BRAC UNIVERSITY
Department of Computer Science and Engineering

Examination: Midterm
Duration: 1 hr
(+ 10 mins for submission)

Semester: Fall 2023
Full Marks: 25

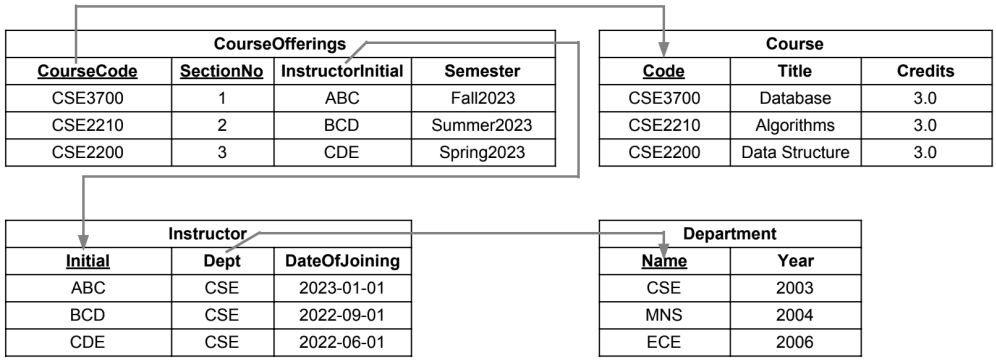
CSE 370: Database Systems

Answer **ALL** of the following questions.
Understanding the question is part of the exam, so **DO NOT** ask questions and answer to the best of your understanding.

Figures in the right margin indicate marks.

---

1. CO1 Consider the database state below (primary keys are underlined, foreign keys are shown using arrows): 5



CourseOfferings

CourseCode	SectionNo	InstructorInitial	Semester
CSE3700	1	ABC	Fall2023
CSE2210	2	BCD	Summer2023
CSE2200	3	CDE	Spring2023

Course

Code	Title	Credits
CSE3700	Database	3.0
CSE2210	Algorithms	3.0
CSE2200	Data Structure	3.0

Instructor

Initial	Dept	DateOfJoining
ABC	CSE	2023-01-01
BCD	CSE	2022-09-01
CDE	CSE	2022-06-01

Department

Name	Year
CSE	2003
MNS	2004
ECE	2006

If the operation below is executed, **identify** all constraints that will be violated and **explain** how you can enforce these constraints to ensure no violation occurs.

Operation : Modify the value of Initial attribute to **'ABF'**, Dept attribute to **'CS'** and DateOfJoining attribute to **2023** of the tuple with Initial='ABC' in the Instructor table.

2. CO2 You have been approached by a tech company to create a database system to manage their hackathon events. **Construct** an ER diagram to fulfill the following data requirements: 12

a. Each hackathon has a unique ID, a name, a description, a date, and a location. Additionally, hackathons can have multiple focus areas.

b. A Participant can participate in many hackathons. Each participant has a unique participant ID, a photo, name, and email.

c. Expert judges attend hackathons. Each judge has a unique judge ID, a name, and an area of expertise. A particular judge can attend multiple hackathons. Judges receive a remuneration for attending hackathons.

d. Participants submit project solutions. Each solution has a timestamp, description of solution, the code file and final points. Note, that different solutions can have the same timestamp and also other attributes are not guaranteed to be unique.

e. The final points for a solution is the average of scores from all the judges which can be calculated accordingly and is not stored in the database, but should be shown using the appropriate symbol.

f. Judges evaluate multiple solutions and a solution must be evaluated by multiple judges. The score for each evaluation is recorded. The score is composed of scores for innovation, completeness and robustness.

Do not assume any attributes/entities/relationships/multivalued/composite other than the ones mentioned above. For participation constraints/ cardinality ratios, if they are not hinted at in the question, you may assume according to your logical reasoning.

3. CO2 Design an EER diagram for an "Event Management" company. The company uses a database system to keep track of all their events such as weddings, birthdays etc., customers, venues, employees, service providers such as caterers, decorators etc, departments etc. 8

You can design your EER as you wish, but it must satisfy the following constraints:

a. there should be at least one overlapping-total specialization/generalization,
b. there should be at least four regular entities (excluding subclasses),
c. there must be a recursive relationship,
d. there must be at least one 1:N relationship.

Show the important attributes of all the entities and any relationships required. The EER diagram should be clear and realistic, representing the database of the given scenario.