U.G. 3rd Semester Examination-2020

COMPUTER SCIENCE

[PROGRAMME]

Course Code : COM.SC-G-CC-L-301C

(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

1. Answer any **five** questions from the following: $2\times5=10$

   a) What is data inconsistency?

   b) What is logical schema?

   c) What is DDL?

   d) Which command is used to modify a column inside a table?

   e) What is weak entity set?

   f) What is lossy decomposition?

   g) What is tuple?

   h) Define Second Normal Form.

GROUP-B

Answer any **two** questions from the following: $5\times2=10$

2. a) What are the advantages of database system over file processing system? 3

   b) 'SQL is relationally complete'– justify. 2

3. a) What is normalization? 2

   b) Normalize the following relation and the FD-set upto 3NF: 3

   student (stud_no, stud_name, stud_state, stud_country, stud_age)

   Here, stud_no is the candidate key.

   {

   stud_no $\rightarrow$ stud_name,

   stud_no $\rightarrow$ stud_state,

   stud_state $\rightarrow$ stud_country,

   stud_no $\rightarrow$ stud_age

   }

4. Consider the given problem. In a University, a student enrolls in courses. A student must be assigned to at least one or more courses. Each course is taught by a single professor. To maintain instruction quality, a professor can deliver only one course. Create an ER diagram to represent the problem. 5

5. a) What is the difference between natural join and cross join? Explain with example. 2

b) What are aggregate functions? Name few of them. 2+1

GROUP-C

Answer any **two** questions from the following: 10×2=20

6. a) Draw and explain the three level architecture of database. 1+4

b) Explain the various keys in database. 5

7. Consider the following relational schema:

employee (empno, name, office, age)

books (isbn, title, authors, publisher)

loan (empno, isbn, date)

Write the following queries in relational algebra:

a) Find the name of employees who have borrowed a book published by 'Jacobs'.

b) Find the name of employees who have borrowed all books published by 'Jacobs'.

c) Find the name of employees who have borrowed more than five different books published by 'Jacobs'. 3+3+4

8. a) What is integrity constraint? 2

b) Explain referential integrity constraint with example. 3

c) Explain generalization and specialization with the help of an ERD. 5

9. a) What is the role of database administrator (DBA)? 4

b) Write down SQL queries for all the set-operations on the given tables: 6

A

ID	NAME
1	abhi
2	adam

B

ID	NAME
2	adam
3	chester

———————