**EAST WEST UNIVERSITY**
Department of Computer Science and Engineering
B.Sc. in Computer Science and Engineering Program
Mid Term Assessment II (Online), Summer 2021 Semester

Course:	**CSE 302 Database Systems**
Instructor:	**Mohammad Rezwanul Huq, Ph.D., Associate Professor, CSE Department**
Full Marks:	**100 (15 will be counted for final grading)**
Time:	**1 Hour 20 Minutes + 10 Minutes for uploading the answer**

Note: There are **5** (**FIVE**) questions. Answer ALL of them. The Mark of each question is mentioned at the right margin.

1. Consider the following schema diagram of the Movie database.   [Mark: 32]
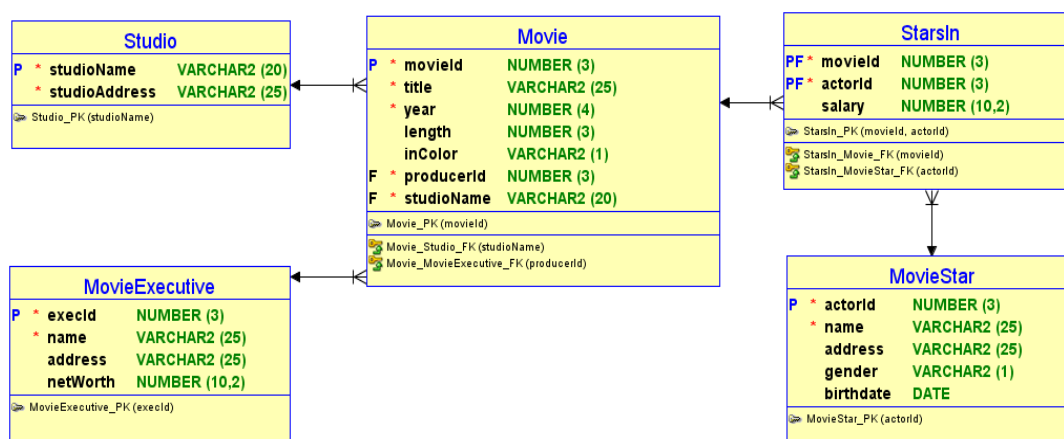
Formulate SQL Statements to answer the following queries based on the schema diagram shown above.

a) Find the title, year and studio name of the movies in which the movie title starts with the letter 'A' and has 'in' as a substring.

b) Prepare a report that shows the number of movies released having duration (length) less than 120 minutes and more than or equal to 120 minutes, for each year. A sample output of the query is shown in the following.

Year	Length < 120	Length >= 120
1990	10	15
1991	20	15

c) Find the name of the actor who has been paid the highest salary for acting in a movie. You must use ALL keyword but cannot use any aggregate functions.

d) Find the producer names of the movies of 'Harrison Ford' (actor). Write the statement using subqueries in FROM clause.

e) Find the name and net worth of a movie executive (producer) who produced more than 5 movies. Sort the result in the descending order of net worth. Write the statement without using HAVING clause.

f) Find the actor name and address who was born after 1980 and earned more than at least one of the actors born after 1970.

g) Find actor name and gender who worked with all producers.

h) Find those movie titles which have the total salaries paid to its actors is more than the net worth of its producer. You must use WITH clause.

2. Consider the following relations. [Mark: 12]

Student

ID	Name	City	Phone
1	Alice	Dhaka	01992123456
2	Bob	Khulna	01729123456
3	Charlie	Gazipur	01711123456
4	Danny	Dhaka	01827123456

Student_Sports

| ID	Favourite_Sports
1	Football
2	Cricket
2	Football
3	Cricket
4	Football

All_Sports

Sports_name
Football
Cricket

Write a relational algebra expression to find the id and name of the students who likes all available sports based on the tables mentioned above. You must show step by step expressions with intermediate result set to find the final result. You must also show the final result.

3. Assume that you have two entity sets A and B. **Using appropriate notations of ER model, express the followings.** You do not have to mention any attributes if not said otherwise. [Mark: 16]

a) An entity in A can be associated with at most one entity in B whereas an entity in B can be associated with several (possibly 0) entities in A and not all entities in A are participating in this relationship.

b) An entity in A can be associated with several (possibly 0) entities in B whereas an entity in B can be associated with several (at least 1) entities in A. The relationship itself has an attribute known as 'attr1'.

c) Entity set A has two roles: role1 and role2 participating in a relationship.

d) Entity set A is existentially depending on Entity set B.

4. (a) Consider the following partial ER model as shown below. Assume that a course [Mark: 16]
    may or may not use a textbook, but can be used in several courses (at least 1). A course
    may not use more than five books. Instructors teach from two to four courses.
    Determine (min, max) mapping cardinality constraints on this diagram and **redraw** the
    ER model. *State clearly any additional assumptions you make.* (8 points)
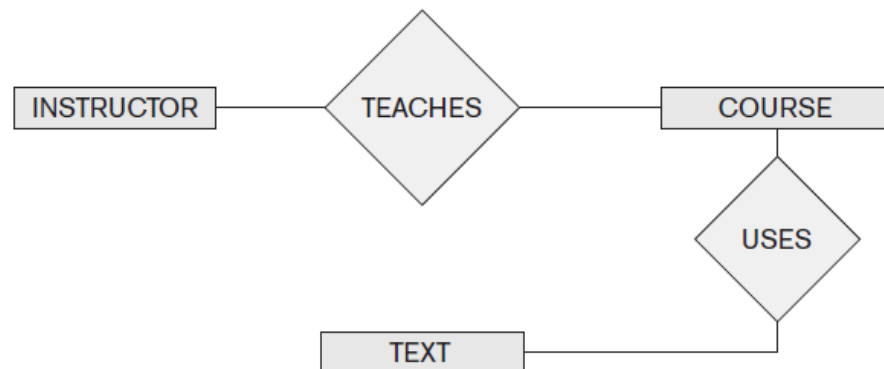
    (b) **Transform the ER model** you obtained in part (a), to a set of relations as per the
    example shown in Lab class using Data Modeler tool in SQLDeveloper. (8 points)

5. Consider the following scenario that contains information on a hotel and its guests. [Mark: 24]
    Your job is to design an ER model based on this scenario. Please note that the
    information is not complete, and you are free to make any reasonable assumptions.
    Your assumptions must be included in your answer.

    Guests reserve rooms in the hotel. A guest is described by a unique identifier, name,
    age, gender, and phone number. A room is characterized by a room number, room type
    (e.g., double, single), and the room rate per night. While making a reservation, the guest
    should provide expected check-in and check-out date.

    Each reservation must be associated with payments. A guest would pay an amount in
    advance to confirm room reservation, and the guest should pay the payment in full
    during check-out. Payment information must include a unique payment number,
    payment date and payment method (e.g., card, cash). Payments are made for a
    reservation and it existentially depends on the reservation.

    A staff of the hotel will be assigned to each reservation till the guest checks-out thereby
    ensuring happy and satisfied guests. A staff should have a unique identifier, name, age,
    phone number and number of working hours per week. At the time of check-out, the
    guest can provide feedbacks to the hotel management. A feedback must have a
    feedback identifier, feedback comment and customer satisfaction rating from 1 to 10.