

## Chennai Mathematical Institute

RDBMS AND SQL

DEADLINE: FEB 22, 2021 11:59 PM. MAX MARKS: 15.

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ROLL NO.: \_\_\_\_\_

NAME: \_\_\_\_\_

## Instructions:

- (1) This is an individual assignment.
  - (2) Wherever possible, make your assumptions explicit.
  - (3) Your assignment should not exceed 4 pages of A4 size paper. You may write, scan and upload your work. Alternatively, you may use MS Word or Overleaf for writing your assignment.
  - (4) Submit your assignment solution as a single pdf file on moodle.
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Several chess tournaments keep happening all around the world. With growing number of chess fans, the business of maintaining a database of chess games along with details such as player information, venues, schedules, results and relevant statistics, is very useful in building lucrative businesses such as chess24.com, chess.com and en.chessbase.com. Inspired by these websites, we are interested in understanding, capturing and analyzing the data that is generated from chess tournaments.

For this assignment, specifically answer the following questions:

- (1) Draw an **ER diagram** to model a part of the chess tournaments domain. Your ER diagram should have at least 5 entities, 5 relationships and 10 attributes in total. Identify at least one **weak entity**. Enrich your diagram with **mapping cardinalities**. Explain your **design choices** in your ER model. (6 marks)
- (2) Convert the ER diagram into a relational form. Draw the tables, and fill them with two sample records. (5 marks)
- (3) Assume that there is a *results* relation with attributes (*playerID*, *tournamentID*, *gameID*, *color*, *result*). You may make reasonable assumptions about the semantics and type of these attributes. Say, a record may look like (10023, 3445, 121, 1, 1) meaning that the player with ID 10023 participated in tournament with ID 3445 and won the 121st game of that tournament with white pieces. Write the relational algebra expressions for the following queries:
  - (a) Find the player with minimum wins across all tournaments. (1 mark)
  - (b) Find the tournament with maximum draws. (1 mark)
  - (c) List all the games that were not drawn. (1 mark)
  - (d) List all the tournamentIDs and gameIDs where the player with white pieces won. (1 mark)

You may use extended relational operations including aggregate functions.

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