U.G. 5th Semester Examination - 2020

COMPUTER SCIENCE

[PROGRAMME]

Discipline Specific Elective (DSE)

Course Code : COM.SC-G-DSE-L-501A

(Database Management Systems)

Full Marks : 40 Time : $2\frac{1}{2}$ Hours

The figures in the right-hand margin indicate marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP-A

Answer any **five** questions: 2×5=10

1. a) What is data abstraction?

   b) Write any two SQL functions for string conversions.

   c) Define the following terms and give examples.
   (i) cardinality (ii)unary relationships

   d) What are the semantic constraints in SQL?

   e) What are the properties of transactions?

   f) What is a surrogate key?

   g) Define functional dependency.

   h) What is a trigger?

GROUP-B

Answer any **two** questions: 5×2=10

2. a) Discuss the different database anomalies. 5

   b) What do you mean by degree of a relationship? What is cardinality of a relationship? What is a ternary relationship? 1+1+2+1=5

   c) What is multi valued dependency? Explain Natural Join with Example. 2+3=5

   d) Suppose that we decompose the schema, 5
   R = (A, B, C, D, E) into (A, B, C) and (A, D, E). Show that this decomposition is loss less decomposition, if the following set F of FDs holds

   $A \rightarrow BC$

   $CD \rightarrow E$

   $B \rightarrow D$

   $E \rightarrow A$

GROUP-C

Answer any **two** questions: 10×2=20

3. a) Explain the three schema architecture of DBMS. Write down the functions of a DBA. 5+5=10

   b) Consider the following two schemas : 2×5=10
   EMP (EMP#, ENAME, JOB, HIREDATE, MANAGER#, SALARY, COMM, DEPT#).

DEPT (DEPT#, DNAME, LOCATION)

Perform the following queries on the tables (Write appropriate SQL statement) :

i) List the name, salary and PF amounts of all employees (PF is calculated as 10% of the basic)

ii) List the number of employees and average salary in DEPT# 20.

iii) List the department number and total salary payable in each department.

iv) List the names of the employees who are more than 20 years old in the company.

v) List the names of the employees whose name either starts or ends with 'S'.

c) Normalize the following relation up to 3NF:

6+4=10

Bank(acno, cust_name, ac_type, bal, int_rate, cust_city, branchid, branch_nm, br_city)

Explain Data Independence and its types in detail.

d) Write short notes on the following: (i) Inner join and Outer join. (ii) Sparse index and Dense index.

5+5=10

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