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.

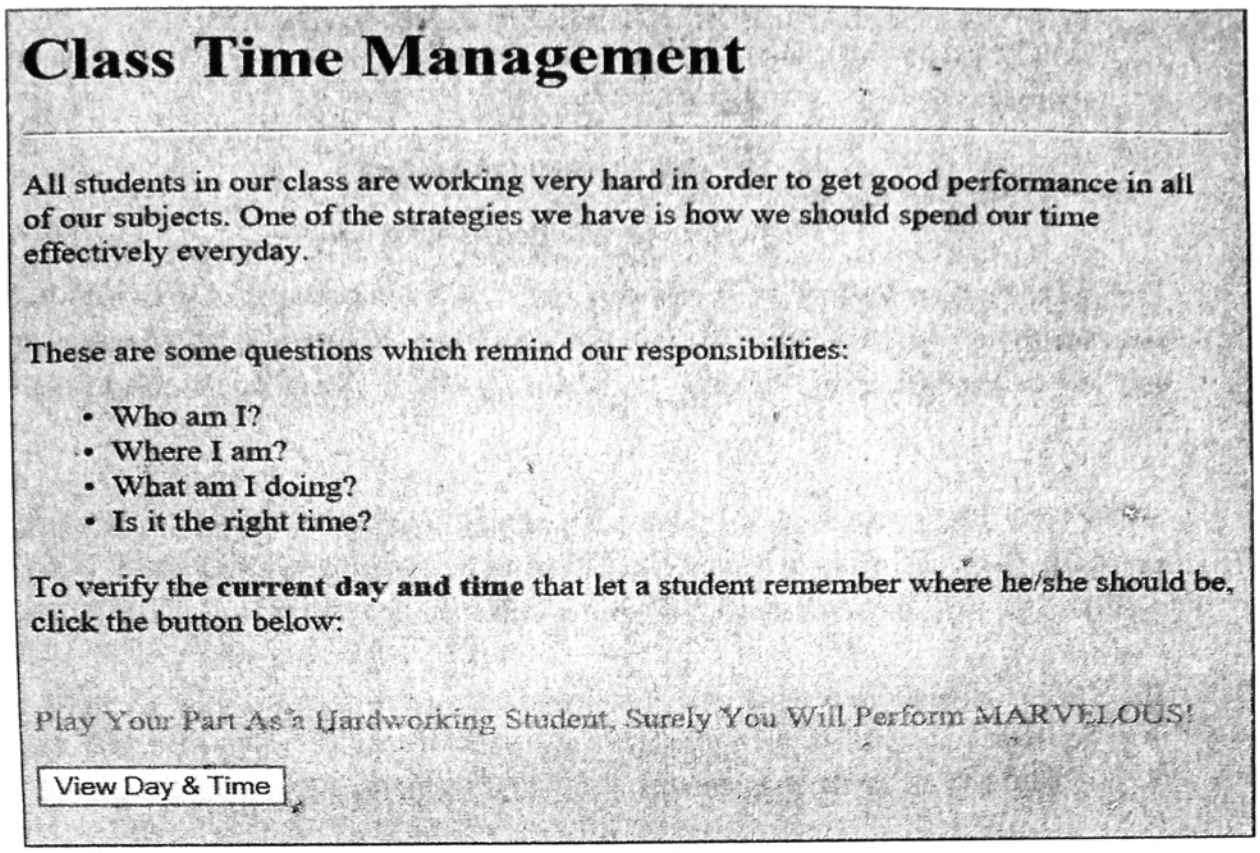

Figure 1

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).

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136/2

COMPUTER SCIENCE 2
(For Both School and Private Candidates)

Time: 3 Hours **Year: 2022**

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 unauthorized materials are **not** allowed in the examination room.
8. Type your **Examination Number** on every page of your softcopy work(s).

1. (a) In the year 2020, ABC Secondary School expanded its enrollment capacity twice higher than the normal rate. The increase in number of students made it difficult to manual calculation and report of academic performance for each student. Use an array concept to develop a C++ program which prompts a user to enter the number of students, student name and scores for the seven subjects. The program should compute total and average performance for each student.

(12 marks)

(b) The XVDF football Stadium has a total capacity of 200 to accommodate football fans. The stadium manager wants to keep track of the number of attended followers for each match in real time. You are assigned to develop a C++ program that read gender, count and display number of attended females, males, total followers and remained slots. The program must be able to print the message "*sorry the pitch is full*" when the count reaches maximum entries.

(13 marks)

2. (a) The director at Open Mind nursery school wants to develop the system that will assist teache to demonstrate the concept of vowels present in different names. The teachers also had challenges in counting the number of vowels in the names presented. You have been asked to develop a JavaScript function that will prompt students to enter the name in small letters and count the number of vowels present when the user clicks the button OK. Use message box given in Figure 1 to accomplish the task.

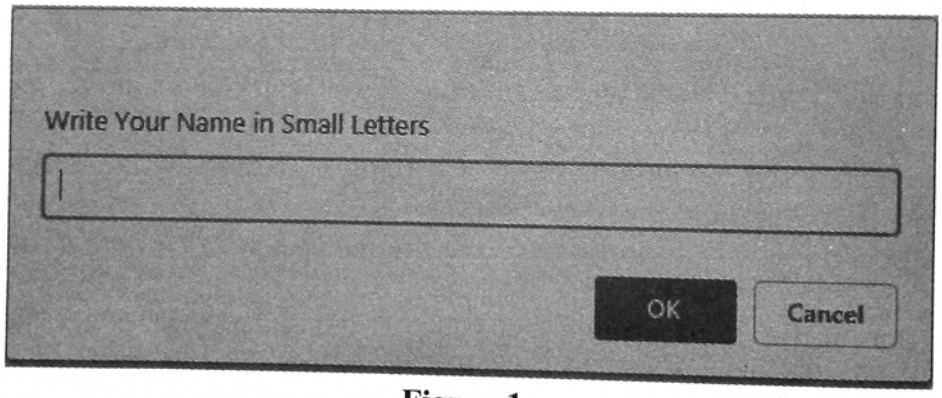

Figure 1

(b) The Wakwetu SACCOSS offers different types of loans to its members with annual interest rate of 12% per year. A member may request the loan with desired amount to be repaid within a period requested. The SACCOSS management is in need of a program to manage the loan processing;

(i) Design an interface using HTML which will enable the SACCOSS treasury to enter the loan amount, interest rate and repayment period in years.

(ii) Automate the interface with JavaScript such that, both the treasury and a member would get the loan repayment schedule upon when they click on the button "Loan Statement" as indicated in Figure 2.

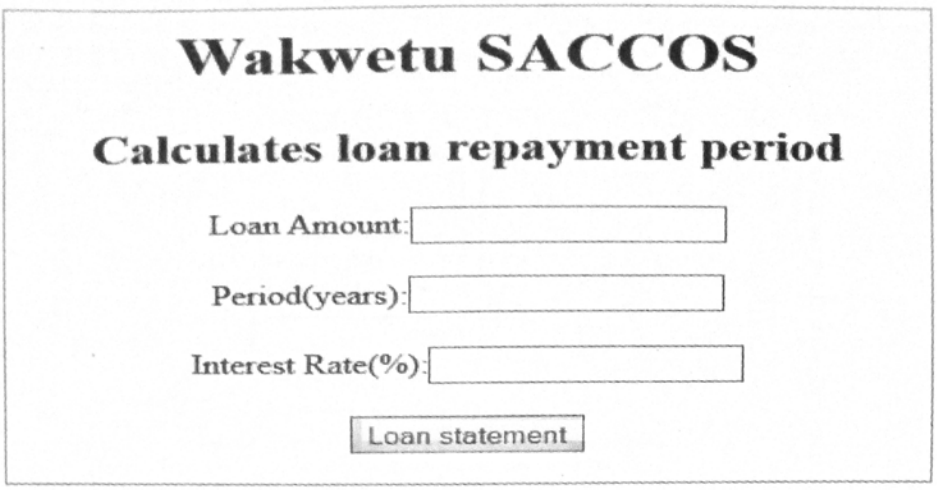

Figure 2

(25 marks)

3. Mwambe High School is facing the problem of tracking the movement of books in its Library. The library contains 250,000 numbers of reference books with large number of borrowers. The Librarian manage the registration of new books, borrowed books and returned books manually which led to redundancies of the data and even inconsistence of the recorded information. The analyst came up with many system interfaces which among them are presented in Figure 3, 4 and 5. The school director intends to design a computerized library management system in order to improve the services delivery in the library. Using a Visual Basic Program;

(a) Create interfaces shown in Figure 3.

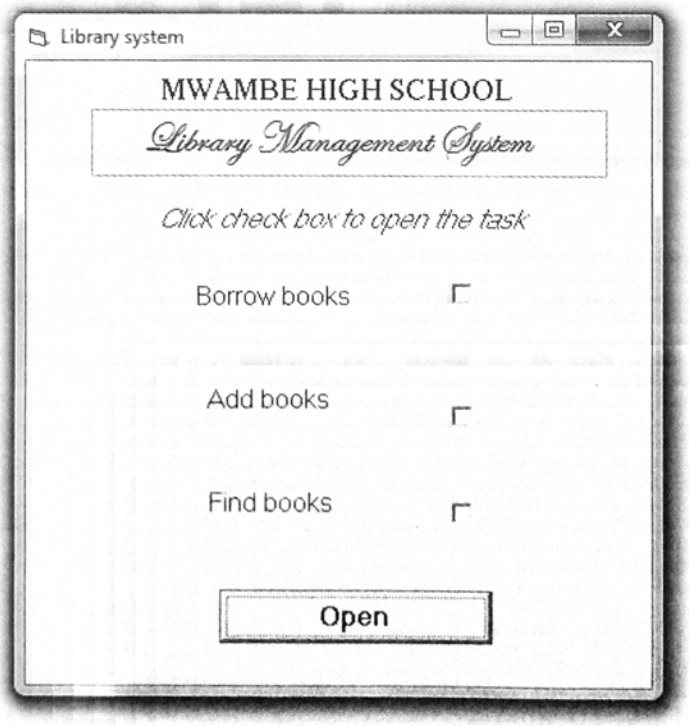

Figure 3: Home page

(b) Activate the button "Open" together with checkbox "Borrow books" in Figure 3 so that when the Librarian click the "Open" button the new form "Borrow Book" given in Figure 4 will open.

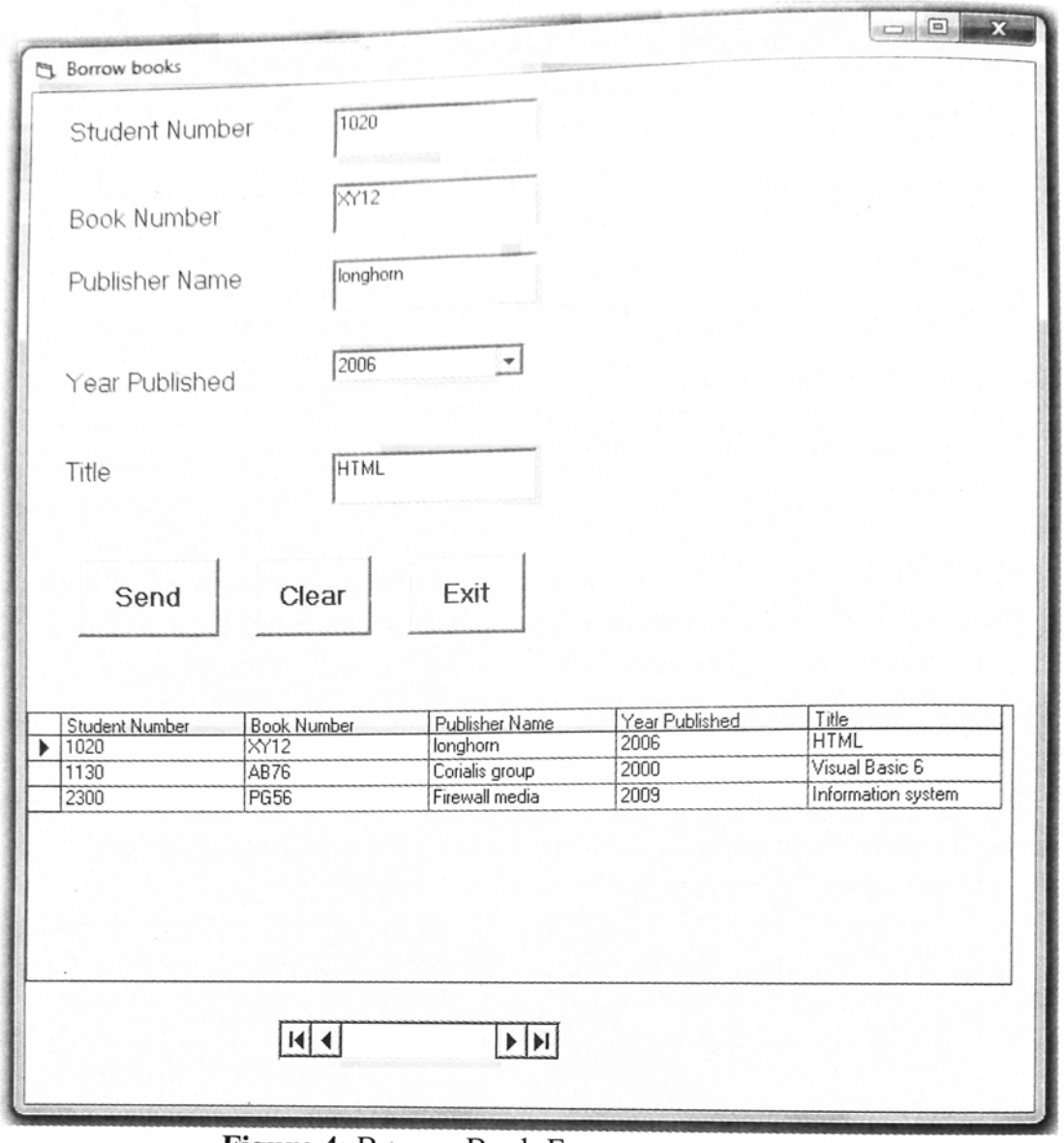

Figure 4: Borrow Book Form

(c) Reactivate the button "Open" by activating the checkbox "Add books" in Figure 3 so that when the Librarian click on "Open" button the new form "Add Books" given in Figure 5 will open.

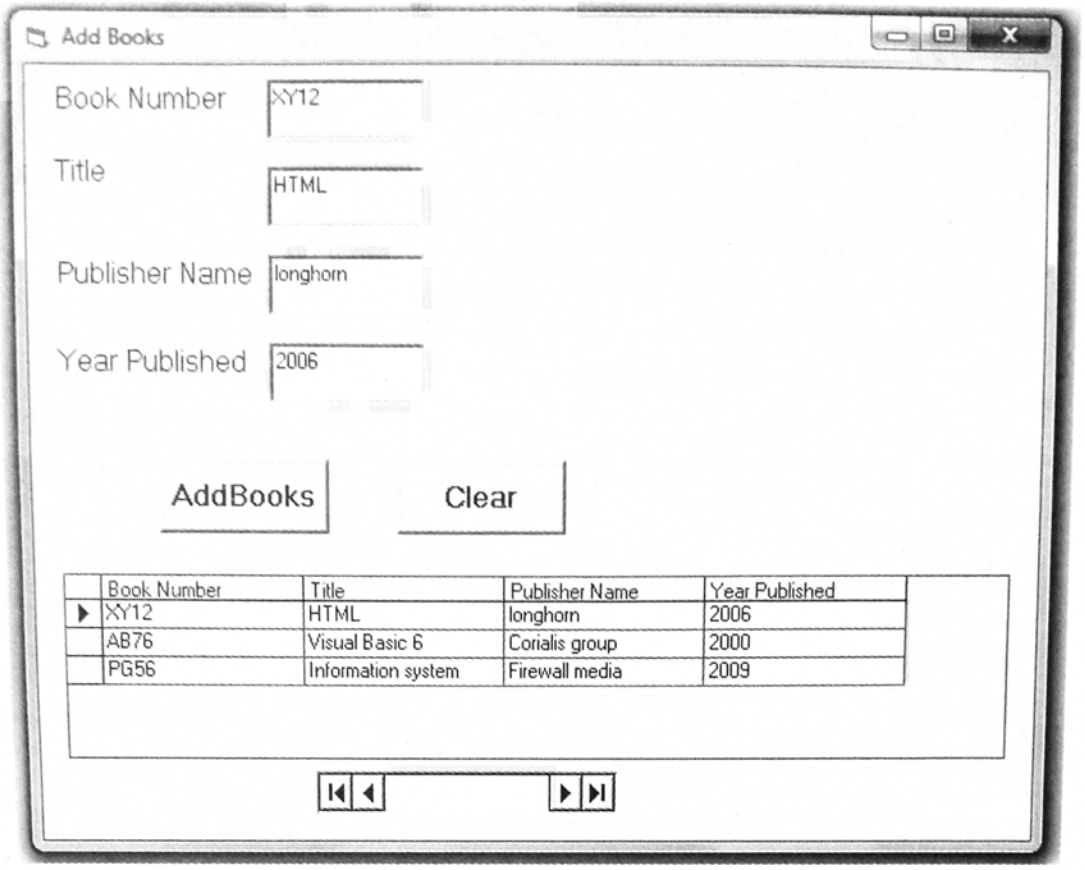

Figure 5: Add Book Form

(d) Reactivate the button "Open" by activating the checkbox "Find books" in Figure 3 so that the message "Enter the name of the book you are looking for" will appear in the message box when the Librarian clicks the "Open" button.

(e) Activate the combo box in Figure 4 to display years in numbers.

(f) Create a database named LibraryDB using Ms-access. Add two tables "borrowBooks" as displayed in Figure 4 and "AddBooks" as displayed in Figure 5.

(g) Activate the buttons in Figure 4 so that a user should;

(i) Click a button "Exit" to exit the form.

(ii) Click a button "Send" to send data from the form to the database and

(iii) Click a button "Clear" to reset the form data.

(25 marks)