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**KIRIRI WOMENS' UNIVERSITY OF SCIENCE AND TECHNOLOGY**  
**UNIVERSITY EXAMINATIONS, 2024/2025 ACADEMIC YEAR**  
**SECOND YEAR, FIRST SEMESTER EXAMINATION**  
**FOR THE DEGREE OF BACHELOR OF SCIENCE IN COMPUTER SCIENCE**  
**(SPECIAL EXAMINATION)**  
**KCS 200 OBJECT ORIENTED PROGRAMMING II**

**Date: 15<sup>TH</sup> AUGUST, 2024**

**Time: 8:30 AM – 10:30 AM**

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**INSTRUCTIONS TO CANDIDATES**

**ANSWER QUESTION ONE (COMPULSORY) AND ANY OTHER TWO QUESTIONS**

**QUESTION ONE COMPULSORY (30 MARKS)**

- a) Differentiate between recursive functions and iterative functions. (4 Marks)
- b) State the syntax for the for loop (4 Marks)
- c) Differentiate between local and instance variables in java (4 Marks)
- d) Explain the following access modifiers as used in java (6 Marks)
  - i. private,
  - ii. protected
  - iii. public
- e) Design a class program for a Book. The class consist the following member variables: Book-title, author, publisher and ISBN-number. The methods include: *getAuthorDetails()* (for initializing the author's details) and *BookDetails()* (for printing the Book details on the screen). The class contains one object *MyBook*. (6 Marks)
- f) Describe any three rules for java identifiers (6 Marks)

**QUESTION TWO (20 MARKS)**

- a) Define the following terms (6 Marks)
  - i. Objects
  - ii. Class
  - iii. Method overriding
- b) Describe the three types of programming errors in JAVA (6 Marks)
- c) Write a program that prompts the user to enter the radius of a circle, then computes and outputs the area and circumference of the circle ( $\text{Area} = p * \text{radius}^2$ ,  $\text{Circumference} = 2 * \text{radius} * p$ ). (8 Marks)

**QUESTION THREE (20 MARKS)**

- a) Explain the following terms as used in object oriented programming (6 Marks)
- a) With an example explain the “switch” statement as used in Java (6 Marks)
- b) Demonstrate the use of the for loop to write a complete that would calculate the sum of the even integers from 2 to 200 and display the results (8 Marks)

**QUESTION FOUR (20 MARKS)**

- a) Differentiate between while loop and for loop. (4 Marks)
- b) Using the knowledge of Scanner class, write a complete program that calculates and prints the average of three integers entered from the keyboard (8 Marks)
- c) Explain primitive data types with the aid of relevant examples in Java (8 Marks)

**QUESTION FIVE (20 MARKS)**

- a) Explain the difference between switch case and if...else statements. (4 Marks)
- b) Describe what methods are and how are they defined in java (6 Marks)
- c) Use an if-else statement to write a program in Java that awards students grades based on the following guidelines; A = 70-100, B = 60 – 69, C = 50-59, D = 40-49, F = 0-39. The program should request the user to input the mark attained by the student, and should return “an invalid input” error in case the user tries to input any value that is not in the range 0-100 (10 Marks)