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: 2023**

Instructions

1. This paper consists of sections **A** and **B** with a total of **ten (10)** questions**.**

2. Answer **all** questions in section **A**, and **two (2)** questions from section **B**.

3. Section **A** carries **seventy (70)** marks and section **B** carries **thirty (30)** marks

4. Non-programmable calculators may be used.

5. Cellular phones and any unauthorized 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) The use of hierarchy memory technologies is a cost effective technique for designing large computer systems. It includes six general classes of storage media;

   (i) What are the six general classes of storage media made up a memory hierarchy?

   (ii) Arrange the classes of storage media provided in 1 (a) (i) in a Typical Storage Hierarchy Ladder Diagram.

   (b) Describe the two types of the memory located at the top of the hierarchy.

2. ABC Company Ltd wants to install an electric fence system to its customers. One of its logical circuits is derived from the Boolean expression

   $X = AB + ABC + A\overline{BC} + A\overline{C}$.

   (a) Use Boolean laws of algebra to simplify the given Boolean expression.

   (b) Draw the logic gate circuit for the simplified Boolean expression in 2 (a).

   (c) Use a truth table to determine what input conditions produce logic 1 output in the logic gate drawn in 2 (b).

3. (a) Programs allocate memory to variables statically or dynamically depending on the programmers' requirement;

   (i) What does the variable mean?

   (ii) What is the difference between dynamic and static memory allocation? Give one circumstance in which you would prefer one instead of the other.

   (b) You are given the following set of integers 53, 45, 30, 67, 20, 55, 60. Design a program that would read and display them in an ascending order.

4. Umoja Secondary School introduced an awareness campaign for optimal use of its electricity to the community members. In that campaign, you decided to develop a site that will provide awareness of switching ON and OFF the light in classrooms

appropriately. Write HTML embedded with JavaScript codes that will help you to display the webpage in Figure 1.
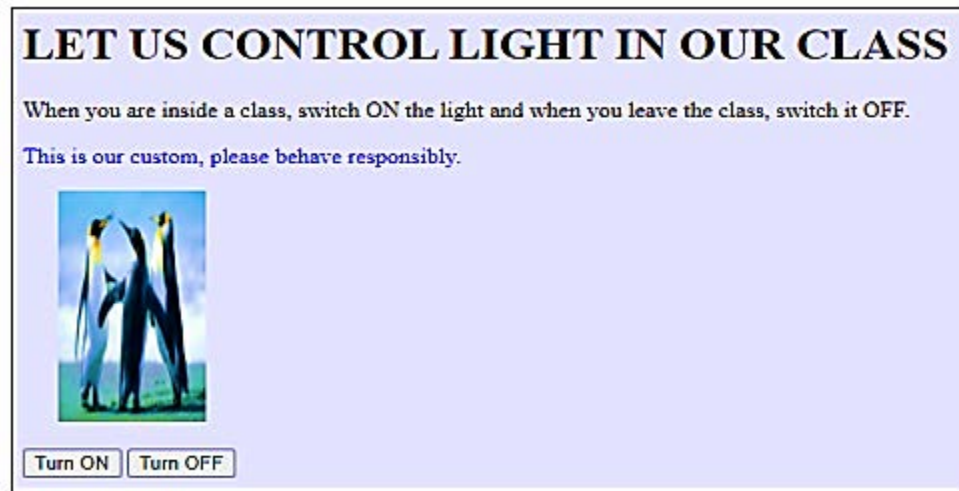

LET US CONTROL LIGHT IN OUR CLASS

When you are inside a class, switch ON the light and when you leave the class, switch it OFF.

This is our custom, please behave responsibly.

Turn ON   Turn OFF

Figure 1

Use the following descriptions to design your page.

- The Page background colour should be Lavender.
- The Heading should be set with level 1 effect.
- The Text colour in the third sentence should be blue.
- The Dimensions to a bulb should be 90 and 170, width and height respectively.
- When button "Turn ON" is pressed, the bulb switched ON and when button "Turn OFF" is pressed, the bulb switched OFF.

5. (a) Assume that Form1 in Visual Basic is a custom dialog box. What are the activities of the following statements?

(i) Form1.Show (ii) Form1.Hide

(b) Tanzania Railway Cooperation (TRC) needs to validate the date of travel for the reservation facility. The booking should either be on the current day or the next 15 days. How would you implement this using Visual Basic?

(c) The following table shows ages of members and activities available in a Bonanza.

Age	Activity
51 and over	Charting
31 – 50	Swimming
16 – 30	Playing volleyball
Less than 15	Dancing

Use the information in the table to write a Visual Basic program that accepts the age of a member through a text box. The program should then display the activity on a message box.

6. (a) The rapid growth in the use of Information and Communication Technology in the society has attracted tremendous attack of the government and organizations unauthorized data via internet. Explain two principles that can be applied to avoid cyber-attack.

(b) Emma Sugar Company (ESC) utilizes computerized system to operate its day to day activities. Recently, the company's manager claims to have lost employee details and therefore found it difficult to pay them timely;

　　(i) What are the two possible causes of the data loss?

　　(ii) Suggest two control measures you would take to avoid future loss of the data.

7. Makole district hospital employees are facing a challenge of slowness in updating and retrieving of the information from their computers connected in a network. After detailed investigation, you realized that the network topology used produces much traffic as users connecting to the network increases. Suppose you are requested to redesign the network so as to improve the performance of the system;

　(a)　What type of network topology was used in the hospital computer network?

(b) Outline four factors you will consider before proposing a new network topology to the hospital management.

(c) Which type of network topology will you suggest to design in order to replace the current network? Give a reason.

(d) What are the four communication devices will be required to setup a new network topology?

SECTION B (30 Marks)

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

8. A computer science student was assigned to create a program to help his teacher to produce annual students' reports. However, he was advised to use low and high levels of programming languages. Why was the student advised to use both programming languages? Give three points for each.

9. The school librarian thought of having an electronic system to manage book borrowing process. If you were asked to collect information required to design this system, how would you carry out your task? Elaborate your answer by giving four points.

10. Analyze three opportunities and three challenges brought by IT in the work place.

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136/2

COMPUTER SCIENCE 2
(For Both School and Private Candidates)

Time: 3 Hours   **Year: 2023**

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).

1. Considering COVID 19 pandemic outbreak, many places across the world were economically and socially affected. During that moment, lots of social services including schools were in lockdown. Manager at Udzungwa primary school recommended that; mathematics lessons should continue to be taught online alternatively to physical classes. You are required to develop a C++ e-learning program by defining a string array named **str[10]**, to compute area of various shapes such as square, rectangle, triangle and circle. It shall also be able to calculate volume of rectangular box and cylinder respectively. The program must allow user to choose "A" if intending to compute Area and "V" if intending to compute Volume, followed by the name and measurements of the shape.

Use the following formula to develop your program:

(i)   In case of area use;

Name of the figure	Formula to use
Square given by	$side \times side$
Rectangle given by	$length \times width$
Triangle given by	$\frac{1}{2} \times base \times height$
Circle given by	$3.14 \times radius \times radius$

(ii)   In case of volume use;

Name of the figure	Formula to use
Rectangular box given by	$length \times width \times height$
Cylinder given by	$3.14 \times radius \times radius \times height$

2. (a)   Most of the Mambo Microfinance Bank (MMB) customers are complaining on the poor handling of their loan calculations. Currently, their loans are being calculated by the bank personnel without sharing necessary information to them. To solve this problem, MMB manager decided to add online loan calculator page on the bank website which will allow customers to manage their loan online. Use HTML to design the interactive loan calculator page as given in Figure 1.

Enter Loan Information
1) Amount of the loan (any currency):
2) Annual percentage rate of interest:
3) Repayment period in years:

Compute

Payment Information
4) Your monthly payment:
5) Your total payment:
6) Your total interest payments:

Are you interested?

Figure 1

(b) Use JavaScript to activate the page given in Figure 1 in order to calculate monthly payment, total payment and total interest payments after clicking the command button "Compute".

HINT: -
(i) Use the following formula to calculate monthly payment, total payment and total interest payments.

- Monthly payment $= \text{loan}\left[1+\dfrac{\text{interest}}{100\times12}\right]$

- Total payment $= \text{loan}\left[1+\dfrac{\text{interest}}{100\times12}\right]^{\text{years}}$

- Total interest payment $= $ total payment $-$ loan.

(ii) The font style and size of the text "Are you interested?" should be Apply "lucida handwriting."

(c) Activate the link "Are you interested?" in Figure 1 to enable interested customer to fill all required details as given in Figure 2.

Kindly fill your detail here!!

Name:

Email:

Phone:

Comment:

Send

Figure 2

3. Dobi Washing Company provides washing and cleaning services in Arusha region. Currently, the company operates its billing processes manually, which delays the bill provision to customers. To improve its billing process, the company intends to deploy a Computerized Billing System. Among other functions, the system will enable receptionist to bill the customer by selecting the requested services along with its discount for his/her customer as shown in Figure 3. Using Visual Basic Program;

(a) Create an interface form as depicted in Figure 3.

Figure 3: DOB Payment Form

(b) Activate the button "Calculate", so that when a user clicks on, the program displays a Message Box showing calculated price after discount and customer name.

(c) Activate the button "Clear", so that when user clicks on, the program erases all inputs data in the form.

(d) Activate the button "End", so that when user clicks on, the program exits the window form.

(25 marks)