B.Sc. Engg. / HD CSE 5th Semester (65) 9 March 2017 (Afternoon)

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

MID SEMESTER EXAMINATION **WINTER SEMESTER, 2016-2017**
DURATION: 1 Hour 30 Minutes **FULL MARKS: 50**

CSE 4507: RDBMS Programming

Programmable calculators are not allowed. Do not write anything on the question paper.
There are **4 (four)** questions. Question **No. 4 is mandatory.** Answer any **2 (two)** from the remaining questions. Figures in the right margin indicate marks.

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1. a) What is the basic difference between a table and a view? What added advantages do they ensure? Explain with suitable example. 4
   b) What is cardinality? Create appropriate scenarios where you can demonstrate the application of the following cardinalities: 8.66

      i. one-to-one ii. one-to-many and iii. many-to-many

      Also present appropriate DDLs for each of the relationships.
   c) What is data dictionary? Mention few information a data dictionary stores. 4

2. a) What is the difference between inner join and outer join? What is full outer join? How can you write full outer join using Oracle old syntax? Explain with suitable examples. 4.66
   b) Present a comprehensive discussion about the inter-relationship among tablespace, datafiles and objects. 4
   c) Consider the following table definition: 4×2

```
SQL> desc employees;
 Name                                      Null?    Type
 ----------------------------------------- -------- ------
 EMPLOYEE_ID                               NOT NULL NUMBER(6)
 FIRST_NAME                                         VARCHAR2(20)
 LAST_NAME                                 NOT NULL VARCHAR2(25)
 EMAIL                                     NOT NULL VARCHAR2(25)
 PHONE_NUMBER                                       VARCHAR2(20)
 HIRE_DATE                                 NOT NULL DATE
 JOB_ID                                    NOT NULL VARCHAR2(10)
 BASIC_SALARY                                       NUMBER(8,2)
 COMMISSION_PCT                                     NUMBER(2,2)
 MANAGER_ID                                         NUMBER(6)
 DEPARTMENT_ID                                      NUMBER(4)
 LOCATION                                           VARCHAR2(20)
```

Write down the following 2 queries:

i. *Find out the first names of top 5 employees who work more than 3 years and the first name contains at least 8 characters and the first name must have at least 2 consecutive 'L's (i.e. ignore case). The order should be based on total experience (i.e. the most senior should come first).*

The sample output:

Serial	Name	Experience (in Years)
01	Abdullah1	9.2
02	Abdullah2	7
03	Abdullah3	5.3
04	Abdullah4	4.3
05	Abdullah5	3.2

ii. Total salary for a particular employee is calculated as follows:

House rent is 40% of the basic salary. Transport allowance is 10% of the basic. Excellence bonus is 200% of the COMMISSION_PCT (if it is found).

Total Salary = House rent + Transport allowance + Excellence bonus

Now write an SQL to list all employees along with their first name and total salary (in decreasing order of the salary). [Note: some values of the salary may be missing due to some reasons.]

3. a) Use suitable example to explain the difference between cube and rollup operators in group by clause. 4
   b) What is block in PL/SQL? Present an example in this regard. 2
   c) What is the basic difference between FUNCTION and PROCEDURE in PL/SQL? *"Any FUNCTION can be converted to its equivalent PROCEDURE"* - Justify with a suitable example. 4
   d) Consider the following entities: Underlined *attribute is the primary key.* 6.66

- Citizen <ID, Name, DOB, Address>
- TaxPaid<CitizenID(FK[Citizen]), AmountPaid, DatePaid>

Write down an anonymous block to assess the status of a particular citizen. The citizen id is initialized to 101. Its status be printed in the screen. Status is evaluated as follows: If the citizen paid a total tax above TK. 10000 between January 1, 2010 and December 31, 2014 then the status is VIP. If the paid amount is between 10000 and 8000 then it is BUSINESS. Otherwise it is NORMAL.

4. **[Mandatory]**

Consider the following table definitions:

NOTE: PK implies Primary Key. FK[X] implies Foreign Key referencing table X.

```
1. Dept < ID (PK), NAME >
2. Prog < ID (PK), NAME ,DID(FK[Dept])>
3. Courses <ID (PK), NAME , Credit>
```

4. Students < ID (PK), NAME, DEPT (FK[Dept]), PROG (FK[Prog]), DOB,
AY, SEMESTER, GPA (must be between 0 to 4)>
5. Results < Student_ID, Course_ID, AY, Sem, Letter_Grade>
6. Grades_Explained <Letter(PK), num_value (it must be between 0 to 4)>

a) Create DDLs for the above tables.
b) Write SQL for the followings: 6

i. For a given student ID, find out the department name, program name and all courses he has completed along with the letter grade. 3×2

ii. Find out the list of students ID, Name who obtained GPA higher than the average GPA of any department (i.e. average GPA of the department that has the lowest CGPA among all departments).

c) Write a subprogram to meet the following requirements: 4.66

Input: Student ID

Output: Status

Algorithm: Find his current AY and Sem from `Students` table. He is PASSED if no grade is F. If there are F grades for 1 or 2 courses then he is REFERRED. If there are 3 or more F grades then it is FAILED.