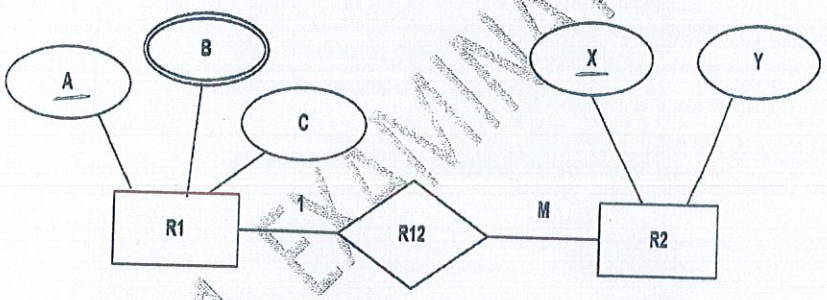
JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT
TEST -1 EXAMINATION- 2025
B.Tech-III Semester (CSE & IT)

COURSE CODE (CREDITS):25B11CI313 (3) MAX. MARKS: 15

COURSE NAME: DATABASE MANAGEMENT SYSTEMS

COURSE INSTRUCTORS:{**Pardeep, Ekta, Amol, Pankaj, Nitika & Gourav**} MAX. TIME: 1 Hour

Note: *(a) All questions are compulsory.*
(b) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems.
(c) Students are required to solve questions in detailed way and write step by step solutions while answering.

Q.No	Question	CO	Marks
Q1	Suppose R1(A,B) and R2(C,D) are two relational schemas. B is a foreign key that refers to C in R2. If data in R1 and R2 satisfy referential integrity constraints, then what would be the value of $\pi_B(R1) - \pi_C(R2)$=?	3	2
Q2	Consider the E-R diagram given as under:  a. How many relations are needed in general to convert the above E-R diagram into relational model? b. Write the relational schemas of your number of tables answered in part a. c. If we want to reduce the number of tables, then how many minimum numbers of tables are required to implement the E-R diagram into relational model? d. Write the relational schemas for the reduced number of tables answered in part c.	2	3

Q3	Let E1(Sid, Name, Age) and E2 (Cid, Salary, Address) be two entities in an E-R diagram with simple single valued attributes. Name and address are composite attributes with composition as follows: - **Name: First Name, Last Name and Middle Name** and **Address: State, City and Street.** R1 and R2 are two relationships between E1 and E2 where R1 is one to many and R2 is many to many cardinalities. R1 and R2 do not have any attributes of their own. (i) Draw the E-R diagram of the given description. (ii) What are the minimum number of relations required to implement the E-R design into relational model? (iii) Write the relational schemas of resultant tables obtained in part (ii).	3	3
Q4	Consider the student relation given as under: (i) Write the relational algebra query to find out the Sid of students who are enrolled in at least two courses? (ii) Show step by step execution of your relational algebra query answered in part (i).	3	3
Q5	Consider the relations student and department given as under: (i) Write the relational algebra query to find the student's name who are studying in a department having location same as the address. (ii) Show step by step execution of your relational algebra query answered in part (i).	2	2
Q6	Explain three schema architecture of Database Management Systems with suitable diagram.	1	2

Sid	C-id	Since
S1	C1	2016
S2	C2	2017
S1	C2	2017
S3	C1	2015
S3	C2	2010

Student:

S-Id	S-Name	Address
1	A	Delhi
2	B	Chandigarh
3	C	Chandigarh
4	D	Delhi

Department:

D-No	Location	S-Id
D1	Delhi	1
D2	Pune	2
D3	Patna	4