B.Sc. Engg. / HD CSE 5th Semester (58) 07 May 2012 (Morning)

ISLAMIC UNIVERSITY OF TECHNOLOGY (IUT)

ORGANISATION OF ISLAMIC COOPERATION (OIC)

Department of Computer Science and Engineering (CSE)

SEMESTER FINAL EXAMINATION **WINTER SEMESTER, 2011-2012**

DURATION: 3 Hours **FULL MARKS: 100**

CSE 4507: RDBMS Programming

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

There are **8 (Eight)** questions. Answer any **6 (Six)** of them.

Figures in the right margin indicate marks.

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1. a) We know that, the native compilation mode is 30% faster in execution than the default interpreted mode. Why do we need the interpreted mode? Justify your answer. 4

   b) What are bind variables? Demonstrate the advantages of using bind variables with the help of a sample code. 6

   c) What is a trigger? Write down the order of DML trigger firing. 4

   d) Can you suggest any way by which a procedure can return a value in PL/SQL? Explain with an example. 2.66

2. a) Examine the following code and correct it if needed. In addition, provide your explanation for each correction made. 8

```
CREATE FUNCTION _MYFUNCTION(P_ID NUMBER(3,0)) RETURN NUMBER AS
DECLARE
V_ID OUT NUMBER=100;
BEGIN
P_ID=P_ID/2;
RETURN (V_ID + P_ID/2);
END;
```

   b) Consider the following table: 8.66

Table Name: **Faculty_Master**

Column Name	Data Type	Size
ID	VARCHAR2	50
Name	VARCHAR2	50
Date_of_birth	VARCHAR2	50
Department	VARCHAR2	50
Post	VARCHAR2	50
Joining_Date	DATE	
Basic_Salary	NUMBER	10,2
Incr	NUMBER	10,2
Primary Key: ID		

Write a procedure in PL/SQL that will receive an ID as a parameter and then print the name, age and total salary of that person. To calculate the total salary, use the following formulas:

Total_salary = **Net_Salary** + 40% of **Net_Salary**

Net_Salary = **Basic_Salary** + (Years between joining date and current date * **Incr**)

3. a) Consider the table **Faculty_Master** in the question 2.b). Suppose, the table contains 100 records. Is it possible to change the datatype of the column **Date_of_birth** from **VARCHAR2 (50)** to **DATE** without losing any record? If so, write the sequence of SQL or PL/SQL code to perform this action. 10

b) *"A cursor is a pointer to records in the database"* – Do you agree with this opinion? Justify your answer. 4

c) Write a simple PL/SQL block that will print the following string: 2.66
'Colorado's "National Park" is one of the world's most beautiful parks.'

4. a) Create a PL/SQL function named **check_record**, which will return true if the **Faculty_Master** table in 2.b) has at least one record. Otherwise, it will return false. 3

b) When the following code will cause an error? Explain your answer. 3

```
DECLARE
VAR Author_Info%ROWTYPE;
BEGIN
SELECT * INTO VAR FROM Author_Info WHERE First_Name IS LIKE 'A%';
END;
```

c) Name the three ways to define records in PL/SQL. 2

d) Consider the table in the question 2b). Assume that, the table has 10 records. Now, write a PL/SQL block that will print the list of **ID, Name,** and **Age** of each faculty sorted in ascending order according to their age. 8.66

5. a) Consider the following PL/SQL code segment: 4

```
CREATE TRIGGER    STUDENTS
---
---
--- END OF TRIGGER CODE;
```

Assume that, **STUDENTS** is already a name of an existing table of the same user. Consider the code (which is not shown here) for this trigger is correct. Explain the outcome.

b) What are the differences between **CHAR** and **VARCHAR**? Consider the **Faculty_Master** table in the question 2.b). Now, define a trigger on this table that will insert a NULL value in the **Date_of_birth** column, if the user tries to insert a date higher than the current system date. In addition, insert the corresponding faculty **ID** provided by the user into a log table. 7.66

c) Briefly describe the statement processing modes available in PL/SQL 5

6. a) Find out and explain why the following code will produce an error. Also provide a solution of the problem. 5

```
DECLARE
TYPE V_TYPE IS VARRAY(3) OF PLS_INTEGER;
VAR V_TYPE:=V_TYPE();
DECLARE
VAR(1):=100;
DBMS_OUTPUT.PUT_LINE(VAR(1));
END;
```

b) Explain how we can use VARRAYS in database tables with examples of creating table columns having VARRAY type, inserting and retrieving values. 8

4. a) Suppose you have already trained a Back Propagation Network (BPN) so that all connection weight are adjusted. Describe how you can predict class label for a new test data. 12

b) Explain the method of weight adjustment of interconnections in BPN. 13

5. a) Why the Support Vector Machine (SVM) is called large margin classifier? 10

b) Explain the mechanism behind SVM with Gaussian kernels. 15

6. Suppose you have the following document term index:

d1:	1	2		
d2:	1	3	4	5
d3:	2	3	4	6
d4:	1	2	3	4
d5:	1	2	3	6

where $D_i = i^{th}$ Document and 1,2,3,4,5,6 are terms present in documents.
d1: 1 2 means Document 1 (d1) contains term 1 and 2.

a) Apply an agglomerative clustering procedure to the collection. Consider the Dice's coefficient measure as a measure of similarity between documents, 20

$$D(d_i, d_j) = 2\frac{|d_i \cap d_j|}{|d_i| + |d_j|}$$

b) Draw the resulting Dendogram. 5

7. a) Determine the clusters in the following data set, using K means clustering algorithm: 20

Object	attribute 1 (X): weight index	attribute 2 (Y): pH
Medicine A	1	1
Medicine B	2	1
Medicine C	4	3
Medicine D	5	4

b) What are the strength and weakness of K means clustering algorithm? 5

8. a) Draw the diagram of a neural network that solve XOR problem. 10

b) Explain the mechanism behind Anomaly detection algorithm. 15