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KIRIRI WOMEN'S UNIVERSITY OF SCIENCE AND TECHNOLOGY
UNIVERSITY EXAMINATION, 2024/2025 ACADEMIC YEAR
FIRST YEAR, SECOND SEMESTER EXAMINATION
FOR THE BACHELOR OF SCIENCE IN COMPUTER SCIENCE
KCS 102 – OBJECT ORIENTED PROGRAMMING I

Date: 08TH April 2024
Time: 2:30PM – 4:30PM

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTION ONE (COMPULSORY) AND ANY OTHER TWO QUESTIONS

QUESTION ONE (30 MARKS)

Object-oriented programming principles provide a robust foundation for designing and implementing complex software systems like the online bookstore management system. By adhering to the pillars of OOP and applying key concepts like abstraction, encapsulation, inheritance, and polymorphism, developers can create scalable, maintainable, and reusable software solutions.

- a) Explain the following concepts used in object-oriented programming.
- i) Object (2 Marks)
 - ii) Class (2 Marks)
 - iii) Encapsulation (2 Marks)
 - iv) Inheritance (2 Marks)
 - v) Polymorphism (2 Marks)
 - vi) Abstraction (2 Marks)
- b) Explain the significance of these statements in a C++ program in object-oriented programming
- i) `#include <iostream>` (3 Marks)
 - ii) `Int main ()` (3 Marks)
 - iii) `Cout: "This is Programming class \n";` (3 Marks)
 - iv) `Return 0;` (3 Marks)
- c) Discuss the Three benefit of inheritance in object orientated programming language (3 Marks)
- d) Discuss the three roles of interfaces in achieving code modularity and extensibility in Objecct oriented programming. (3 Marks)

QUESTION TWO (20 MARKS)

- a) Describe key features of object-oriented programming languages (6 Marks)
- b) Discuss the difference between abstract classes and interfaces and why you would choose one over the other in OOP design. (2 Marks)
- c) Describe the two use of Aggregation in object oriented Programming (2 Marks)
- d) Describe three key interface components in OOP (6 Marks)
- e) Provide three real-world examples of using interfaces to define contracts in OOP (4 Marks)

QUESTION THREE (20 MARKS)

- a) Discuss five key pillars of OOP applications. (10 Marks)
- b) Develop C++ code for the following activities:
 - i) Determine the sum of two numbers. (3 Marks)
 - ii) Calculate product of four numbers (3 Marks)

iii) Calculate the Rectangle's Area.

(4 Marks)

QUESTION FOUR (20 MARKS)

- a) Discuss the three roles of interfaces in achieving code modularity and extensibility. (6 Marks)
- b) Explain the control structures used to implement logic in C++ programs. (4 Marks)
- c) Discuss five benefits of object-oriented programming (OOP) in C++ (10 Marks)

QUESTION FIVE (20 MARKS)

- a) Identify the three main types of translators in Object oriented Programming (3 Marks)
- b) Explain the definition of variable and the three rules for naming variables in C++. (6 Marks)
- c) Describe two types of comments in C++. (4 Marks)
- d) Discuss four advantages of high-level languages over lower-level languages. (8 Marks)
- e) Describe four types programming language classifications using relevant examples. (6 Marks)