THE UNITED REPUBLIC OF TANZANIA
NATIONAL EXAMINATIONS COUNCIL OF TANZANIA
ADVANCED CERTIFICATE OF SECONDARY EDUCATION EXAMINATION

136/1

COMPUTER SCIENCE 1
(For Both School and Private Candidates)

Time: 3 Hours **Year: 2024**

Instructions

1. This paper consists of sections A and B with a total of **ten (10)** questions.
2. Answer **all** questions from section A and **two (2)** questions from sections B.
3. Section A carries **seventy (70)** marks and section B **thirty (30)** marks.
4. All writing must be in **blue** or **black** ink, **except** drawings which must be in pencil.
5. Cellular phones and any unauthorised materials are **not** allowed in the examination room.
6. Write your **Examination Number** on every page of your answer booklet(s).

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SECTION A (70 Marks)

Answer **all** questions in this section.

1. (a) Half adder and full adder are both combination circuits that perform binary addition. In two points, differentiate them according to their logic circuit operations.

   (b) Draw the half adder using only NAND gates.

   (c) Construct the truth table of the Boolean expression $F = A + \overline{AB} + ABC$.

2. (a) Under which condition does the function returns zero or 1 value?

   (b) Outline two special roles of the "main function" in a C++ programing.

   (c) There are two methods of calling a function in C++ programing. What is the main benefit of using a call by-value over a call by-reference?

   (d) Study the following C++ program and answer the questions that follow;

```
Int main ( ) .....1
{
 void change(int); ..... 2
        int orig=2;
        cout <<" The original value is:" <<orig<<" \n"; ..... 3
        change (orig); ..... 4
        cout <<" The new value after change:" <<orig<<" \n"; ..... 5
 return 0; ..... 6
 }
        void change (int orig) ..... 7
        {
         orig=4; ..... 8
         cout <<" value of origin in function change ( ) is:"<<orig<<"\n"; 9
         return;
 }
```

   (i) What will be the output of the codes labeled with the lines 3, 5 and 9?

   (ii) What will be the output when a call by-reference method is used in a function change ()?

3. Two groups of Form IV students were asked to construct a program required to find the summation of the first N positive numbers. The first group constructed their program without designing algorithm and the second group designed an algorithm before constructing the program.

   (a) Which group used the best practice of programming? Give a reason.

   (b) Identify three criteria that indicate the successful algorithm.

   (c) Draw a flowchart for finding the summation of the first N positive numbers.

4. In 2023 the customers of ABC bank located in Panama complained that their private bank accounts have been connected with the terrorist funding agent via the secret document released by illegal data access organization.

(a) Explain three ways which aid illegal data access organization to access customers' bank account information.
(b) Which two laws were violated by the incident?
(c) Explain two control measures that the bank can use to avoid such problem in future.

5. The Nobel Academy School (NAS) has connected all of its computers in a Local Area Network (LAN). Staff members experience several problems due to physical arrangement of computers in the network.

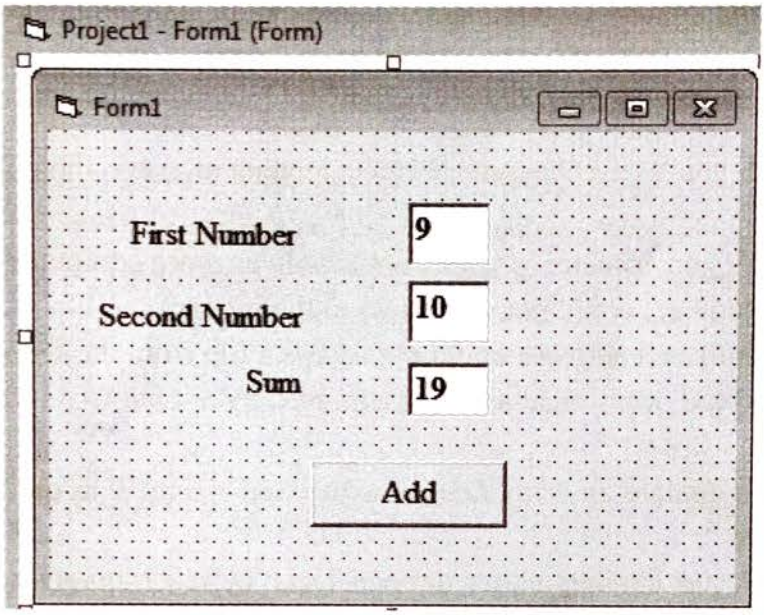
(a) How would you assist the school management to solve the following existing problems:
  (i) Network performance worsens noticeably as more computers added.
  (ii) Staff members could not get access to the internet.
  (iii) Some staff in a network could not access a file from the server.
(b) Identify the type of physical arrangement used by a school.

6. (a) How do you declare an array *Length* with fixed size of *9* as an *Integer* in Visual Basic?
(b) How would you declare a user defined Data Type *ProductDetails* with *ProdId* and *ProdName* holding *String* values, as well as *Price* holding *Currency* value in Visual Basic?
(c) Extract all errors from the following visual basic codes segment.

```
Private Sub Command1_Click()
{
        Dim class type As String
        Dim number, fare As Single
        Dim amount As Single
        number =Val(Text1.Text)
        classtype = Combo1.Text
        Select Case classtype
        Case "FIRST CLASS"
        fare = 500
        Case "SECOND CLASS"
        fare = 400
        Case "AC"
        fare = 650
        Case "UNRESERVED"
        fare = 250
```

```
        End Select;
        amount = fare* number
        Text2.Text = Str(amount)
    }
    End Sub
```

(d) The following Figure shows the screenshot of the Visual Basic (VB) Program that finds the summation of two numbers. Which codes activates the button "Add" in order to perform the intended task?



7. Currently, many of the workplaces in our country are automated with Information Technology facilities. Assess the positive impact of using Information Technologies according to:
   (a) the number of jobs available.
   (b) the skills needed to find a job.
   (c) the exposure of employees to dirty and dangerous working conditions.
   (d) the productivity of workers.

SECTION B (30 Marks)

Answer **two (2)** questions from this section.

8. You have been appointed to prepare a presentation that explains the benefits that the government of Tanzania and private sectors will get after improving their performance from using computers in the daily operations. Describe five points which will guide your presentations.

9. Juma has a project of developing new software for the supermarket owned by XYZ Company Ltd. Suppose he hired you to participate in preparing system documentation

for the software developed, what are the five important components would be required to achieve the goal?

10. Lowino deposited Tshs. 20,000.00 in OKOLO Saccos at an interest rate of 20% per year. At the end of each year, the interest earned is added to the deposit amount and a new amount becomes the deposit for next year. You have been asked to assist him.
    (a) Write an algorithm for a program that would track the growth of the deposit over a period of seven years.
    (b) Use HTML and JavaScript to construct a program that would implement the algorithm in part (a).

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