CBCS SCHEME

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

18CS53

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

Time: 3 hrs. Max. Marks: 100

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

Module-1

1 a. Describe the characteristics of database approach. **(08 Marks)**

b. List and explain the criteria for classification of DBMS. **(08 Marks)**

c. Write an ER diagram to represent CAR entity type with 2 key attributes Registration and Vehicle ID. **(04 Marks)**

OR

2 a. Write an UML class diagram notation for company conceptual schema. **(10 Marks)**

b. Define the following terms : i) Data Model ii) Schema iii) Instance iv) Canned transaction v) Data Manupulation Language (DML). **(10 Marks)**

Module-2

3 a. Explain the concepts of specialization and Generalization, with the help of VEHICLE superclass. **(08Marks)**

b. Explain the different Relational Model constraints. **(06 Marks)**

c. Create a table for the Works_In relationship shown in Fig. Q3(c). **(06 Marks)**

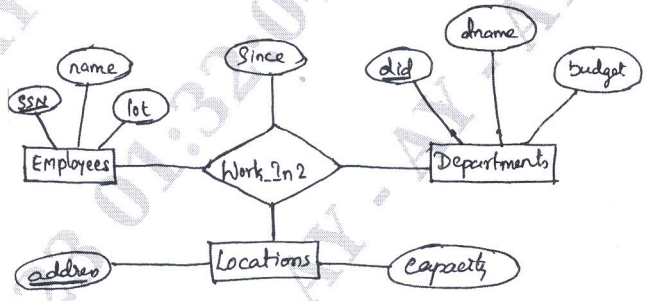


Fig. Q3(c)

OR

4 Considered the COMPANY DATABASE
EMPLOYEE (Fname , Minit , Lname , Ssn , Bdata , Address , Sex , Salary , Super_Ssn , Dno).
DEPARTMENT (Dname , Dnumber , Mgr_Ssn , Mgr_Start_data)
DEPART_LOCATIONS (Dnumber , DLocation)
PROJECT (Pname , Pnumber , PLocation , Dnum)
WORKS_ON (ESsn , Pno , Hours)
DEPENDENT (ESsn , Dependent_name , Sex , Bdate , Relationship).
Specify the following queries in SQL on the database schema given above.

a. For every project located in 'Stafford' , list the project number, the controlling department number and the department managers last name , address and birth date. **(06 Marks)**

b. Retrieve the birth date and address of the employees whose name is 'John B, Smith'. **(06 Marks)**

c. Retrieve the name and address of all employees who work for the 'Research' department. **(06 Marks)**

d. Retrieve the salary of every employee. **(02 Marks)**

Module-3

5 a. Discuss EXISTS and UNIQUE functions in SQL. Consider the COMPANY database given in Question number 04, write a query to list the name of the Manager who have atleast one dependent. **(08 Marks)**

b. With a real World example, explain the following :
i) JDBC ii) Correlated nested queries iii) Stored Procedures
iv) Schema change statements in SQL. **(12 Marks)**

OR

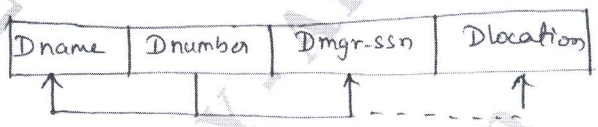
6 a. Explain the usage of Aggregate function in SQL. Write an SQL query to find sum of the salaries of all employees, the maximum salary, the minimum salary and the average salary by renaming the columns in a single row table. **(10 Marks)**

b. Create an HTML form to collect user id and password fields and it also has to have two buttons one for reset and another for login. **(06 Marks)**

c. Write a short note on : i) JavaScript ii) CGI. **(04 Marks)**

Module-4

7 a. Describe the 3 main techniques to achieve first normal form for the relation by taking following examples schema. **(04 Marks)**



b. Discuss the Informal guidelines to determine the quality of relations schema design with a suitable example. **(10 Marks)**

c. Discuss the Insertion , Deletion and Modification anomalies. Illustrate, why are they considered bad, with an example. **(06 Marks)**

OR

8 a. What do you mean by Normalization? Explain 2NF and BCNF, with a suitable example. **(06 Marks)**

b. Consider the universal relation R = {A, B, C, D, E, F, G, H, I, J} and the set of functional dependencies
F = {{A, B} → {C} {A} → {D, E} , {B} → {F} , {F} → {G, H} , {D} → {I, J}}.
i) What is key of R? ii) Decompose R into 2NF and then 3NF relation. **(06 Marks)**

c. Write an algorithm to find a minimal cover F for a set of functional dependencies E. **(08 Marks)**

Module-5

9 a. Discuss the ACID properties of database transaction. **(08 Marks)**

b. Why concurrency control is needed? Demonstrate with an example. **(12 Marks)**

OR

10 a. Briefly explain 2 phase locking protocols. **(05 Marks)**

b. Explain Transaction support in SQL. **(05 Marks)**

c. Write a short note on :
i) Single user and Multiuser system.
ii) Transaction roll back and Cascadding roll back.
iii) Shadow paging.
iv) Database backup and recovery from catastrophic failure.
v) Deadlock prevention protocol. **(10 Marks)**

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