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: 2022**

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 sections B.
3. Section A carries **seventy (70)** marks and section B carries **thirty (30)** marks.
4. Cellular phones and any unauthorised materials are **not** allowed in the examination room.
5. Write your **Examination Number** on every page of your answer booklet(s).

SECTION A (70 Marks)

Answer **all** questions in this section.

1. The headmaster of a certain school assigned you a task to create a school database that will store a record of students' information using Microsoft access. The database should be featured by a friendly user interface and restricts unauthorized access to information;

   (a) Explain the feature you would use to design a friendly user interface.
   (b) Describe the steps you would use to create that feature in 1 (a).
   (c) Explain three data security tools that can be applied to enforce security in a school database.

2. (a) Why is it more efficient for a computer to use hexadecimal number system instead of binary number system for data representation? Briefly explain by giving two reasons.
   (b) Simplify the following Boolean expression and draw its logic gate;

   $F = XY + XYZ + XY\overline{Z} + \overline{X}YZ$

   (c) With the aid of diagram, use the concept of logic gate to illustrate how AND gates can be derived from NOR gate.

3. You have been requested by a Natma Mall Director to construct a system that will offer a discount of 10% if the quantity purchased costs more than Tshs. 100,000/-. The system prompts a seller to enter the quantity and price per item through a keyboard;
   (a) Write a pseudocode to calculate the total payable amount for any customer purchasing items from Natma Mall.
   (b) Write a corresponding C++ program from the pseudocode obtained in 3 (a).

4. Student A sent a message "MAMBO" to student B through the email. Out of their understanding, student C was able to capture that message but in the form of "WKDQNBRX". Student C failed to understand the meaning of that message because it was in different form so their communication remains protected.
   (a) Differentiate a message "MAMBO" from "WKDQNBRX".
   (b) What happened to the sent message which affects the word MAMBO to change its letters?
   (c) Explain two methods that can be used to ensure safe communication between student A and B.

5. Form six students have decided to design a school website. In one of the pages, they include information related to time management in a class as it appears in Figure 1.

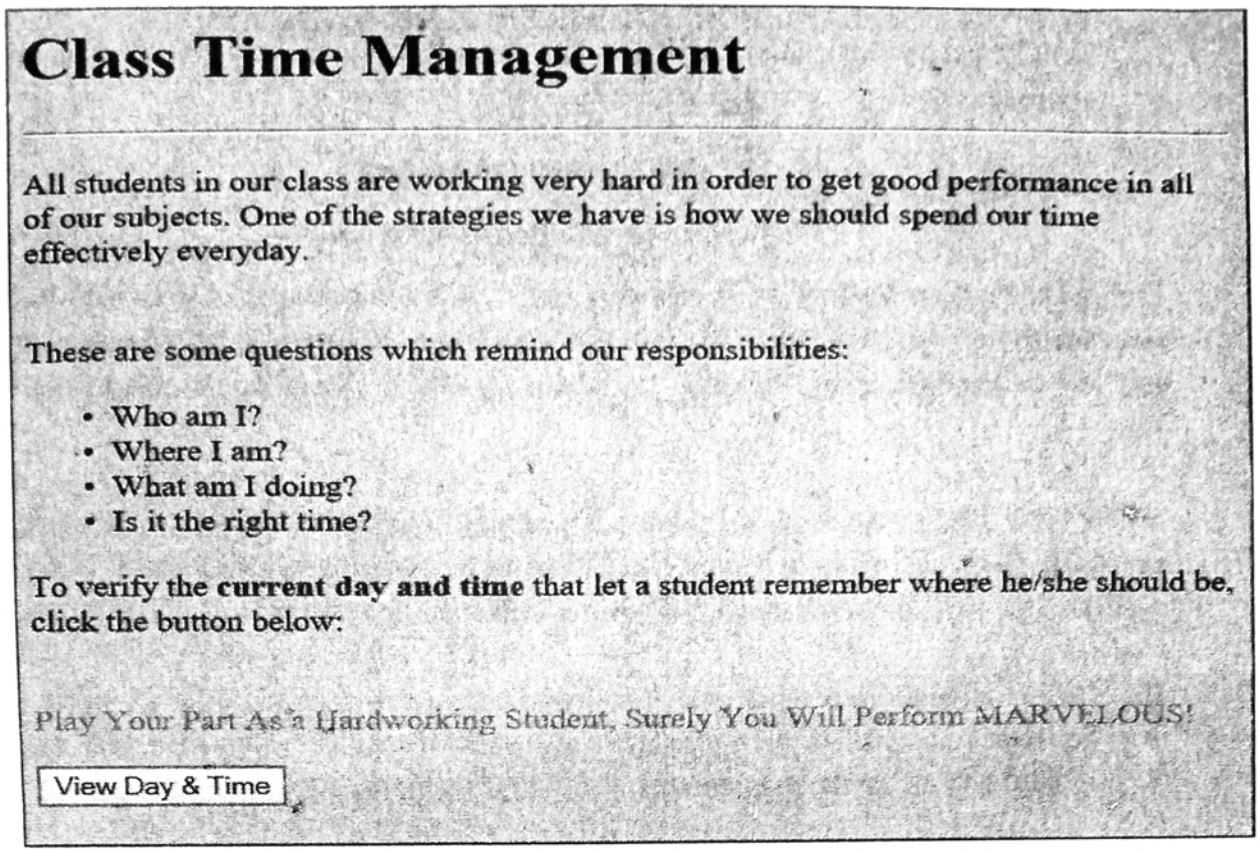

Figure 1

Write HTML codes that used to display a designed page.

Use the following Page Descriptions:

(i) Page background colour should be Magenda.
(ii) Heading should have level 1 effect.
(iii) Text colour of the last sentence should be red.
(iv) When a user clicks 'View Day & Time' button, a statement 'Play Your Part As .....' should be replaced with a current day and time.

6. (a) Suppose you want to design or customize a form by using controls in a Visual Basic (VB) program, identify the controls that can perform the following tasks on a form;
   (i) Enables event to occur repeatedly at a specific interval.
   (ii) Draw circles, ellipses, square and rectangles within the form.
   (iii) Display text that is not editable on the form.
   (iv) Display information from an existing database.
   (b) Describe the relationship between forms and controls as used in visual basic (VB) programming.
   (c) Explain the procedures for adding new forms to the Visual Basic (VB) project.

7. A software developer working on Delle-IT Company spends almost 14 hours a day on the computer to fulfill official duties. After a consecutive two years of the working schedule, he started falling sick;
   (a) Identify three health risk hazards associated with the extended use of a computer.
   (b) Explain the possible three solutions for each health risk identified in 7 (a).

(c) Briefly explain the main challenge that any IT company may face when disposing computers parts.

SECTION B (30 Marks)

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

8. The Dar es Salaam Institute of Technology has recently experienced exponential increase of the students and staff members. The institute has planned to establish a database to store their data and be handled easily. Describe six advantages the institute would enjoy from the new plan.

9. A new bank TBP established in Dodoma is planning to own branches in 10 more regions of Tanzania. The bank wants to have all its offices to be connected electronically. Describe six important devices which can assist the bank to implement the idea.

10. (a) Design an algorithm using flowcharts for a program to find and print all prime numbers between 1 and 50. The program should also count them and display their number.
(b) Use C++ to create the program that would implement the algorithm in 10 (a).