

ZIMBABWE EZEKIEL GUTI UNIVERSITY



FACULTY OF SCIENCE, TECHNOLOGY, AGRICULTURE AND FOOD SYSTEMS DEVELOPMENT

DEPARTMENT OF INFORMATION SYSTEMS

EXAMINATION PAPER

COURSE CODE: DIS113
COURSE TITLE: INTRODUCTION TO PROGRAMMING
USING C#
SPECIAL REQUIREMENTS: NONE
LEVEL:
EXAM DURATION: 3 hours
DATE: JUNE 2024 12 JUN 2024

Instructions

- (i) Answer any five questions**
- (ii) Number your answers accordingly.**
- (iii) Start answering each question on a new page**

Question 1

- a) Explain the difference between passing parameters by value and passing parameters by reference. [4 marks]
- b) Explain the difference between the **while** loop and the **do...while** loops [4 marks]
- c) Write a C# program to read two numbers through the keyboard then calculate and display the product of the two numbers if their sum is less than 100. If the sum is greater than 100 then display their difference [10 marks]
- d) Define what a **constant** is in C# [2 marks]

Question 2

- a) State and illustrate any **three** control structures used in programming [9 marks]
- b) Given the array $A = [4, 7, 10, 3, 2, 11, 6, 8]$, write a C# program that accepts the elements of the array through the keyboard and computes the sum of the elements of the array [6 marks]
- c) C# is a statically typed language. Explain why it is important to state the data type when declaring a variable [5 marks]

Question 3

- a) State any **four** characteristics of the C# programming language that make it a good choice for developing applications. [4 marks]
- b) State with examples the different types of comments that can be used in C# [4 marks]
- c) Explain the term boxing in C# [2 marks]
- d) Write a function that receives an integer parameter and calculates and displays the square of the parameter without returning a value to the calling program. [10 marks]

Question 4

- a) Demonstrate with an example why the **do...while** loop executes at least once [4 marks]
- b) Consider the following function named Compute which is invoked by the main program.

```

void Compute(ref int X, int Y){
    X+= 23;
    Y = 2(X + 13);
}

void static main(int[] args){
    int A, B;

    A = 15;
    B = 12;

    Compute(A, B);
    Console.WriteLine("Value of A: ", A);
    Console.WriteLine("Value Of B: ", B);
}

```

State and explain the values of A and B printed in the main program after calling the function **Compute**.

[6 marks]

- c) Let A = 9, and B = 13. Evaluate the following expression as executed by a C# compiler:

$$A + 7(A - 5) * B / 3$$

[2 marks]

- d) Write a C# program or function that takes in a username and password. After three unsuccessful attempts the program should inform the user that they will be locked out, else the user should receive a "Login successful" message

[8 marks]

Question 5

- a) State any 4 rules to be followed when naming variables in C# [4 marks]
 b) Explain boxing and unboxing in C# [6 marks]
 c) A C# program reads a person's age through the keyboard and informs the user that the age is for a minor if the age is below 18 years. Otherwise the program should inform the user that the age is for an adult. Draw a flowchart to illustrate the flow of such a program [6 marks]

d) Explain the advantages of breaking down a large program into smaller subprograms

[4 marks]

Questions 6

a) Explain the importance of using comments when writing program code.

[4 marks]

b) State with examples the different types of comments found in C#

[4 marks]

c) Given the array $A = [64, 21, 78, 21, 10, 14, 18]$

(i) What is the size of the array?

[2 marks]

(ii) Write a C# program that can be used to calculate the average of the numbers in the array

[6 marks]

d) Distinguish between passing parameters by value and passing by reference

[4 marks]

END

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