07139

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Semester III (B.Tech.)

Er. No. 20183308

Academic Year: 2021-22

Jaypee University of Engineering &Technology, Guna

T-2(Odd Semester 2021)

18B11CI~~302~~ 312 – DATABASE SYSTEMS

Maximum Duration: 1 Hour 30 Minutes

Maximum Marks: 25

Notes:

1. This question paper has **SIX** questions.
2. Write relevant answers only.
3. Do not write anything on question paper (Except your Er. No.).

Marks

Q1. Following functional dependencies exist: **[05]**

AB →C, A→D, A→E, B→F, F→G, F→H, D→I, and D→J on a relation R with attributes A, B, C, D, E, F, G, H, I, and J.

i. Find all possible candidate key(s) for R. — ×1

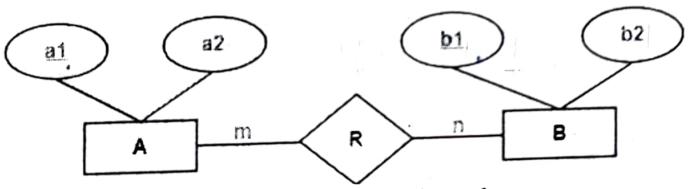
ii. Which normal form R is in with above FDs? — ×1

iii. Normalize R up to 3NF. — ×3

4

Q2. Consider an ER Diagram given below with Binary relationship and cardinality ratio (m:n) between entity types A and B. For ER to database table mapping, how many tables will be created? Also indicate attributes per table. **[03]**

3



Q3. a. Consider relation R (A, B, C, TUPLE#) with tuples: **[03]**

2

A	B	C	TUPLE#
10	b1	c1	1
10	b2	c2	2
11	b4	c1	3
12	b3	c4	4
13	b1	c1	5
14	b3	c4	6

Find all possible functional dependencies based on the database state given above table/relation R.

b. Consider a relation/table **Student (SID, FName, LName, Address)** which is already created under database and perform following operations using SQL by following MySQL syntax. [02]

i. Change column name **Address** to **Permanent Address**

ii. Make **SID** primary key

Q4. What is the difference between logical data independence and physical data independence? Which one is harder to achieve? Why? [04]

Q5. Suppose we have a company database schema with employee entity having ten attributes and eight tuples. Explain the full procedure for creating the definition of table entity and for insertion of all tuples values using the text (.txt) file. [05]

Q6. Write the queries in Relational algebra to get the name (Fname , Lname) of the manager of each department and list the project number, the controlling department number and the department manager's last name, address and birth date for every project located in 'Stafford'. Assume Company database schema. [03]

Sol-1 (iii) 2NF → 3 Tables formed

T1 { A, B, C }

T2 { A, D, E, I, J }

T3 { B, F, G, H }

3NF –

T1 { A, B, C }

T2$_1$ { A, D, E }

T2$_2$ { D, I, J }

T3$_1$ – { B, F }

T3$_2$ – { F, G, H }