BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS: BTECH **SEMESTER : IV**
BRANCH: CP&P/MECH/PROD/EEE/ECE **SESSION : SP/2023**

SUBJECT: CS301 DATABASE MANAGEMENT SYSTEM

TIME: 3 Hours **FULL MARKS: 50**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
***4*. Before attempting the question paper, be sure that you have got the correct question paper.**
***5*. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates**

			CO	BL
Q.1(a)	Suppose you are given the following requirements for a simple database for the National Hockey League (NHL): • the NHL has many teams, • each team has a name, a city, a coach, a captain, and a set of players, • each player belongs to only one team, • each player has a name, a position (such as left wing or goalie), a skill level, and a set of injury records, • a team captain is also a player, • a game is played between two teams (referred to as host_team and guest_team) and has a date (such as May 11th, 1999) and a score (such as 4 to 2). *Construct a clean and concise ER diagram for the NHL database*.	[5]	CO3	4
Q.1(b)	Reduce the above (Q.1(a)) E-R diagram into their equivalent tables.	[5]	CO4	3
Q.2(a)	Discuss the following with suitable examples: a) Primary key & foreign key b) Candidate key & alternate key	[5]	CO2	2
Q.2(b)	Consider the following schema. Suppliers (s-id, s-name, address) Parts (p-id, s-name, color) Catalog (s-id, p-id, cost) Write the following query in Relational Algebra where keys are s-id, p-id, & s-id+p-id keys for Suppliers, Parts, and Catalog respectively. 1. Find the supplier name who supplies some red or green part. 2. Find the s-ids of suppliers who supply some red part and live at Delhi. 3. Find s-id of suppliers who supply red part of cost 5000/-.	[5]	CO4	3
Q.3(a)	What is normalization? Explain its need.	[5]	CO2	2
Q.3(b)	Differentiate between 3NF and BCNF with suitable examples	[5]	CO3	2
Q.4(a)	Discuss the process of Query processing and Optimization.	[5]	CO4	4
Q.4(b)	Differentiate between Static and Dynamic Hashing with suitable example.	[5]	CO4	2
Q.5(a)	Discuss Transaction Concept & their ACID properties.	[5]	CO5	2
Q.5(b)	Discuss detailed diagram of the database architecture.	[5]	CO1	2

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