INDIAN INSTITUTE OF INFORMATION TECHNOLOGY, SRI CITY

TERM-II EXAMINATION – Monsoon 2024

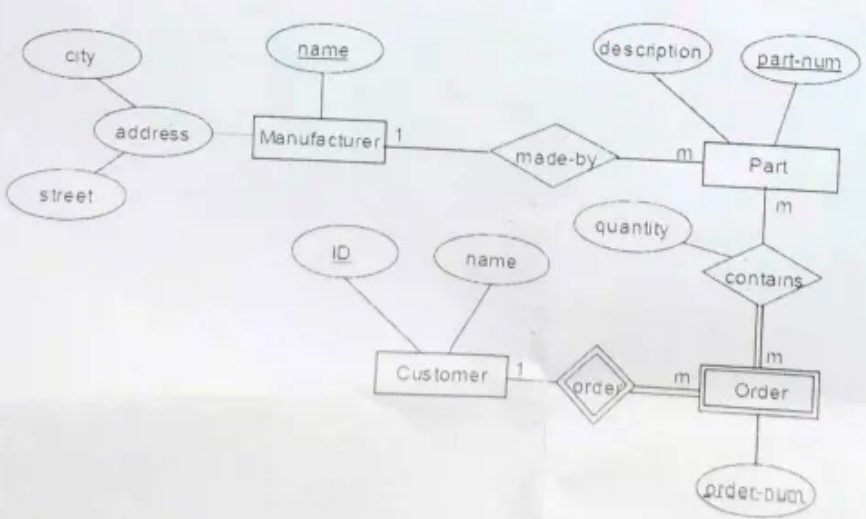
Subject Name: DBMS

CSE: UG2 (PC) **Date: 19-10-2024**

Duration: 90 Mins (3:30-5:00 PM) **Max. Marks: 25**

Instructions: **Roll No:**

1. All questions are compulsory.
2. Write the answers legibly.
3. Electronic Gadgets like mobile phones, laptops, smartwatches are not allowed.
4. Scientific Calculator is allowed

1	Given an relation schemas **Employee (ID, name, salary, dept_name)** and **Department(dept_name, building, budget)** a. Using tuple relational calculus, find the **ID** and **name** of all the employee who work in **Subash building**. *(Make necessary assumptions)* b. Using domain relational calculus, find the **ID** and **name** of all the employee whose salary is greater than 50000/- and work in **Subash building**. *(Make necessary assumptions)*	[4 Marks]
2	Give an example when a tuple relation expression may generate infinite relations. How do you make sure that any given tuple expression is safe.	[2 Marks]
3	Please answer the following based on the E-R diagram below.  	
	a) Find out the identifying relationship and discriminator attribute.	[1 mark]
	b) Is there any composite attribute in the above diagram, if yes, please write about it.	[1 mark]
	c) Specify the (min…max) constraint on each participation of an entity set in "**made by** and **contains** relationship sets.	[2 Marks]

	d) Map the E-R diagram into a relational model specifying the schemas with all primary keys and foreign keys.	[6 Marks]
4	If a relation has attributes A, B, C, D and the FDs are A→B and B→C, then A can be said to functionally determine _____ due to _____ property.	[1 Mark]
5	Suppose a relational schema R(P, Q, R, S), and set of functional dependency as following F : { P→ QR, Q→R, P→Q, PQ→ R } Find the canonical cover Fc	[4 Marks]
6	a) Derive the Functional Dependencies (FDs) based on the data in the table	[2 Marks]

A(EmpID)	B(Department)	C(ManagerID)	D(ProjectID)	E(Project Location)
101	Sales	M001	P001	NY
102	Sales	M001	P002	LA
103	HR	M002	P003	SF
104	IT	M003	P001	NY
105	IT	M003	P004	LA

	b) Identify all Candidate Keys for the relation R(A,B,C,D,E) given in above table	[2 Marks]