



**ST. XAVIER'S COLLEGE**  
**KOLKATA**  
**(AUTONOMOUS)**

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

**CMSM4157**

Friday, January 22, 2021

12:00 PM to 3:00 PM

**3 hours**

**Full Marks: 80**

**LABORATORY 2: OBJECT  
ORIENTED PROGRAMMING  
LAB**

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**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: CMSM4157@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.

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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.**

ANSWER **QUESTION NO. 1** AND **ANY FOUR** FROM THE REST.

1. Answer **ANY FOUR** **[5×4=20]**
  - a) In Java how does Unicode character-set differs from ASCII?
  - b) What do you mean by yield() method in Java Threads?
  - c) In Java, State the difference between Error and Exception.
  - d) What is a daemon thread and how is it implemented in Java?
  - e) What is the difference between String and StringBuilder class?
  - f) State the difference between path and classpath with respect to packages in Java.
  
2. Write a Java program to create two threads – one thread will input an integer and will find its factorial and another thread will input another integer and will display all its prime factors. **[15]**
  
3. Write a Java program to do the following:  
Create a class called Book which will store different information (like book name, author name, number of edition etc.) related to the books. Save this class in a package called BookInfo. Write another class called Library which will inherit Book class and store the number of copies purchased for each book and book lending information. Store this class in a separate package called Lib. Perform different input/output operations on these classes. **[15]**
  
4. Write a Java program to check whether all the strings passed as command line arguments are unique or not. If any duplicate string is present, raise a user-defined exception. Also find the frequency of the words starting with any vowel present in a set of words passed as command line arguments. **[15]**
  
5. Write a Java program to do the following:
  - i. Accept a sentence as in command line.
  - ii. Display the accepted sentence.
  - iii. Input a word from the user.
  - iv. Replace each occurrence of a particular word from the accepted sentence by the newly input word.
  - v. Display the modified sentence along with the positions where modifications have been done.**[15]**
  
6. Write a Java program that creates an abstract class called 'Number'. This class holds an integer as its data member and a suitable method to initialize it. This class also contains an abstract method called displayNum( ). Create two derived classes called 'HexNum' and 'OctalNum' that inherit 'Number'. Override displayNum ( ) in the derived classes so that it displays the value in Hexadecimal and Octal, respectively. Write a main ( ) function to create objects of type 'HexNum' and 'OctalNum' classes and display the hexadecimal and octal form of the supplied integer value. Use dynamic method dispatch feature to execute the program. **[15]**
  
7. Write a Java program to create three threads using Runnable interface. Execute the threads from the main program by changing their default priorities. Implement the uses of sleep( ) and stop( ) also. **[15]**

### Instructions:

1. You have to implement the Java programs each carrying 15 marks.
2. You have to send the code of the Java programs along with the output of the Java programs (Take multiple **screen shots (at least 2)** of the outputs of each Java Program).
3. Different files should be sent in the form of **.zip** (put the files in a folder and send the zip file of that folder (converted by you before sending)).
4. While sending a zip file, make sure that your file name is your Roll Number (e.g. if your roll no. is 550 then file name should be **550.zip** .. and if it is 5001 then **5001.zip**)
5. Send email with attached file **only once** . .... Multiple copies may lead to cancellation of your script.

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