POKHARA UNIVERSITY

Level: Bachelor | Semester: Fall | Year: 2024
Programme: BCSIT | Full Marks: 100
Course: Database Management System | Pass Marks: 45
Time: 3 hrs.

Candidates are required to answer in their own words as far as practicable. The figures in the margin indicate full marks.

Section "A"

Very Short Answer Questions

Attempt all the questions. [10×2]

1. What is Database? What is its purpose?
2. Differentiate primary key and candidate key in DBMS.
3. What is functional dependency.
4. Define views in SQL with an example.
5. List two objective of query optimization.
6. What is sequential file organizations?
7. Why we need security in DBMS?
8. Explain time stamp concept.
9. Define the term recovery.
10. List two benefit of OODM.

Section "B"

Descriptive Answer Questions

Attempt **any five** questions. [5×10]

11. a. What is data independence? Explain the difference between physical and logical data independence with example.
    b. Given a relational Schema R(A, B, C, D, E,F) and set of Function Dependency FD = { A → B, C → D, B→C,DB → F }. Check Whether ACF and AED are candidate key or not.
12. a. Why do we need Normalization? Why is it required? Explain.
    b. Explain 1NF, 2NF, 3NF & 4NF along with example.
13. Explain the concept of query cost estimation in databases. Why is it important for database performance optimization? Explain.
14. Discuss the principles of hash-based indexing in file organization. What are the advantages and limitations of using hash indexing in a database? Explain.
15. Explain the different levels of security in a DBMS, including access control, authentication, and encryption. Explain with examples.
16. Why concurrency control is required? List various state of transaction. Explain lock base concurrency control.

Section "C"

Long Answer Question

Attempt any two questions. [2×15]

17. Read the case situation given below and answer the questions that follows:

"A lecturer, identified by his or her number, name and room number, is responsible for organizing a number of course modules. Each module has a unique code and also name and each module can involve a number of lecturers who deliver part of it. A module is composed of a series of lectures and because of economic constraints and common sense, sometimes lectures on a given topic can be part of more than one module. A lecture has a time, room and date and is delivered by a lecturer and a lecturer may deliver more than one lecture. Student, identified by number and name, can attend lectures and a student must be registered for a number of modules. We also store the date on which the student first registered for that module. Finally, a lecturer acts a tutor for a number of students and each student has only one tutor."

   a. Identify entity, attributes and relationships. [5]
   b. Draw E-R diagram. [10]

18. Write SQL statements for the following operations.
   a. Create a database named bcsit and a table named employee with columns as EID, Name, Salary.
   b. Insert 3 records ram, Gita and Sita.
   c. Update the salary of Sita to 50000.
   d. Calculate sum of all salary.
   e. Create a view named "empdetails" from employee table.
   f. Delete 2nd row of data.
   g. Delete whole table.

19. a. Explain Shadow Paging in detail.
   b. What do you mean by object oriented data model? Explain the benefits of OODMS.