THE NORTHCAP UNIVERSITY	**School/ Department: Computer Science and Engineering** **Class: B Tech CSE Jan – May 2025** **Section:** **Subject Name: DBMS** **Subject Code: CSL214** **Faculty Name:**

Q1. 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 using the Chen notation as in your textbook. List your assumptions and clearly indicate the cardinality mappings as well as any role indicators in your ER diagram.

Please note multiple diagrams are possible depending on assumptions.

Q2. Congratulations! You have gotten a job planning databases for the European Union. Your first on job assignment is to help the various countries maintain information about their inhabitants. Your model should capture the following information:

• In each country, there are provinces, which contain towns. There cannot be two provinces with the same name in a single country. Similarly, there cannot be two towns with the same name in a single province.
• People live in towns. Men and women work in a town. Children learn in a school in a town.
• A person can be a man, a woman, or a child, and has a first-name, last-name, id, and birthday. Children are any people under the age of 18.
• A man can be married to a woman (polygamy is not allowed, i.e., one man can be married only to one woman). Although the Pope strongly disapproves, divorce, and subsequent remarriage, is possible.
• For each marriage, store the date of the marriage and information about who are the children of the married couple. You should assume that the parents of a child were married at the time

of his birth.

Draw an entity relationship diagram to model the information described above. Remember to put edge constraints (arrows) and participation constraints (thick lines) where needed. Underline the key attributes of each entity in the diagram.

Q3. Design an E-R diagram for keeping track of the exploits of your favourite sports team. You should store the matches played, the scores in each match, the players in each match and individual player statistics for each match. Summary statistics should be modeled as derived attributes. Further, extend the E-R diagram of the previous question to track the same information for all teams in a league.

Q4. We can convert any weak entity set to a strong entity set by simply adding appropriate attributes. Why, then, do we have weak entity sets?

Q5. Construct an E-R diagram for a car-insurance company whose customers own one or more cars each. Each car has associated with it zero to any number of recorded accidents.