



ST. XAVIER'S COLLEGE
KOLKATA
(AUTONOMOUS)

1st SEMESTER EXAMINATION
JANUARY – FEBRUARY 2021
M.Sc. COMPUTER SCIENCE

CMSM4156

Saturday, January 09, 2021

12:00 PM to 3:00 PM

3 hours

Full Marks : 80

LABORATORY 1: PL/SQL AND
OS PROGRAMMING LAB

PLEASE READ THESE INSTRUCTIONS BEFORE YOU START WRITING:

1. Of the questions attempted, the answers to only the first required number of questions (as stipulated in the question paper) will be evaluated. **So please do not attempt extra questions.**
2. Use fountain pen or ball-point pen of **blue or black ink.**
3. Write (**not type**) the answers legibly, in your own words as far as practicable, on A4 size sheets.
4. Save the pages of your answer sheets (hand-written document) to a single PDF file and name the document accurately i.e. **Roll No_Paper Code.PDF** (example: 147_PH36141T).
5. Send the PDF file to the following email address **within 30 minutes of the completion of the examination: cmsm4156@sxccal.edu**
6. In the subject field of your email, please write "**Answer Script – Roll No, Paper Code**" (example: "Answer Script – 147, PH36141T").
7. The scanned answer scripts should have **enough clarity** to enable evaluation.
8. On top of each page **handwrite** the following information: **Name, Roll Number, Paper Code , Date, and Page Number**
9. No multiple submissions would be allowed.

The marks are given in **brackets ()** at the end of each question or part question.

The question paper consists of **3** pages.

Of the questions attempted, the answers to only the first required number of questions (as stipulated in the question paper) will be evaluated.
So, PLEASE DO NOT ATTEMPT EXTRA QUESTIONS.

GROUP A

(Instructions: Students should take the screen shots of the table(s) created, and the output of the results after running the queries & attach it with (SQL/PL/SQL) code. [in pdf format])

ANSWER QUESTION 1 AND ANY 2 FROM THE REST.

1. Answer ANY TWO

(5×2=10)

- a) Write a Function FAREA to calculate the Area of a Square or Area of a Circle. It accepts a number and a character parameter. The character parameter is either 'C' to compute area of a Circle or 'S' to compute the Area of a Square. Raise an Exception in case of invalid input.
- b) Write a PL/SQL code to store the first n positive integers along with their cubes in an already created table. 'n' should be taken as an input from the user. The program will also display the output of the table.
- c) Write a PL/SQL code to create a table called **prime_num** which will store all the prime numbers within a given range, where n is to be taken as an input from the user.
(e.g., If a user gives 100 as the input, then all prime numbers from 1-100 should be stored in the table *prime_num*)

2. Create the following tables with *proper integrity constraints*:

Emp (e_id, e_name, e_sal, d_id)

Dept (d_id, d_name, d_location)

Every employee id must begin with 'EOM', the salary range of an employee should be between 15000 and 150000, and the departments are in one of the following locations: *Kolkata, Chennai, Bangalore*, and *Gurgaon*. Insert at least 5 records in each table. **[5]**

- i) Write a PL/SQL code using Cursor to increase the salary of all the employees of Chennai by 15% and decrease the salaries of employees residing in Gurgaon by 5%, setting the maximum and minimum ceiling as given.
- ii) Write a procedure/function to input the id (e_id) of an employee and return the corresponding employee details. Use proper Exception Handling in case of invalid data input. **[5+5]**

3. Create the following Tables maintaining **proper Integrity Constraints.**

Student (s_roll, s_name, s_address, c_id)

Course (c_id, c_name, c_fees, c_startdate)

Insert at least 5 records in each table. Keep proper validation so that the value of course fees (c_fees) lies between 5000-50000 and the c-id starts with the letters 'CR'. **[5]**

- a) Write a PL/SQL code using cursor to increase the course fees of the course '*Python Programming*' by 10% and other courses by 5%. Ensure that the updation is properly done within the validation limit.
- b) Write a procedure/function to input the c-id of a Course and return the Course details. Use proper Exception Handling in case of invalid data input. **[5+5]**

4. Create a table named ***Employees*** to store the detailed information of the employees in an organization. The table should contain the following fields:
(Eid, Ename, EDept, DOJ, ESal)
- Insert at least 15 records.
- a) Write a PL/SQL code to increase the salary of all Employees by 20% whose number of experiences (in years) is greater than or equal to 20 and others by 10%.
- b) Write a PL/SQL code to separately store the records of the first 5 employees having the maximum salary in a separate table named ***Max_sal***. and last 5 employees having the minimum salary in a separate table named ***Min_sal***.
- c) Write a procedure/function to input the Eid of an employee and return the employee details. Use proper Exception Handling in case of invalid data input. **[5+5+5]**

GROUP B

(Instructions: Please provide source code wherever applicable)

ANSWER QUESTION 5 AND ANY TWO FROM THE REST.

5. Answer **ANY TWO** of the following:
- a) Write a C program using OpenMP features to find the sum of the following series:
 $1^2 + 2^2 + 3^2 + \dots + n^2$ ('n' should be input by the user) **[5]**
- b) Write a C program using Linux System calls to display the contents of a text file, "sample.txt". **[5]**
- c) (i) Explain the role of the 'sections' clause in OpenMP.
(ii) How does the execve() system call of Linux work? **[2.5+2.5]**
6. a) Write a C program using Linux System calls to create a child process. The child process should display current system date. The parent should terminate only after the child.
- b) Write a C program using OpenMP features to create two parallel threads. One thread should push an element into a stack, whereas the other should pop an element from the same stack. **[7.5+7.5]**
7. a) Write a C program using Linux System calls to open a text file, "sample.txt". The program should then count the number of vowels present in the file along with its size and display the same.
- b) Write a C program using OpenMP features to create two parallel threads. One thread should insert an element into a queue, whereas the other should remove an element from the same queue. **[7.5+7.5]**
8. a) Write a C program using Linux System calls to create a child process. The child process should create a text file, "sample.txt" by accepting input from the user. The parent should display the contents of the file, "sample.txt" created by the child.
- b) Write a C program using OpenMP features to find the sum of two matrices in linear time. **[7.5+7.5]**
