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

136/1   **COMPUTER SCIENCE 1**

(For Both School and Private Candidates)

Duration: 3 Hours   **ANSWERS**   **Year: 2025**

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. The Dar es Salaam Rapid Transit (DART) company wants to install a new smart system that the passenger can use coins and smart cards to get access. The planned system is expected to operate in discrete mode using two inputs either a passenger and coin or a passenger and smart card. Perform the following tasks required in designing the new DART system:

   (a) Create a truth table that represents the DART new smart system.

   The system uses two inputs: Passenger (P) and Payment method (C for coin, S for smart card). The output (Access) is 1 when the passenger uses either a coin or a smart card.

Passenger (P)	Coin (C)	Smart Card (S)	Access (A)
0	0	0	0
0	1	0	0
0	0	1	0
1	0	0	0
1	1	0	1
1	0	1	1
1	1	1	1

   (b) Use the truth table constructed in 1(a) to generate a simplified Boolean expression.

   From the table, access is allowed when both passenger (P) and either coin (C) or smart card (S) are present.

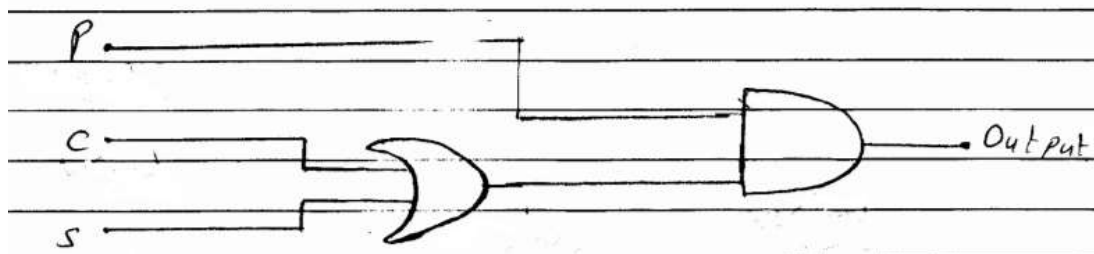Therefore, the simplified Boolean expression is:

A = P (C + S)

(c) Draw the logic gate circuit for the simplified Boolean expression in 1(b).

The circuit contains one OR gate and one AND gate.

 Inputs C and S go into the OR gate.

 Output from the OR gate and P go into the AND gate.

 The output of the AND gate is the Access signal (A).

2. (a) Compare the following C++ programming terms and give one example for each.
    (i) Formal and actual function parameters.

Formal parameters are variables defined in the function header that receive values from the calling function.
Example: void sum(int a, int b) → here, a and b are formal parameters.

Actual parameters are the real values or variables passed to the function when it is called.
Example: sum(5, 8) → here, 5 and 8 are actual parameters.

(ii) Pre-decrement and post-decrement operators.

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Pre-decrement operator decreases the value of a variable before it is used in an expression. Example: --x.

Post-decrement operator decreases the value of a variable after it is used. Example: x--.

(b) Construct a C++ program that adds two real numbers entered by a user.

```cpp
#include <iostream>

using namespace std;

int main() {

    float num1, num2, sum;

    cout << "Enter first number: ";

    cin >> num1;

    cout << "Enter second number: ";

    cin >> num2;

    sum = num1 + num2;

    cout << "Sum = " << sum;

    return 0;

}
```

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3. The Computer Research Institute (CRI) disposes its electronic waste (e-waste) on landfills without taking any precautions.

(a) What are the two major environmental effects caused by the CRI actions?

It leads to soil pollution due to toxic materials like lead and mercury seeping into the ground.

It also causes water pollution when heavy metals mix with groundwater and nearby rivers.

(b) Which safest disposal method can be used by the CRI?

The safest method is recycling and reusing of electronic components through certified recycling plants.

(c) Why CRI is advised to use proper electronic waste? Explain by giving four reasons.

Proper disposal helps protect the environment from toxic contamination.

It conserves natural resources by recovering valuable materials like gold and copper.

It reduces waste volume in landfills, making waste management more sustainable.

It ensures compliance with environmental laws and prevents penalties.

(d) Describe two health hazards that can be linked to poor e-waste management.

Exposure to heavy metals causes respiratory and neurological problems.

Handling e-waste without protection can lead to skin diseases and cancer due to chemical exposure.

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4. (a) Memo primary school plans to connect the computers to its three offices located in the same building.

   (i) Which type of network would you suggest to be established?

A Local Area Network (LAN) is suitable since it connects computers within a small geographical area.

(ii) Identify three basic network components that should be used in installing the network.

Network cables for connecting devices,
A network switch or hub for signal distribution,
Network interface cards (NICs) for enabling computer communication.

(iii) Explain three advantages of the type of network identified in 4(a)(i).

LAN enables easy sharing of files and printers among users.
It allows centralized data management and backup.
It enhances communication through instant messaging and email within the school.

(b) Describe two benefits of using bounded media instead of unbounded media in connecting school network.

Bounded media such as twisted pair cables are less affected by electromagnetic interference.
They provide higher security since data signals are confined within the cable.

5. (a) Construct a Visual Basic program that will assist the restaurant to manage its daily sales. The program prompts a user to enter food price via a text box appeared in a form. The program also should display the type of food ordered in a message box according to the price range specified in Table 1.

```
Private Sub cmdCheck_Click()

    Dim price As Integer

    price = Val(txtPrice.Text)

    If price >= 10000 Then

        MsgBox "Sea Food"

    ElseIf price >= 5000 Then

        MsgBox "Vegetarian Food"

    Else

        MsgBox "Other Food"

    End If

End Sub
```

(b) Write a Visual Basic program that validates the application date of interview for new employees.

```
Private Sub cmdValidate_Click()
```

```
Dim todayDate As Date

Dim interviewDate As Date

todayDate = Date

interviewDate = CDate(txtDate.Text)

If interviewDate >= todayDate And interviewDate <= todayDate + 4 Then

    MsgBox "Valid Date"

Else

    MsgBox "Invalid Date"

End If

End Sub
```

(c) What is the function of the following Visual Basic tools in customizing a form?

(i) Option Button – allows the user to select one choice from multiple options.

(ii) Label – displays descriptive text or titles on a form.

(iii) Timer – executes events at specified time intervals automatically.

(iv) Combo Box – provides a dropdown list for users to choose from available options.

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6. (a) Why is Hyper-Text Markup Language (HTML) not considered as true programming language? Explain by giving two reasons.

HTML does not contain logic-based features such as loops or conditional statements. It is a markup language used for structuring web content, not for computation or processing.

(b) What are the three advantages of embedding JavaScript codes in HTML document?

It enhances interactivity by allowing dynamic web content.
It reduces server load since validation and processing can occur on the client side.
It improves user experience through animations and real-time updates.

7. Nzele Company Ltd. plans to utilise computers for managing day-to-day operations in its newly established branch. To meet the requirements, the company purchased computers, the Microsoft Windows Operating System, and the Microsoft Office program. The company's IT officer installed the software on the computers, starting with the Operating System (OS) followed by Microsoft Office.
(a) Why is the IT officer started to install OS? Give two reasons.

The operating system is necessary for controlling hardware and providing a platform to run other programs.
Application software like Microsoft Office cannot function without an operating system.

(b) Why is the company decided to buy and use the software rather than developing its own? Give three reasons.

Buying ready-made software saves time and reduces development costs.

Commercial software is more reliable since it is developed and tested by professionals.

It allows the company to receive updates and technical support from the vendor.

SECTION B (30 Marks)

Answer any two (2) questions from this section.

8. "Effective software development involves various categories of key personnel." Justify this statement by giving eight points.

   System analysts study user requirements and prepare design specifications.

   Programmers convert system designs into executable computer programs.

   Project managers coordinate team activities and ensure timely completion.

   Database administrators design and maintain efficient data storage systems.

   Software testers detect and correct errors before final implementation.

   Technical writers prepare user manuals and documentation.

   User interface designers develop attractive and user-friendly layouts.

   Maintenance engineers provide updates and troubleshoot after deployment.

9. Mashaka has been working for a new album expected to be released at the end of the year. Some of the lyrics, sound tracks, and sampled songs are saved in his computer. A few days ago, Mashaka heard the song in the city radio which had the same lyrics content as one of the songs in his unreleased album. Describe three possible factors which led to the leakage of his song and three ways that could have been used to avoid it.

One possible cause is computer hacking, where unauthorized users accessed his files through weak security settings.

Another cause could be sharing his files via email or social media without adequate encryption.

An insider or collaborator might have leaked the content intentionally or carelessly.

To prevent leakage, Mashaka could use strong passwords and encryption to protect files.

He should avoid sharing sensitive data over insecure networks.

He should also restrict file access to trusted individuals only.

10. Explain three benefits and three limitations of static data structure in developing computer project.

Benefits include simplicity in design since data elements are fixed in size and number.

Static structures allow faster access to data due to predictable memory allocation.

They use less memory overhead because allocation is done once during compilation.

Limitations include lack of flexibility since size cannot be changed during runtime.

Memory wastage occurs when allocated space is not fully utilized.

It is unsuitable for dynamic data applications like queues or linked lists that require frequent resizing.

Find this and other free resources at: https://maktaba.tetea.org

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