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Uni. Roll No. ....

Program: B.Tech. (Batch 2018 onward)

Semester: 5

Name of Subject: Programming in Java

Subject Code: PCIT-109

Paper ID: 16440

Scientific calculator is Not Allowed

MORNING

11 MAY 2023

**Time Allowed: 03 Hours**

**Max. Marks: 60**

**NOTE:**

- 1) Parts A and B are compulsory
- 2) Part-C has Two Questions Q8 and Q9. Both are compulsory, but with internal choice
- 3) Any missing data may be assumed appropriately

**Part – A**

**[Marks: 02 each]**

**Q1.**

- a) List and define the three OOPs principles.
- b) List at least two functionalities of 'super' keyword.
- c) What is the role of bitwise operators?
- d) Briefly discuss how to import packages.
- e) Assume Box is class (with two instance variables length and breadth), what do you think the following code fragment does?  
Box b1= new Box( ); Box b2=b1;
- f) Justify the role of 'StringBuffer' class

**Part – B**

**[Marks: 04 each]**

- Q2.** With the help of program, explain the concept of explicit conversion.
- Q3.** Briefly discuss with the help of diagram phases involved in execution of a source code.
- Q4.** With the help of a program, demonstrate command line arguments.
- Q5.** "Interfaces can be extended", substantiate this statement by developing a suitable code fragment.

- Q6. Design a code to handle **ArrayIndexOutOfBoundsException**, **ArithmeticException**, **NullPointerException** exceptions. There should also be an exception handler available for any user defined exception.
- Q7. Design an applet based code to draw a bar chart for the runs scored by a cricket player in 6 one day matches.

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**Part – C**

**[Marks: 12 each]**

- Q8. a) Compare recursion with iteration.  
b) Compare overloading with overriding.

OR

Write a menu driven code using methods to handle following:

1. Start counting from the input number incrementing the value by 1 for each iteration.

The counting stops once the current value is divisible by 10.

2. Find the count of factors for a given number. For example, the factors of 10 are 1,2,5,10 and count in this case is 4.

- Q9. a) Design code to swap two numbers without using a third variable with the help of bitwise operators.  
b) Design a package to contain the class Student that contains data members such as name, roll number and another package contains the interface Sports which contains some sports information. Import these two packages in a package called Report which process both Student and Sport and give the report.

OR

- a) Write a program to demonstrate inter-thread communication.  
b) Design a code to handle multiple exceptions. The code must use concept of built-in and custom exceptions. Assume suitable data and run-time cases.

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