CBCS SCHEME

Sahyadri College of Engineering & Management
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17CS53

Fifth Semester B.E. Degree Examination, Aug./Sept.2020
Data Base Management Systems

Time: 3 hrs. Max. Marks: 100

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

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.

Module-1

1 a. With a neat diagram, explain the components modules of DBMS and their interactions. **(08 Marks)**

b. Explain the main characteristics of the database approach versus the file processing approach. **(08 Marks)**

c. Define the following with example :
i) Value set ii) Data model iii) Metadata iv) Database. **(04 Marks)**

OR

2 a. List the advantages and disadvantages of DBMS. Discuss any five advantages by comparing with file system. **(08 Marks)**

b. What are the structural constraints on a relationship type? Explain with an example. **(06 Marks)**

c. Write a short note on Specialization and Generalization, with an example for each. **(06 Marks)**

Module-2

3 a. Consider the following schema and write the relational algebra :
Sailors (SID , Sname , Rating , Age)
BOATS (BID , Bname , Color)
RESERVE (SID , BID , Day)
i) Retrieve the sailors name who have reserved red and green boats.
ii) Retrieve the sailors name with age over 20 years and reserved black boat.
iii) Retrieve the sailors name who have reserved green boat on Monday.
iv) Retrieve the number of boats which are not reserved.
v) Retrieve the sailors names who is the oldest sailor with rating 10. **(10 Marks)**

b. List Set theory operations, used in relational data model. Explain any two with an example. **(06 Marks)**

c. Define the followings :
i) Relation state ii) Domain iii) Relation schema iv) Arity. **(04 Marks)**

OR

4 a. Discuss the various types of JOIN operations with an example. Why is THETA join required? **(06 Marks)**

b. Describe the steps of an algorithm for ER – to – Relational mapping. **(10 Marks)**

c. Describe any two characteristics of relations with suitable example for each. **(04 Marks)**

Module-3

5 a. How is view created and dropped? What problems are associated with updating views? **(08 Marks)**

b. Consider the schema for COMPANY database :
EMPLOYEE (SSN, Name, Address, Sex, Salary, SuperSSN, DNo)
DEPARTMENT (DNo. Dname, MgrSSN, MgrStartDate)
DLOCATION (DNo, DLoc)
PROJECT (PNo, PName, PLocation. DNo)
WORK_ON (SSN, PNo , Hours)

Write the SQL queries to :

i) Make a list of all project numbers for projects that involve as employee whose last name is 'Scott', either as a worker or as a manager of the department that controls the project.

ii) Show the resulting salaries if every employee working on the 'IOT' project is given a 10% raise.

iii) Find the sum of salaries of all Employees of the 'accounts' departments as well as the maximum salary, the minimum salary and the average salary in this department.

iv) Retrieve the name of each Employee who works on all the projects controlled by department number 5 (Use NOT EXISTS Operator).

v) For each department that has more than five employees, retrieve the department number and the number of its Employee who are making more than Rs 6,00,000. **(12 Marks)**

OR

6 a. Define Stored Procedure. Explain the creating and calling of stored procedure with suitable example. **(08 Marks)**

b. Explain three – tier architecture, with a neat diagram. **(04 Marks)**

c. Consider the schema for STUDENT database.

STUDENTS (SID, Sname, Major , GPA)
FACULTY (FID, Fname, Dept, Designation, Salary)
COURSE (CID, Cname, FID)
ENROL (CID, SID, GRADE)

Write the following query is SQL :

1) Give a 15% raise to salary of all faculty.
2) List all the departments having an average salary of above Rs 20,000.
3) List the names of all faculty members beginning with 'R' and ending with letter "U".
4) List the names of students enrolled for the course 'GS – 53' and have received 'A' grade. **(08 Marks)**

Module-4

7 a. Explain informal design guidelines for relation schemes. **(06 Marks)**

b. What is the need for normalization? Explain 1^{st}, 2^{nd}, 3^{rd} normal forms, with an examples. **(14 Marks)**

OR

8 a. Find the minimal cover of F.D.
E : $\{B \rightarrow A , D \rightarrow A , AB \rightarrow D\}$. **(06 Marks)**

b. Consider R(A, B, C, D) with FD = $\{A \rightarrow B , B \rightarrow C , C \rightarrow D\}$.
i) Find the key ii) Indicate the highest normal form and convert the relation into BCNF. **(08 Marks)**

c. Write an algorithm to find the closure of 'X' and 'F'. **(06 Marks)**

Module-5

9 a. Explain the desirable properties of a transactions. **(08 Marks)**

b. Explain with a neat diagram, the state transition diagram for a transaction. **(08 Marks)**

c. What is two phase locking? Describe with the help of an example. **(04 Marks)**

OR

10 a. Why concurrency control is needed demonstrate with example? **(10 Marks)**

b. When deadlock and starvation problems occurs? Explain how these problems can be resolved? **(10 Marks)**

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