

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).



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++ programming.
(c) There are two methods of calling a function in C++ programming. 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.
- Explain three ways which aid illegal data access organization to access customers' bank account information.
 - Which two laws were violated by the incident?
 - 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.
- How would you assist the school management to solve the following existing problems:
 - Network performance worsens noticeably as more computers added.
 - Staff members could not get access to the internet.
 - Some staff in a network could not access a file from the server.
 - Identify the type of physical arrangement used by a school.
- 6.
- How do you declare an array *Length* with fixed size of 9 as an *Integer* in Visual Basic?
 - 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?
 - Extract all errors from the following visual basic codes segment.

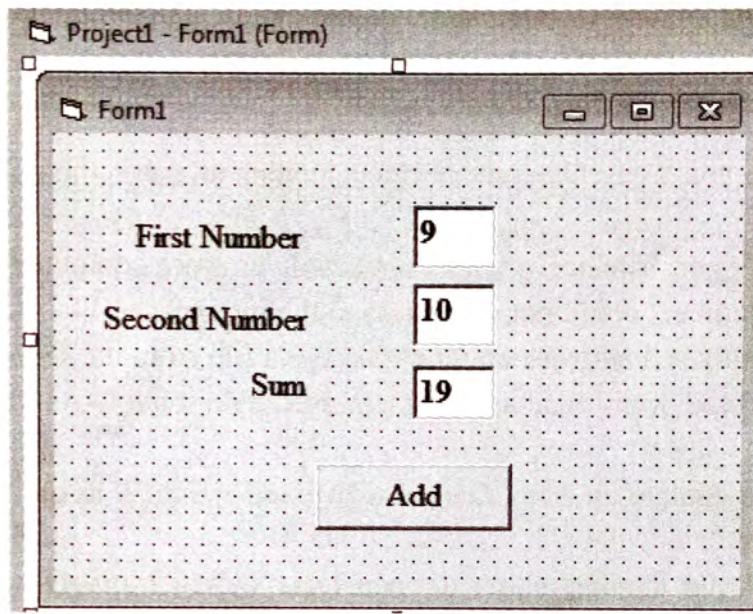
```
Private Sub Command1_Click()
{
    Dim class type As String
    Dim number, fare As Single
    Dim amount As Single
    number = Val(Text1.Text)
    classtype = Combo1.Text
    Select Case classtype
        Case "FIRST CLASS"
            fare = 500
        Case "SECOND CLASS"
            fare = 400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

```

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:
- the number of jobs available.
 - the skills needed to find a job.
 - the exposure of employees to dirty and dangerous working conditions.
 - 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).

**THE UNITED REPUBLIC OF TANZANIA
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EXAMINATION**

136/2

COMPUTER SCIENCE 2
(For Both School and Private Candidates)

Time: 3 Hours

Year: 2024

Instructions

1. This paper consists of **three (3)** questions.
2. Answer **two (2)** questions including question **one (1)**.
3. Save your work on the desktop in the folder named by your **Examination Number**.
4. Save your work by using the 1997-2003 version of the MS Office software.
5. Check whether the **printed** work(s) are similar to the **softcopy** saved in the folder.
6. Submit printed codes and screenshots together with the softcopy of your work(s).
7. Cellular phones and any unauthorised materials are **not** allowed in the examination room.
8. Type your **Examination Number** on every page of your softcopy work(s).



N

1. The Nobel Academy School (NAS) pays its employees based on the following criteria: Each employee is enabled with additional of 20% of the basic salary for House Allowance (HA), 15% for Lunch Allowance (LA) and 5% for Transport Allowance (TA). However, 10% of basic salary is deducted from each employee's salary for Social Security (SOSE) fund contribution. Fifteen per cent (15%) of the gross salary is deducted as Pay as You Earn (PAYE) if the employee's gross salary is more than 200,000 but less or equal to 500,000. If the employee's gross salary is more than 500,000 but less than or equal to 1,000,000, then 20% of the employee's gross salary is deducted as PAYE. Otherwise, thirty per cent (30%) is deducted.

- (a) Use C++ programming language to develop a program which prompts a user to enter 100 employees' names. The program should display each employee's Name, Basic Salary, House Allowance (HA), Lunch Allowance (LA), Transport Allowance (TA), Social Security (SOSE) fund, Gross Salary, Pay as You Earn (PAYE) and Net Salary.
- (b) Test your program for three employees and print a screen shot.

HINT:

- Gross Salary=Basic Salary +HA+LA+TA
- Net Salary= Gross Salary-PAYE-SOSE
- Organize your program in three functions; **PataData()** for capturing employees details, **KokotoaMshahara()** for calculating the salary and **PrintSlip()** for displaying employees salary.

2. (a) The National Electro Commission (NEC) is facing difficulties in updating the voters` book including new voters. However, the work plan is done manually which hinders citizens to register online. Currently, the director has decided to establish online form to solve this problem. Use HTML codes to design a registration form as given in Figure 1.

Online Registration Form!!

National Identity Code:

Name:

Birthdate:

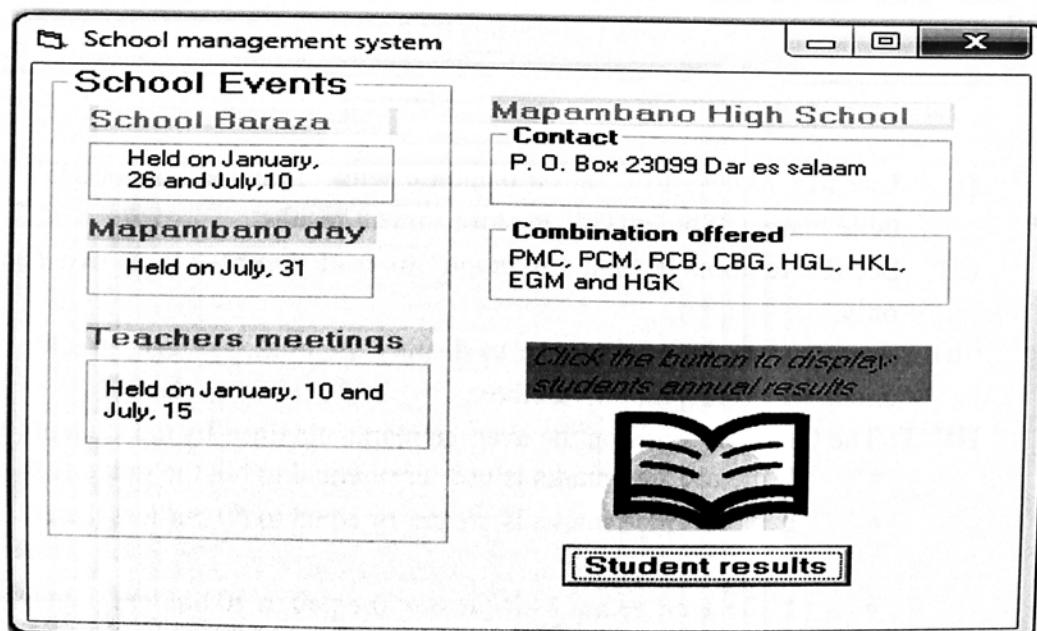
Gender: Male Female

Zone:

Figure 1

Form descriptions:

- The font color and size of the heading “Online Registration Form” should be blue and 14 respectively.
 - The input type of the textbox for National Identity Code should be password.
- (b) Use JavaScript to activate the form created in Figure 1 in order to display the following messages in the message box;
- “Fill all blanks” if any text box is not filled.
 - “You are not Tanzanian” if the entered National Identity Code is **not** 02551961.
 - “Your age should be above 18” if the difference between entered year at the birthdate textbox and election year 2025 is less than 18.
 - “Congratulation! You have registered successful” if all details are filled as required. A form should also display “Your Voting Identification Code is T.xxxxxyy” where xxx is the National Identity Code and yy is the entered birthdate.
- HINT:** (Message should be displayed when a user clicks a Submit button).
3. Students' academic records at Mapambano high school which were stored in paper based format were burnt due to fire accident few weeks ago. As a result, the Headmaster recommended the deployment of a Computerized School Management System which will manage students' academic results as well as school events (Figure 2). You have been asked to develop a Visual Basic program which will accept student personal and academic particulars. The program then computes total, average, grade performance and display list of student particulars in a grid view (Figure 3). Study Figure 2 carefully and answer the questions that follow;

**Figure 2**

- (a) Create an interface form depicted in Figure 2.
 (b) Create another two interface forms depicted in Figures 3 and 4.

studentid	studentName	Subject1	Subject2	Subject3	Subject4	Total	Average	Grade
1001	Ngasha Kolimba	34	76	12	89	211	52.75	C
1050	Tambwe Bakari	56	70	12	57	195	48.75	C
1076	Tatu Duku	89	22	56	90	257	64.25	B
1011	Tango Sanga	78	12	89	90	269	67.25	B

Figure 3

- Use MS Access to create a database with the name “SchoolDb” then add the table named “StudentTbl” to store student results.
- Set the textbox labeled “Average” to read numbers with two decimal places only.
- Automate an Interface Form to display the total, average, grade when the user clicks the corresponding textbox.

HINT: The Grade depends on the average marks obtained by the students as follows:

- If the average marks is greater or equal to 80, the grade is A
- If the average marks is greater or equal to 60 but less than 80, the grade is B
- If the average marks is greater or equal to 40 but less than 60, the grade is C

- If the average marks is greater or equal to 20 but less than 40, the grade is D
 - Otherwise the grade is F.
- (c) Activate the button “Student results” in Figure 2 so that when a user clicks on it, it opens a message box to ask whether a user is a teacher or student.
- (i) If a user is a teacher, it opens the Form given in Figure 3 which will help a teacher to manage student's results.
- (ii) If a user is a student, it opens the form given in Figure 4. Activate “Search” button so as to enable a student to search the grade scored by entering student number and clicking search button.

The figure shows a window titled "Student results". Inside the window, there is a text input field labeled "Enter your number" with the value "1002" entered. Below it is a button labeled "Search". At the bottom, there is another text input field labeled "Your grade is" with the value "D" entered.

Figure 4