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UNIVERSITY EXAMINATIONS

2022/2023 ACADEMIC YEAR

SUPPLEMENTARY/SPECIAL EXAMINATIONS

SECOND YEAR SECOND SEMESTER

FOR THE DIPLOMA IN

(INFORMATION TECHNOLOGY)

COURSE CODE: DIT 077

COURSE TITLE: OBJECT ORIENTED PROGRAMMING

DATE: 11/08/2023 **TIME:** 11.00 AM – 1.00 P.M

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTIONS ONE AND ANY OTHER TWO.

QUESTION ONE (COMPULSORY) [24 MARKS]

a) i) Outline three typical steps of writing an object-oriented program. [3 marks]

   ii) Explain **two** advantages of OOP over structured programming. [4 marks]

b) Explain the meaning of type casting as used in Java Programming. [2 marks]

c) Write an object-oriented program in Java that would accept the dimensions of a right-angled triangle, determine and output its perimeter. Use appropriate data members and one function member. [6 marks]

d) Explain the terms state and behavior as used in OOP. [4 marks]

e) Differentiate between mutator and accessor methods as applied in OOP. [4 marks]

f) Under what circumstance do we apply the data type class in OOP? [1 mark]

QUESTION TWO [18 MARKS]

a) Write a java program that will create a class named *marks* with the following properties:

   - A data member named scores which is an array of 6 elements;
   - A member method named mean for inputting the marks, calculating the mean and outputting the mean score.

   [6 marks]

b) Evaluate the following Java statements:

   i.   K=6*5/ (5%3); [3 marks]

   ii. 78>= (128%20); [3 marks]

c) Explain any THREE unique features of Object-Oriented Programming. [6 marks]

QUESTION THREE [18 MARKS]

a) Write a Java Program that uses an overloaded method named *calculate* to determine the area or volume of rectangular objects based on the number of parameters provided. The program should determine and output area or volume appropriately for Object1(12,8) and Object2(6,5,4). [10 marks]

b) Explain **TWO** types of Variables scope supported by Java. [4 marks]

c) With the aid of a flow chart, differentiate between while loop and do...while loop. [4 marks]

QUESTION FOUR [18 MARKS]

a) Explain the following terms as used in OOP:

    i.   Constructor   **[2 marks]**

    ii. Destructor   **[2 marks]**

b) What is the effect of the key word final on a:

    i.   Variable.   **[2 marks]**

    ii. Class.   **[2 marks]**

    iii. Method.   **[2 marks]**

c) Write a Java program that implements a class with the following properties: **[8 marks]**

- Data members as a, b, and c i.e., principal amount, interest rate p.a, and number of years respectively that are initialized as 10000, 0.2, and 4;
- A method for calculating and outputting the interest on the principal amount.
- N/B: Use Constructor.

QUESTION FIVE [18 MARKS]

a) Overloading is a type of polymorphism in OOP. Justify this statement with respect to addition operator. **[4 marks]**

b) Prince has been advised to exploit inheritance when designing his OOP project. Outline **four** benefits of inheritance that could have influenced the advice. **[4 marks]**

c) Explain the term default constructor as used in Java Programing. **[2 marks]**

d) With the aid of the general java syntax, explain inheritance as used in OOP.

                                                [3 marks]

e) Write a Java program that would calculate the volume of a cylinder. Use PI as 3.142.

                                                [5 marks]