Name: **Enrolment No:**	

UPES

End Semester Examination, May 2025

Course: Data Base Management Systems **Semester: II**

Program: MCA **Time : 03 hrs.**

Course Code: CSEG7024 **Max. Marks: 100**

Instructions: Calculators are not allowed.

SECTION A
(5Qx4M=20Marks)

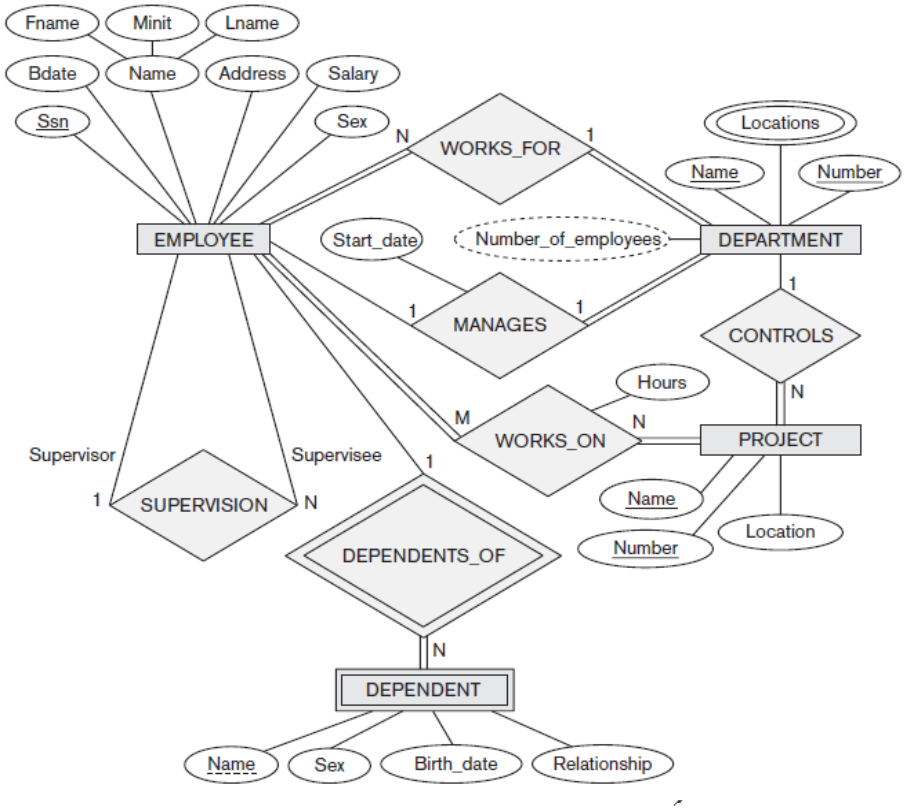
S. No.		Marks	CO
Q 1	What is logical data independence and why is it important?	**4**	**CO 1**
Q 2	Difference between weak entity and strong entity with suitable examples.	**4**	**CO 1**
Q 3	Consider a relation R (A, B, C, D, E) with the following three functional dependencies. {AB → C; BC → D; C → E;} Find the number of super keys in the relation R.	**4**	**CO 4**
Q 4	Explain referential integrity constraint with the help of suitable example.	**4**	**CO 5**
Q 5	What are the responsibilities of a DBA?	**4**	**CO 5**

SECTION B
(4Qx10M= 40 Marks)

Q 6	Explain relationship and relationship types (one to one, one to many, many to one and many to many) in DBMS with examples. **OR** Explain three schema architecture with a neat diagram.	**10**	**CO 1**
Q 7	Discuss the different types of file organization.	**10**	**CO 2**
Q 8	Explain the different types of JOIN operations in relational algebra.	**10**	**CO 3**
Q 9	Discuss the different types of problems that can arise with concurrent transactions with suitable examples.	**10**	**CO 5**

SECTION-C
(2Qx20M=40 Marks)

Q 10	(a) Explain 1NF, 2NF, 3NF and BCNF with examples. (b) The relation scheme Student Performance (name, courseNo, rollNo, grade) has the following functional dependencies: name, courseNo → grade rollNo, courseNo → grade name → rollNo	**(10+10)**	**CO 4**

	rollNo → name Find the highest normal form of this relation schema. **OR** (a) Illustrate dependency preservation and lossless-join decomposition in normalization with examples. (b) Let R (A, B, C, D) be a relational schema with the following functional dependencies: A → B, B → C, C → D and D → B}. Check whether the decomposition of R into (A, B), (B, C), (B, D) is Lossless or lossy and functional dependency preserving or not?		
Q 11	(a) A company database needs to store information about employees (identified by ssn, with salary and phone as attributes), departments (identified by dno, with dname and budget as attributes), and children of employees (with name and age as attributes). Employees work in departments; each department is managed by an employee; a child must be identified uniquely by name when the parent (who is an employee; assume that only one parent works for the company) is known. We are not interested in information about a child once the parent leaves the company. Draw an ER diagram that captures this information. (b) Identify the various relationships and its cardinality ratio and participation constraint of each relationship type in the given ER diagram  	**(10+10)**	**CO 5**