University of Asia Pacific (UAP)

Department of Computer Science & Engineering

Mid-Semester Examination (Fall-2020)

Program: B. Sc. Engineering (2nd Year/2nd Semester)

Course Title: Database Systems Course Code: CSE 211 Credits: 3.00

Time: 1.00 Hour Full Marks: 60

There are **Three** Questions. Answer **all of them**. Figures in the right margin indicate marks.

1. The following relational schema form a company database which is implemented in a relational database:

   officer (o_ID, o_name, d_ID, salary)
   department (d_ID, d_name, floor)
   project (p_code, p_title, d_ID, hours)

   Write down the Relational Algebra operations for the following queries:

   a) Find salary using your own registration number as Officer's ID. 5

   b) Show the name of department where the floor number is equal to n. 5
   (here, n = the length of your own last name; you do not need to calculate the length using Relational Algebra, just calculate in your mind and put the value in the desired Relational Algebra operation)

   c) Find the project titles of the IT department. 5
   (ID of the Department of IT → 012)

   d) List the project titles having more than 40 hours but less than 90 hours. 5

2. The following relational schema form a company database which is implemented in a relational database:

   officer (o_ID, o_name, d_ID, salary)
   department (d_ID, d_name, floor)
   project (p_code, p_title, d_ID, hours)

   Write down the SQL for the following queries:

   a) Find name using your own registration number as Officer's ID. 5

   b) Show the ID of the department where the floor number is equal to n. 5
   (here, n = the length of your own first name; you do not need to calculate the length using SQL, just calculate in your mind and put the value in the desired SQL)

c) Find the project titles of the Sales department. 5
(ID of the Department of Sales → 007)

d) List the project titles having more than or equal to 30 hours but less than or equal to 80 hours. 5

OR

2. The following relational schema form a company database which is implemented in a relational database:

officer (o_ID, o_name, d_ID, salary)
department (d_ID, d_name, floor)
project (p_code, p_title, d_ID, hours)

Write down the SQL for the following queries:

a) Find the maximum salary for each department. 5

b) Show the name of department starting with "H" and ending with "s". 5

c) Find the project titles of the IT department using subquery. 5

d) Reduce the salary of the officers working in the Sales department by 15%. 5

3. Everyday a number of Client(s) visit(s) the Shopkeeper(s) of the ABC Toy Store with their respective Bab(y/ies), as the Shopkeeper(s) may sell one or more Toy(s) to the Client(s) for his/her Bab(y/ies). Client(s) always buy(s) four or more Toys from the Store every time, by paying the necessary amount to the Shopkeeper(s) directly. 20

Details of Shopkeeper(s) (S_ID, S_Name, S_Phone_Number), Client(s) (C_ID, C_Name, C_Phone_Number, C_Address) and Toy(s) (T_ID, T_Brand, T_Price) are required.

Based on this scenario, please draw the corresponding Entity-Relationship (E-R) diagram by mentioning the primary keys in the underline, with other necessary attributes, entity sets and relationship sets. Please note that, the records of the Bab(y/ies) are not stored via any of the attributes in the entity set of Client(s) for any type of cross-reference.