Graphic Era Hill University

Established by an Act of the State Legislature of Uttarakhand (Adhiniyam Sankhya 12 of 2011)
University under section 2(f) of UGC Act, 1956

Term Evaluation (Even) Semester Examination March 2025

Roll no.....

Name of the Program: MCA — *Semester: 2nd*

Name of the Course: Advance Database Management System — *Course Code: TMC 201*

Time: 1-1/2 Hour — Maximum Marks: 50

Note:

(i) Answer **all the questions** by choosing ***any one of the sub questions***.

(ii) Each question carries 10 marks

Q1	(10 marks)	**Co1**
(a)	Consider a University domain which keeps information about Students, Faculty, Classes, and Enrolment etc. They maintain all the information in spreadsheets. (i) As a database expert, point out the drawbacks of using this system. Highlight the advantages of migrating to a relational database model. [5] ii. Discuss the people who work behind the scene to maintain the database environment. [5]	
	OR	
(b)	Explain the difference between internal, conceptual and external schemas. How are these different schemas layer related to the concept of logical and physical data independency?	
Q2	(10 marks)	**Co2**
(a)	Explain the component module of DBMS and their interaction, with the help of diagram.	
	OR	
(b)	Explain the concept of generalization and specialization. Define the various constraints that can be specified while using generalization.	
Q3	(10 marks)	**Co5**
(a)	a) As per the rules of the company, how can you limit the entry of such ambiguous data in to the table at the database level? Illustrate with Constraints for the following statements i. Every supplier should have a name. ii. Every supplier should have a supplier code that is distinct, and the length of the supplier code should be equal to six digits. iii. Quantity of product supplied should be greater than zero and less than 200. Iv. Order date should be less than the current date. b) What are the responsibilities of a DBA? If we assume that the DBA is never interested in running his or her own queries, does the DBA still need to understand query optimization?	
	OR	
(b)	Define the following terms: 1. Schema and Instances 2. Controlled redundancy 3. Domain Integrity Constraints 4. Referential Integrity Constraint 5. Relational algebra set operations	
Q4	(10 marks)	**CO3**

(a) Compare primary key, candidate key, super key, alternate key and minimal super key. From the below tables identify primary key, candidate key, super key, alternate key and minimal super key and justify.

STUDENT

STUD_NO	STUD_NAME	STUD_PHONE	STUD_STATE	STUD_COUNTRY	STUD_AGE
1	RAM	9716271721	Haryana	India	20
2	RAM	9898291281	Punjab	India	19
3	SUJIT	7898291981	Rajsthan	India	18
4	SURESH		Punjab	India	21

Table 1

STUDENT_COURSE

STUD_NO	COURSE_NO	COURSE_NAME
1	C1	DBMS
2	C2	Computer Networks
1	C2	Computer Networks

Table 2

OR

(b) Students are assigned to mentors. Every mentor can be assigned maximum of 20 students. Every student should have a guardian. Guardians are allowed to register multiple phone numbers. Students should register for courses. Every course should have a slot and venue allocated to it.
a) Identify entities, attributes and relationships giving functionalities and draw E-R diagram for the system.
b) Convert this to relational tables explaining logic involved.

Q5 (10 marks)

(a) Consider the relation Employee(eid, ename, city, dname) with some tuples given below:

i. Discuss and provide the solution for the various anomalies with respect to the operations like insertion, deletion and updation which will reduce the redundancy and complexity of data.

ii. Check if this relation is in 1NF, if not change it to 1NF.

Eid	Ename	City	Dname
101	Smith	Dehradun	Sales, Marketing
102	Clark	Delhi	Marketing
103	Jone	Chennai	HR

OR

(b) Write SQL queries for following

i) Create table EMP with following attributes using suitable data types and constraints(Eno, Ename, Deptno, Salary, designation, Joining Date)

ii) Insert a row in the table.

iii) Display names of employee who are working in deptno 10, 20 or 30

iv) Display names of employees who joined in the month of April.

v) Display the information of employees whose salary do not lies in the range of 20000 to 10000.