

**ISLAMIC UNIVERSITY OF TECHNOLOGY (IUT)**

ORGANISATION OF ISLAMIC COOPERATION (OIC)

**Department of Computer Science and Engineering (CSE)**

MID SEMESTER EXAMINATION

SUMMER SEMESTER, 2022-2023

DURATION: 1 HOUR 30 MINUTES

FULL MARKS: 50

**CSE 4409: Database Management Systems II**

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

Answer all 3 (three) questions. Figures in the right margin indicate full marks of questions with corresponding COs and POs in parentheses.

1. a) How do you implement many to many cardinality? Explain with a suitable example. 2  
(CO1)  
(PO1)
- b) What is a Tablespaces? Mention one scenario where it is essential to bind tablespace to a specific table. 3  
(CO1)  
(PO1)
- c) "It is possible to convert each PL/SQL procedure into an equivalent function" Do you agree with the statement. Justify your position using suitable arguments. 4  
(CO1)  
(PO1)
2. Consider the following scenario:

Students of IUT are admitted in different programs of each department. Each student must have ID, Name, Date of Birth, CGPA, and his/her department/program information.

**Pocket Allowance Selection Policy:** Students are given a monthly Pocket Allowance (PA) of 50 US\$ which is reflected through an appropriate transaction containing the student's ID, amount, and date-time. The office of the registrar maintains disciplinary record for each student which may include short description of the event and date-time. By default, a student gets PA each month. But if he/she has a CGPA  $\leq$  2.25 and has 3 or more disciplinary events recorded in the last 6 months, then the student is disqualified from getting PA. The university also provides internet service of 100 hours per month for each student. Beyond this limit, charge will be applied as follows:

- Day Scheme: The charge from 6:00 upto 18:00 is 0.10 US\$ per minute.
- Night Scheme: The charge from 18:01 upto 5:59 is 0.25 US\$ per minute.

Starting time of a specific internet connection will be the deciding factor for its specific scheme. In both cases, 1 minute pulse is considered (i.e., 1 minute 12 seconds will be considered as 2 minutes). Instead of paying separately, the bills (if any) are adjusted with their PA ( i.e., deducted).

Your tasks are as follows:

- a) Create the required table(s) maintaining standard database design principles. 10  
(CO3)  
(PO3)
- b) Write a PL/SQL function as follows: 8  
(CO1)  
(PO1)

**Input:** ID, Current Date-Time

**Output:** Yes/No

**Algorithm:** It determines if the student is allowed to receive PA as per the policy

c) Write a PL/SQL function as follows:

**Input:** ID, Current Date-Time

**Output:** Amount of total bill

**Algorithm:** It calculates total bill for given student for the given month as per the policy.

8  
(CO1)  
(PO1)

3. Consider the scenario of Question 2 again with following additional information:

The university introduces a scholarship having a total amount of "X" US\$ which will be distributed among the students as per the following policy:

**Scholarship Selection Policy:** Students having  $CGPA \geq 3.25$  and having no disciplinary record will be initially selected. Then priority will be given bases on CGPA only. Additionally, each student will receive an amount of "Y" US\$ which will be materialized by another transaction similar to PA transaction. The process will continue as long as the fund is available. So, it can not guarantee that all initially selected students will avail it.

a) Write a procedure in PL/SQL to automate the Scholarship Disbursement Process as outlined.

10  
(CO3)  
(PO3)

b) What is the basic benefit of using %TYPE? Differentiate between implicit and explicit cursor.

5  
(CO1)  
(PO1)