Department of Computer Science and Engineering
University of Dhaka
2nd Year 2nd Semester 2022 Lab Examination

One of the stakeholders of Dhaka University is employees of the organization. Employees are teachers, officers, 3rd class employees and 4th class employees. They have their own personal information including home division. These employees works in different departments, offices and hall offices and have different basic salaries, increment and promotion guideline. Many of the employees reside in the campus in different residential buildings and also in the hall accommodations. Some of the employees have cars of their own. Employees have different marital status (married, single, divorced) and may have child/children or not. Child/children of the employees are at different educational levels (primary, secondary and higher secondary, university etc). Most of them are students of nearby institutions of the Dhaka university specially at school/college levels and some of them are also students of Dhaka university.

The database does not limited to the said domain but you can assume more parameters and make the database richer. It is expected that your database should include composite, multivalued, derived, descriptive attributes and also week entity set

1. Design a database based on the above scenario and: **10**
   a) Consider appropriate datatype and length for each attribute.
   b) Identity **primary keys** and **foreign keys** for the respective tables.
   c) Draw the schema diagram.

2. Implement the following constraints and follow appropriate naming convention :   **2**
   a) 'cell_no' must start with '017' or '015' or '016'or '019' also must be unique attribute.
   b) 'basic' salary must be greater or equal to Tk 8,250 and less than or equal to Tk 78,000.
   c) 'division' must be any of the 7 divisions of Bangladesh
   d) Create a **check constraint** to ensure that 'blood_group' can hold only the valid blood groups.

3. Sketch E-R diagram for the database.   **4**

4. Insert necessary data in the corresponding tables.   **4**

5. Create a view **'emp_car'** to show the employee names, designation and their   **2**
   cars (name, brand, registration year etc) who reside in 'Shaheed Abul Khair Bhaban'.

6. Write query statements using SQLs for the following queries: **6**
   a) Find the names of the employees along with division and date of birth who belong to 'CSE', 'EEE' or 'FH Hall Office' offices and have at least 25 characters as their names.
   b) Find the number of employees and total salary for each workplace (department, offices or hall offices) where average salary of such workplace is greater than the minimum total salary among all the offices (use with clause).
   c) Find the information of the children with their parents who study in different department/institutes of the Dhaka university.
   d) Delete the residence information of the employees who have '125' in the 4th, 5th and 6th digits in their mobile numbers.

7. Write the following query using 'not exists' construct and 'outer join'.   **2**
   a) Find the employees who do not have any children.

8. Please provide a softcopy word/notepad document (**your_roll.file_ext**) of the following:
   a) Table creation snapshot (with keys, constraints etc.)
   b) Snapshot of table data
   c) SQL queries and snapshot of the query outputs
   d) Schema diagram and E-R diagram (Hardcopy)