **(04 Marks)**
c. With a neat diagram, explain the component module of DBMS. **(08 Marks)**

2 a. Explain different types of attributes and their notations in ER diagram. **(04 Marks)**
b. Discuss the concept related to structural constraints of relationship type with suitable example. **(04 Marks)**
c. Write an ER diagram for a company database. **(08 Marks)**

3 a. Explain unary relational operators along with their syntax and example. **(04 Marks)**
b. Consider the following SAILORS database:
SAILORS (Sid, Sname, rating, age)
BOATS (bid, bname, color)
RESERVES (Sid, bid, day)
(i) Find the names of sailors who have reserved green boat.
(ii) Find the names of sailors who have reserved all boats.
(iii) Find the names of sailors who have reserved boat 103. **(06 Marks)**
c. Explain with example left outer join and right outer join. **(06 Marks)**

4 a. Explain the steps in mapping from ER to relational schema. Discuss each step with example. **(10 Marks)**
b. Describe the six clauses in the syntax of SQL retrieval query with example. Which of the six are required and which are optional? **(06 Marks)**

5 a. Consider the following relation schema:
Works (Pname, Cname, salary)
Lives (pname, street, city)
Located-in (cname, city)
Manager (pname, mgrname)
Write the SQL queries for the following:
(i) Find the names of all persons who live in the city Banglore.
(ii) Retrieve the names of all person of 'Infosys' whose salary is between Rs.50,000 and Rs.70,000.
(iii) Find the names of all persons who live and work in the same city. **(06 Marks)**
b. What is a view? Explain how views are created and dropped. **(06 Marks)**
c. Write a note on aggregate function in SQL. **(04 Marks)**

6 a. Explain the classification of drivers in JDBC. **(04 Marks)**
b. What are stored procedures? Explain with example. **(06 Marks)**
c. Explain the three-tier application architecture. State its advantages. **(06 Marks)**

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

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7 a. Explain update anomalies with example. **(04 Marks)**

b. Explain when the relational schema is said to be in 1NF. Explain different techniques to achieve 1NF. **(06 Marks)**

c. With example discuss second normal form and third normal form. **(06 Marks)**

8 a. Write an algorithm to find the closure of X.

If R = (V, W, X, Y, Z)

FD = {W →XY, Y →V, Z →V, X →Z}

Find the key of R. **(08 Marks)**

b. Consider the relation

R = {ssn, ename, Pnumber, Pname, Ploc, Hrs}

R1 = EMP = {ssn, ename}

R2 = PROJ = {Pnumber, Pname, Ploc}

R3 = WORKS_ON = {ssn, Pnumber, Hrs}

F = {ssn →Ename; Pnumber → {Pname, Ploc}; {ssn, Pnumber} → Hrs}

Prove that decomposition of R into R_1, R_2 and R_3 is lossless. **(08 Marks)**

9 a. Explain the state transition diagram of a transaction. **(04 Marks)**

b. Explain two-phase locking techniques for concurrency control. **(06 Marks)**

c. Explain the following with example:

(i) Serial schedule

(ii) Non-serial schedule

(iii) Conflict serializable schedule **(06 Marks)**

10 a. Explain concurrency control based on timestamp ordering. **(06 Marks)**

b. Explain the principles used behind ARIES algorithm. **(06 Marks)**

c. Explain Shadow-paging with example. **(04 Marks)**

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