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BBA (TM) 4th Semester 23 August 2019 (Afternoon)

ISLAMIC UNIVERSITY OF TECHNOLOGY (IUT)
ORGANISATION OF ISLAMIC COOPERATION (OIC)
Department of Computer Science and Engineering (CSE)

MID SEMESTER EXAMINATION **SUMMER SEMESTER, 2018-2019**

DURATION: 1 Hour 30 Minutes **FULL MARKS: 75**

CSE 4461: Computer Science and Technology II

Programmable calculators are not allowed. Do not write anything on the question paper.

There are **4 (four)** questions. Answer any **3 (three)** of them.

Figures in the right margin indicate marks.

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1. Consider the following database schema:

Actor *(act_id, act_firstname, act_lastname, act_gender)*
Director *(dir_id, dir_name, salary)*
Movie *(mov_id, title, year, release_date, budget)*
Casts *(act_id, mov_id, role)*
Direction *(dir_id, mov_id)*
Reviewer *(rev_id, rev_name)*
Rating *(mov_id, rev_id, stars)*

The underlined attributes are keys. *Actor*, *Director* and *Movie* table stores information about different actors/actresses, directors and movies. *Casts* table portrays which actor/actress acted in which movie. *Direction* table shows which director directed which movie. *Reviewer* and *Rating* tables store information about the reviewers and how many stars they gave to a movie.

a) Suppose all the tables have been created except *Movie*, *Casts* and *Direction*. Write DDL statements to create these tables. Make sure to include proper integrity constraints and references. 5

b) Write SQL statements to perform the following operations: 2.5×8

i. Find the year when the movie 'Avengers' was released.
ii. List all movie titles and their director names.
iii. Find all information of actors/actresses who have not acted in a movie. (Hint: 'Not In' clause)
iv. Find the names of the movies having 'The' in its title.
v. Find the title of the movie that has the maximum budget.
vi. Find the names of all directors who have a higher salary than at least one director.
vii. Find the title of the movies that got average rating of more than 7 stars. Sort the result in alphabetical order of titles.
viii. Delete all directors with salary less than 10,000.

2. a) Define *super key*, *candidate key* and *primary key*. Provide examples of each key using a single table. 6

b) What is the difference between writing SQL queries with **"natural join"** and **"inner join....on"** keywords? 5

c) From the database schema in Question 1, write an SQL statement to create a view *MovieDirector* which will include every director id along with the movies they directed. If any director did not direct any movie, include them in the list too. 3+3
What is the difference between this view and a materialized version of it?

d) Write appropriate SQL statements to create the following authorization graph shown in Figure 1. For each statement, identify which user will execute the command. Assume that you are only granting the SELECT privilege on *Movie* table based on the database schema 6+2

in question 1. Explain what happens in the context of Oracle Database when DBA revokes privilege from U1.

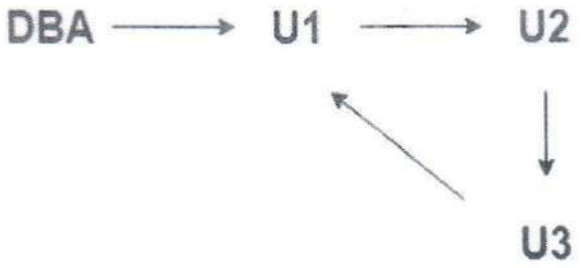

Figure 1: Authorization Graph

3. It is the year 2050. Due to massive advancement in technology, helicopters have become very cheap and accessible. Helicopter-pooling is accepted and promoted by people around the globe. In this system, pilots create a ride from one city to another based on the request of the users. As a young entrepreneur, you are on the verge of launching a helicopter-pooling app called **Uthao**. To create the app database, you need to model it. The initial requirements are as follows:
   - The app *Uthao* will record its app identity number, name of the CEO and budget.
   - The users need to register on the app providing name, contact no. and email. One user can have multiple phone numbers. The pilots also need to register providing similar attributes as user. The pilots can be of two types: 'Captain' or 'First Officer'. In the beginning, *Uthao* may not have any users but to start the business it must have at least one pilot.
   - *Uthao* has helicopters in its stock. Each helicopter has its own model no, color and year of built. The company must have at least one helicopter in its stock.
   - Each pilot is assigned a helicopter. A pilot can have from no helicopter up to at most one helicopter assigned to him/her.
   - The user rides with a pilot by requesting rides on the app. Ride information such as destination city, fare etc are recorded in the relation.
   - Every user will have preferences. For example, what type of music he/she likes, does he/she like to chitchat with the pilot, are pets allowed etc. These preferences can be same for different users. (Hint: preferences will have discriminators)

   a) Create an ER model based on the above mentioned specifications. Your ER model must be neat, concise and legible. 15

   b) Reduce the ER model that you have designed into a set of relations with proper justification. Identify the appropriate primary key for each relation. 10

4. a) What are the drawbacks of using file systems? Explain with examples. 9

   b) What is the difference between (a) and (b) in Figure 2? 3

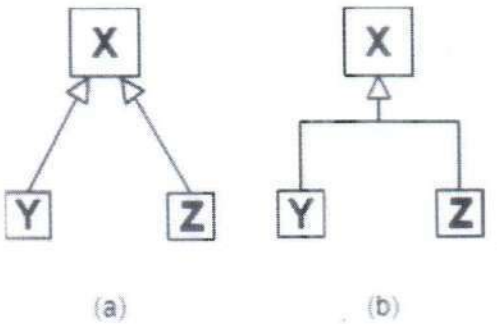

Figure 2: Figure for the question no. 4 (b)

c) Classify the constraints on generalization or specialization based on: 5
   i. Attribute of higher-level entity determines lower-level entity membership
   ii. Completeness

d) Describe appropriate scenarios where you can demonstrate the application of the following cardinalities: 2x2
   i. One-to-many
   ii. Many-to-many

e) BTM 17, as brilliant and as creative they are, have been the best students. They are thinking of opening a buy and sell website where IUTians can buy or sell different items. They have decided that they will call the website GOOD BUY. They will need a database to store all the information. To store product information, they will need a table named **"GoodBuy"** which will store product id, product names, expiry dates, product type and a **"Students"** table which will store student id, name, department, batch, contact no etc. 4
Write appropriate DDL statements to create the tables. Make sure to include proper integrity constraints.