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

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

(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.



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.