EAST WEST UNIVERSITY
Department of Computer Science and Engineering
B.Sc. in Computer Science and Engineering Program
Theoretical Assessment II (Online), Spring 2021 Semester

Course:	**CSE 302 Database Systems**
Instructor:	**Mohammad Rezwanul Huq, PhD, Associate Professor, CSE Department**
Full Marks:	**100 (15 will be counted for final grading)**
Submission Deadline:	**Thursday, 06 May 2021, 11:59 PM**

Note: There are **7** (**SEVEN**) questions, answer ALL of them. Course Outcome (CO), Cognitive Level and Mark of each question are mentioned at the right margin.

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1. Consider the following schema diagram. [20]

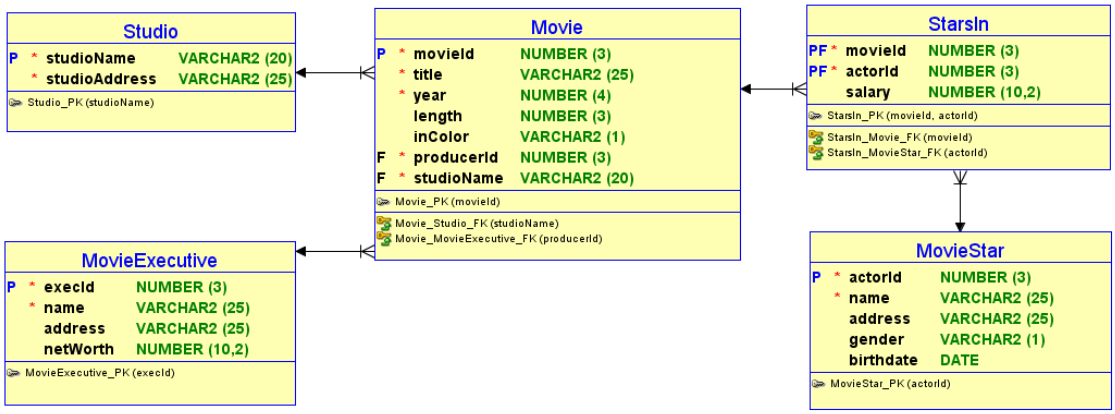


Figure 1: Schema Diagram for Question 1

Formulate SQL Statements to answer the following queries based on the schema diagram shown above.

a) 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.
b) Find the producer names of the movies of 'Harrison Ford' (actor). Write the statement using subqueries in FROM clause.
c) 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.
d) Find the actor name and address who was born after 1980 and earned more than at least one of the actors born after 1970.
e) Find actor name and gender who worked with all producers.
f) Find those movie titles which have the total salaries paid to its actors is more than the net worth of its producer.

2. Write the output of the following SQL statement based on the relational instance as shown in Figure 2. [10]

a) SELECT * FROM Department RIGHT JOIN Employee USING (deptId);

b) SELECT * FROM Department LEFT JOIN Employee ON Department.deptId = Employee.deptId;

Employee

empId	Name	deptId
E-101	Alice	D-001
E-102	Bob	D-002
E-103	Charlie	D-001
E-104	Douglas	D-002
E-105	Elton	D-005
E-106	Flintoff	D-006

Department

deptId	deptName
D-001	Accounts
D-002	HR
D-003	Marketing
D-004	IT
D-005	Logistics

Figure 2: Instance of Employee and Department for Question 2

3. a) Given a relation MovieStar (actorId, name, address, gender, birthdate), write SQL statement to create a view named 'StarMale' that includes actor id, name and address of the actors who are male and was born after 1960. [15]

b) What will happen when you execute the following SQL statement?
INSERT INTO StarMale VALUES (777, 'Sandra Bullock', 'California');

c) Suppose, the user 'Alice' was allowed SELECT privilege only on the view 'StarMale'. Alice has no other access on any database objects. Now, the user wants to create another view 'StarMaleLondon' which will contain the actor id and name of those actors who live in 'London'. Can she do that? If yes, write the SQL statement to create the view. Otherwise, explain your answer.

4. Consider the following authorization graph showing the users having `SELECT` privilege on the previously created `StarMale` view. [15]

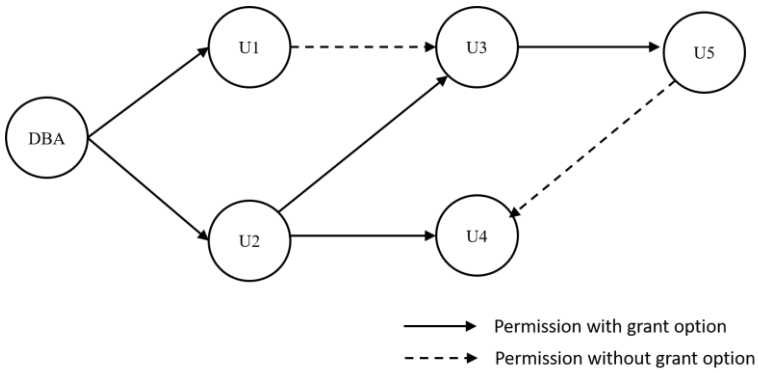


Figure 3: Authorization Graph for Question 4

a) If the user U2 executes the following SQL statement, what will be the output?

```
SELECT grantor, grantee, grantable
from user_tab_privs
where table_name = 'STARMALE';
```

b) If U2 revokes privilege from U4, does U4 still have access to the view? Draw the changed authorization graph in support of your answer.

c) If DBA revokes privilege from U2, does U5 still have access to the view? Draw the changed authorization graph in support of your answer.

5. Assume that you have two entity sets A and B. Using appropriate notations of ER model, express the followings: [10]

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.

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

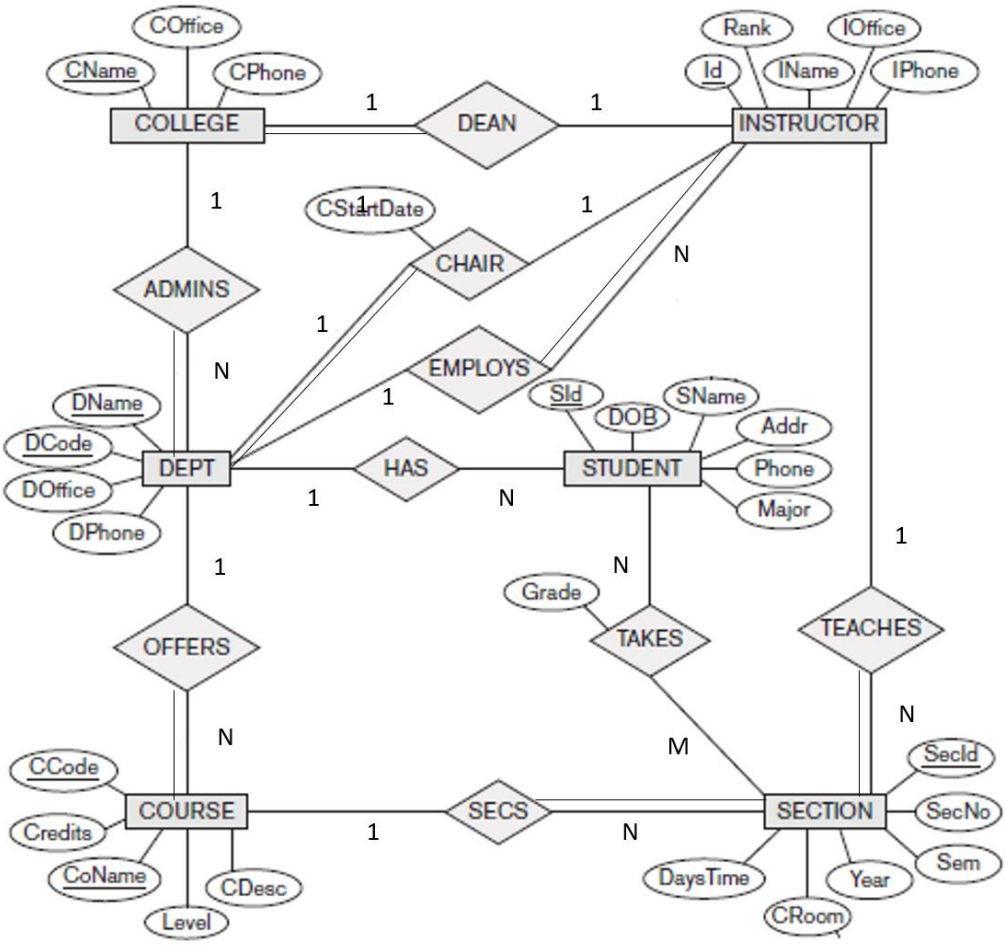
6. Consider the following scenario that contains information on a hotel and its guests. Your job is to build an ER model based on this scenario. Please note that the information is not complete, and you are free to make any reasonable assumptions. Your assumptions must be included in your answer. [20]

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.

7. **Reduce** the following ER model into a set of relational schemas. Justify your answer briefly. [10]



Please note that, in the diagram, ellipses represent simple attributes, dashed ellipse represents derived attributes and double ellipse represents multi-valued attributes. 1 indicates 'one' side and N indicates 'many' side in a relationship set.