Name: **Enrolment No:**	

UPES
End Semester Examination, May 2024

Course: DATABASES **Semester: II**
Program: BCA **Time : 03 hrs.**
Course Code: CSEG1037 **Max. Marks: 100**

Instructions: All sections are compulsory to attend.

SECTION A
(5Qx4M=20Marks)

S. No.	All questions are compulsory.	**Marks**	**CO**
Q1	State the four database users.	**4M**	**CO1**
Q2	Elucidate the concept of Generalization and Specialization.	**4M**	**CO1**
Q3	Enlist four aggregate functions with their syntax.	**4M**	**CO2**
Q4	State the important Constraints for a relation to be in 2NF.	**4M**	**CO2**
Q5	Define the roles of DBA.	**4M**	**CO1**

SECTION B
(4Qx10M= 40 Marks)

Q6	Consider the following schema: Suppliers (sid : integer, sname : string, address : string) Parts (pid : integer, pname : string, color : string) Catalog (sid : integer, pid : integer, cost : real) The key fields are underlined, and domain of each field is listed after the field name. Write Relational Algebra query for the following: 1) Find the sids of suppliers who supply some red part or are at 221 packer Ave. 2) Find the sids of suppliers who supply some red part and some green part.	**10M**	**CO2**
Q7	Explain the concept of primary key and foreign key with the help of an example.	**10M**	**CO4**
Q8	Write SQL query for following consider table EMP (empno, deptno, ename, salary, Designation, joining date, DOB, city) (i) Display employees' names and number in an increasing order of salary.	**10M**	**CO2**

	(ii) Display employee name and employee number dept wise. (iii) Display total salary of all employees. (iv) Display number of employees dept wise (v) Display employee name having experience more than 3 years.		
Q9	Draw an ER diagram for Hospital Management System. (Use DOCTOR, PATIENT, HOSPITAL and MEDICAL_RECORD Entity). Identify Primary Key and Foreign Key. OR Relational algebra is a procedural query language. Explain it with all its five operations.	**10M**	**CO3**
SECTION-C (2Qx20M=40 Marks)			
Q10	(i) Write the necessary conditions to check for lossless join decomposition using Functional Dependency set. (ii) Consider a relation schema R (A, B, C, D) with the functional dependencies A → B and C → D. Determine whether the decomposition of R into R1 (A, B) and R2 (C, D) is lossless or lossy. OR (i) Define Normalization and state three advantages of normalization. (ii) Given a relation R(P, Q, R, S, T, U, V, W, X, Y) and Functional Dependency set FD = { PQ → R, PS → VW, QS → TU, P → X, W → Y }, determine whether the given R is in 2NF? If not convert it into 2 NF.	**20M**	**CO4**
Q11	(i) State the difference between Partial Dependency and Fully Functional Dependency with an example. (ii) Suppose a relational schema R (A, B, C, D, E) and set of functional dependencies: F {A → BC, CD →E, B →D, E →A} Compute CD+, E+ (closure of attribute set CD, attribute E respectively). (iii) Determine the closure of the following set of functional dependencies for a relational scheme R (A, B, C, D, E, F) = {A→BC, CD→E, B→D, E→A}. List out the candidate keys of R.	**20M**	**CO2**