THE UNITED REPUBLIC OF TANZANIA

NATIONAL EXAMINATIONS COUNCIL OF TANZANIA

ADVANCED CERTIFICATE OF SECONDARY EDUCATION EXAMINATION

136/2 **COMPUTER SCIENCE 2**

(For Both School and Private Candidates)

Time : 3 Hours **ANSWERS** **Year : 2018**

Instructions

1. This paper consists of **three (3)** questions.
2. Answer **two (2)** questions including question number **one (1)**.
3. Communication devices and any unauthorised materials are **not** allowed in the examination room.
4. Write your **Examination Number** on every page of your answer booklet(s).

Question 1 (a)

Use a function named *Functionlarger* to create a C++ program that determines the largest number from a set of 10 numbers entered by the user.

Answer:

To solve this, we create a function Functionlarger that accepts an array of numbers and returns the largest number. The main program will prompt the user to enter 10 numbers, store them in an array, and call the function to determine the largest number.

```
#include <iostream>

using namespace std;

// Function to determine the largest number

int Functionlarger(int arr[], int n) {

   int largest = arr[0];

   for(int i = 1; i < n; i++) {

      if(arr[i] > largest) {

         largest = arr[i];

      }

   }

   return largest;

}
```

```
int main() {
    int numbers[10];
    cout << "Enter 10 numbers: " << endl;
    for(int i = 0; i < 10; i++) {
        cin >> numbers[i];
    }
    int largest = Functionlarger(numbers, 10);
    cout << "The largest number entered is: " << largest << endl;
    return 0;
}
```

Explanation:

- The user is prompted to enter 10 numbers.
- These numbers are stored in an array.
- The function Functionlarger loops through the array, comparing each element, and keeps the largest one.
- Finally, the program prints the largest number.

Question 1 (b)

By using *Switch…Case* statement in C++ program, construct a menu-driven choice to calculate the area of triangle, rectangle or circle. The program should read the user's choice and execute accordingly.

Answer:

```
#include <iostream>

#include <cmath>

using namespace std;

int main() {

    int choice;

    float base, height, length, width, radius, area;

    cout << "Menu:" << endl;

    cout << "1. Area of Triangle" << endl;

    cout << "2. Area of Rectangle" << endl;

    cout << "3. Area of Circle" << endl;

    cout << "Enter your choice (1-3): ";

    cin >> choice;

    switch(choice) {

        case 1:

            cout << "Enter base and height of the triangle: ";

            cin >> base >> height;

            area = 0.5 * base * height;
```

```
        cout << "The area of the triangle is: " << area << endl;
        break;
    case 2:
        cout << "Enter length and width of the rectangle: ";
        cin >> length >> width;
        area = length * width;
        cout << "The area of the rectangle is: " << area << endl;
        break;
    case 3:
        cout << "Enter radius of the circle: ";
        cin >> radius;
        area = M_PI * radius * radius;  // M_PI is a constant for π
        cout << "The area of the circle is: " << area << endl;
        break;
    default:
        cout << "Invalid choice. Please select 1, 2, or 3." << endl;
}
```

```
    return 0;
}
```

Explanation:

- The program first shows a menu with three options: triangle, rectangle, or circle.
- The user selects their choice by entering 1, 2, or 3.
- Using a switch statement, the program reads the relevant dimensions: base and height for triangle, length and width for rectangle, radius for circle.
- It calculates and prints the area based on the selected shape.
- If the user enters an invalid option, it displays an error message.

Question 2 (a) (i)

Use Microsoft Excel program to create a workbook and save as *"Students Results"*. It should include different data such as Name, Physics, Computer, Advanced Mathematics, GS, Average, Remarks and Rank.

Answer:

In Microsoft Excel:

1. Open a new workbook and rename it as *Students Results*.
2. Create the following column headings: **Name, Physics, Computer, Advanced Mathematics, GS, Average, Remarks, Rank**.
3. Enter students' data under the respective columns (e.g., scores for each subject).
4. To calculate the **Average**, use the formula:

5. =ROUND(AVERAGE(B2:E2),0)

   where **B2:E2** contains the subject marks for the student. The ROUND function ensures the result is rounded to the nearest whole number.

6. To assign **Remarks**, use IF nested conditions according to the grading system. For example:

7. =IF(F2>=75,"Excellent",IF(F2>=65,"Very Good",IF(F2>=55,"Good",IF(F2>=45,"Fair",IF(F2>=35,"Pass","Fail")))))

   where **F2** is the Average column.

8. To determine **Rank**, use the RANK function:

9. =RANK(F2,$F$2:$F$11,0)

   This formula compares each student's average against the whole list.

Question 2 (a) (ii)

Use built-in functions to fill the column G, H and I for each student. The average should be automatically rounded off to the nearest whole numbers.

Answer:

- **Column G (Average):** =ROUND(AVERAGE(B2:E2),0)
- **Column H (Remarks):** Nested IF function as explained above.
- **Column I (Rank):** =RANK(F2,$F$2:$F$11,0)

Question 2 (b)

Open Microsoft Word program and create the mailing documents given in the next page. The text in the

form “text” represents the names of the merged fields. Use the worksheet created in part (a) above as the data source for mailing list. Save your work as *Academic Report* and Print a report for *Lee John* as well as *Jihad Ally*.

Answer:

Steps in Word:

1. Open Microsoft Word and choose **Mailings → Start Mail Merge → Letters**.
2. Go to **Mailings → Select Recipients → Use an Existing List**. Choose the Excel file *Students Results*.
3. In the letter body, type the report format and insert merge fields where appropriate. For example:
4. Academic Report
5. Student Name: «Name»
6. Physics: «Physics»
7. Computer: «Computer»
8. Advanced Mathematics: «Advanced_Mathematics»
9. GS: «GS»
10. Average: «Average»
11. Remarks: «Remarks»
12. Rank: «Rank»
13. Save the document as *Academic Report*.
14. Go to **Mailings → Finish & Merge → Edit Individual Documents**, select *Lee John* and *Jihad Ally*, and print their reports.

Question 3 (a)

Use HTML and JavaScript codes to create the following interface which will enable a user to type texts on text area and change its format after clicking a radio button.

Answer:

```
<!DOCTYPE html>

<html>

<head>

<title>Change Text Format</title>

</head>

<body>

<h1>Change Text Format</h1>

<textarea id="textArea" rows="10" cols="70"></textarea><br><br>

<input type="radio" name="format" onclick="changeText('bold')"> Bold

<input type="radio" name="format" onclick="changeText('italic')"> Italic

<input type="radio" name="format" onclick="changeText('underline')"> Underline

<script>

function changeText(style) {

    let textArea = document.getElementById("textArea");
```

```
    if (style === "bold") {
        textArea.style.fontWeight = "bold";
    } else if (style === "italic") {
        textArea.style.fontStyle = "italic";
    } else if (style === "underline") {
        textArea.style.textDecoration = "underline";
    }
}
</script>
</body>
</html>
```

Question 3 (b) (i)

Use basic HTML codes to create the following form.

```
<!DOCTYPE html>
<html>
<head>
<title>Student Form</title>
</head>
<body>
```

```
<h2>Registration Form</h2>

<form id="studentForm">

Name: <input type="text" name="name" id="name"><br><br>

Email: <input type="text" name="email" id="email"><br><br>

Age: <input type="number" name="age" id="age"><br><br>

<input type="submit" value="Submit">

</form>

</body>

</html>
```

Question 3 (b) (ii)

Use JavaScript codes to validate form inputs when the *Submit* button is clicked.

```
<script>

document.getElementById("studentForm").onsubmit = function(event) {

    let name = document.getElementById("name").value;

    let email = document.getElementById("email").value;

    let age = document.getElementById("age").value;



    if(name === "" || email === "" || age === "") {

        alert("All fields must be filled!");
```

```
        event.preventDefault(); // prevent form submission
    } else if(age < 1 || age > 120) {
        alert("Enter a valid age between 1 and 120!");
        event.preventDefault();
    } else if(!email.includes("@")) {
        alert("Enter a valid email address!");
        event.preventDefault();
    }
};
</script>
```