

## COMPUTER SCIENCE

**Date: 14/ 06/2024**  
**Period: 8:30 -11:30**



# END OF TERM III EXAMINATIONS QUESTION PAPER

**GRADE:** SENIOR FOUR (S4)

**LEVEL:** ADVANCED LEVEL

**COMBINATIONS:** -MATHEMATICS -COMPUTER SCIENCE-  
ECONOMICS (MCE)  
- MATHEMATICS -PHYSICS-COMPUTER  
SCIENCE (MPC)

**DURATION:** 3HOURS

**MARKS:**

...../100

CAMIS

..... /70

### INSTRUCTIONS

1)This paper consists of three sections.

**Section A:** Attempt **all 12** questions. (55marks)

**Section B:** Attempt **3** questions. (30marks)

**Section C:** Attempt **1** question. (15marks)

2)Use a **blue or black ink pen only** to write your answers.

**Section A: Attempt all 12 questions from this section (55marks)**

1. Why computer is said to be an electronic device? **(3 marks)**
2. List down the components of computer system. **(4 marks)**
3. Analyze why it is important to regularly blow out dust from a computer. **(4 marks)**
4. Explain why it is not advisable to take food substances and drinks in the computer lab. **(3 marks)**
5. Outline steps on how to access the disk management utility. **(4 marks)**
6. Workout the following expression **(8 marks)**
  - a)  $1110_2 + 1111_2$  **(2 marks)**
  - b)  $10101110_2 - 100110_2$  **(2 marks)**
  - c)  $17.125_{10} = ( \quad )_2$  **(4 marks)**
7. Is  $F(X,Y,Z) = X + YZ$  equal to  $F(X,Y,Z) = X + X + YZ$ ? **(5 marks)**  
Explain your answer.
8. List down any three rules to be followed while naming a variable **(6 marks)**
9. State any five features of C++ programming language. **(5 marks)**
10. Explain the differences between pre-increment and post-increment operators in C++. When would you use each one? **(4 marks)**
11. Match the function with its description. **(4 marks)**

Functions:

  - a) Data Management
  - b) Security
  - c) Resource Management
  - d) User Interface

Description:

  1. Provides access to and controls hardware resources.
  2. Allows users to interact with the system.
  3. Protects the system from unauthorized access.
  4. Manages storage of files and data.

12. What are the utility functions of the following tags and attributes  
**(5 marks)**
- a. <body> </body>
  - b. <marquee> </marquee>
  - c. Valign
  - d. Href
  - e. <hr>

**Section B: Attempt any (3) three questions from this Section (30marks)**

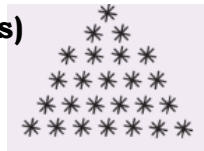
13. By using Pseudocode method, write an algorithm to swap two numbers  
**(10 marks)**
14. In Fibonacci series, the next number is the sum of the previous two Fibonacci numbers as shown below: 0,1,1,2,3,5,8,13,21,  
Based on the above scenario, write a C++ program that uses recursive function to output Fibonacci series from the first fifty natural numbers.  
**(10 marks)**
15. Using a sample program, demonstrate how you would use the get() function to read a string in as an array of characters. The output from the program should be displayed on the screen.  
**(10 marks)**
16. Differentiate between imperative, and functional programming paradigms.  
**(10 marks)**
17. Evaluate the difference between inline, internal, and external CSS.  
**(10 marks)**

**Section C: Attempt any (1) one question from this Section (15marks)**

18. Write an algorithm for the problems that allows the user to input three numbers and display the sum, the average, and their product. (Use for loop to input those numbers). **(15 marks)**

19. Create a C++ program that uses nested for loops and continue jump statement to format the following pattern: **(15**

**marks)**



20. The government of Rwanda is helping students wishing transfer from SCHOOL A to SCHOOL B. The students must send their request to NESA website using the form below. Write HTML code that displays this form.

**(15 marks)**

**BOARDING SCHOOL REQUEST FORM**

STUDENT ID:   
FIRST NAME:   
LAST NAME:   
AGE:   
SEX:   
PROVINCE:   
DISTRICT:   
SECTOR:   
MARKS:   
SCHOOL A:   
SCHOOL B:   
CLASS:   
PHOTO:

## COMPUTER SCIENCE

Date: 14/ 06/2024  
Period: 8:30 -11:30



# END OF TERM III EXAMINATIONS MARKING GUIDE

<b>GRADE:</b>	<b>SENIOR FOUR (S4)</b>	
<b>LEVEL:</b>	<b>ADVANCED LEVEL</b>	
<b>COMBINATIONS:</b>	-MATHEMATICS -COMPUTER SCIENCE- ECONOMICS ( <b>MCE</b> ) - MATHEMATICS -PHYSICS-COMPUTER SCIENCE ( <b>MPC</b> )	
<b>DURATION:</b>	<b>3HOURS</b>	
<b>MARKS:</b>	...../ 100 <b>CAMIS</b> <table border="1"><tr><td>..... /70</td></tr></table>	..... /70
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### INSTRUCTIONS

1)This paper consists of three sections.

**Section A:** Attempt **all 12** questions. **(55marks)**

**Section B:** Attempt **3** questions. **(30marks)**

**Section C:** Attempt **1** question. **(15marks)**

2)Use a **blue or black ink pen only** to write your answers.

**Section A: Attempt all 12 questions from this section (55marks)**

1. Why computer is said to be an electronic device? **(3 marks)**

Answer

Computer is said to be an electronic device because it is made up of electronic components and uses electric energy (such electricity) to operate.

2. List down the components of computer system. **(4 marks)**

Answer

Components of computer system are:

- Hardware
- Software
- Users
- Data

3. Analyze why it is important to regularly blow out dust from a computer. **(4 marks)**

Answer

- To reduce wear and tear due to friction
- To reduce crashing of sensitive devices like the hard disk, fan, and RAM.
- Leaving the dust intact, can be a hazard to your computer.

4. Explain why it is not advisable to take food substances and drinks in the computer lab **(3 marks)**

Answer

Drinks by drop on computer accessories causing short circuit or damage to electrical parts while solid food substances may cause clog moving parts or keys on the keyboard

5. Outline steps on how to access the disk management utility. **(4 marks)**

Answer

- a) Right click This PC icon,
- b) Click on Manage to display Computer management window
- c) Click Disk management under storage
- d) Right click the drive you wish to manage on the right pane

6. Workout the following expression **(8 marks)**

a)  $1110_2 + 1111_2$  **(2 marks)**

b)  $10101110_2 - 100110_2$  **(2 marks)**

c)  $17.125_{10} = ( \quad )_2$  **(4 marks)**

Answer

- a.  $11101_2$
- b.  $10001000_2$
- c.  $10001.001_2$

7. Is  $F(X,Y,Z) = X + YZ$  equal to  $F(X,Y,Z) = X + X + YZ$ ? **(5 marks)**  
Explain your answer.

Answer

- Yes.
- According to the identity law,  $X+X = X$ . Hence both statements can be written as:  $X + YZ$ .

8. List down any three rules to be followed while naming a variable **(6 marks)**

Answer

- Choose meaningful variable names that tell the reader of the program what the variable represents.
- Each variable in the same algorithm should be identified using a unique name.
- By convention, variable names should begin with a letter of the alphabet but may be followed by numbers.
- Avoid using variable names that may conflict with reserved or keywords used in most programming languages.
- Variable names made up of two or more words should not have space in between the words, instead combine the two words or use an underscore.

9. State any five features of C++ programming language. **(5 marks)**

Answer

- Portability
- Object-oriented programming
- Keywords
- Storage memory
- Identifiers
- Type checking
- Case sensitive
- Operators

10. Explain the differences between pre-increment and post-increment operators in C++. When would you use each one? **(4 marks)**

Answer

Pre-increment modifies the value and then uses it, while post-increment uses the current value first and then modifies it. Use pre-increment when the modified value is crucial, and post-increment when the original value matters.

11. Match the function with its description. **(4 marks)**

Functions:

- a) Data Management
- b) Security
- c) Resource Management
- d) User Interface

Description:

- 1. Provides access to and controls hardware resources.
- 2. Allows users to interact with the system.
- 3. Protects the system from unauthorized access.
- 4. Manages storage of files and data.

Answer

- a) 4
- b) 3
- c) 1
- d) 2

12. What are the utility functions of the following tags and attributes **(5 marks)**

- a. <body> </body>
- b. <marquee> </marquee>
- c. Valign
- d. Href
- e. <hr>

Answer

- a) <body> </body>:** Encloses the body (text and tags) of the document
- b) <marquee> </marquee>:** is used to move text in html
- c) Valign:** The vertical alignment of the contents of cell
- d) Href:** The URL of document to be linked to this one
- e) <hr>:** horizontal rule line



**Section B: Attempt any (3) three questions from this Section (30marks)**

13. By using Pseudocode method, write an algorithm to swap two numbers  
**(10 marks)**

Answer

```
BEGIN
SET variable_A=0; Temporary=0; Variable_B=0
PRINT "Please enter two numbers"
READ Variable_A;
READ Variable_B
Temporary = Variable_A;
Variable_A=Variable_B;
Variable_B=Temporary;
PRINT Variable_A,Variable_B;
```

14. In Fibonacci series, the next number is the sum of the previous two Fibonacci numbers as shown below: 0,1,1,2,3,5,8,13,21,  
Based on the above scenario, write a C++ program that uses recursive function to output Fibonacci series from the first fifty natural numbers.

**(10 marks)**

Answer

```
#include<iostream>

using namespace std;

int fibonacci(int n){
    if((n==1) || (n==0)) {
        return(n);
    }
    else {
        return(fibonacci(n-1)+fibonacci(n-2));
    }
}

int main(){
    int n,i=0;
```

```

cout<<"Enter number of terms for Fibonacci Series:";

cin>>n;

cout<<"The is the Fibonnaci Series";

while(i<n) {

cout<<" "<<fibonacci(i);

i++;

}

return 0;}

```

15. Using a sample program, demonstrate how you would use the get() function to read a string in as an array of characters. The output from the program should be displayed on the screen. **(10 marks)**

Answer

```

#include <iostream>
using namespace std;
int main(){
char Greeting[30];
cout << "Greet someone:";
cin.get(Greeting, 30); //enter 29 characters
cout << "Greetings:"<<Greeting<< endl;
return 0; }

```

16. Differentiate between imperative, and functional programming paradigms. **(10 marks)**

Answer

Imperative programming focuses on giving instructions to the computer on how to perform a task. Programs written in an imperative style typically have a series of steps or commands that the computer follows in order to execute the program. Imperative programming languages such as C, Java, and Python are designed to support this paradigm.

Functional programming, on the other hand, focuses on using functions to perform tasks. Programs written in a functional style are made up of a series of functions that take input and produce output, without any side effects or state

changes. Functional programming languages such as Haskell, Lisp, and Clojure are designed to support this paradigm.

17. Evaluate the difference between inline, internal, and external CSS.

**(10 marks)**

Answer

**Inline CSS:** Styling applied directly to an HTML element using the style attribute.

```
<p style="color: blue;">This is a paragraph with inline CSS.</p>
```

**Internal CSS:** Styling defined within the <style> element in the <head> section of an HTML document.

```
<style>
  p {
    color: blue;
  }
</style>
```

**External CSS:** Styling defined in a separate CSS file and linked to the HTML document using the <link> element.

```
<link rel="stylesheet" href="styles.css">
```

**Section C: Attempt any (1) one question from this Section (15marks)**

18. Write an algorithm for the problems that allows the user to input three numbers and display the sum, the average, and their product. (Use for loop to input those numbers). **(15 marks)**

Answer

```
Var number, I as integer
  Var sum, average, product as integer
  start
  Sum=0, product=1
  Write("enter numbers")
  for i=0 to 2 step 1
  read(number)
  sum=sum+number
  product=product*number
  end for
  average=sum/3
  write(sum)
  write(product)
  write(average)
  end
```

19. Create a C++ program that uses nested for loops and continue jump statement to format the following pattern: **(15 marks)**

Answer

```
#include <iostream>
using namespace std;
int main()
{
  int i,j,k;
  for(i=1; i<=7; i++)
  {
    if(i==3){
```

```

        continue;
    }
    for(j=6;j>=i;j--){
        cout<<" ";
    }
    for(k=1; k<=i; k++)
    {
        cout<<"* ";
    }
    cout<<"\n";
}
system("pause");
return 0;
}

```

20. The government of Rwanda is helping students wishing transfer from SCHOOL A to SCHOOL B. The students must send their request to NESAWEB website using the form below. Write HTML code that displays this form. **(15 marks)**

#### BOARDING SCHOOL REQUEST FORM

STUDENT ID:	<input type="text"/>
FIRST NAME:	<input type="text"/>
LAST NAME:	<input type="text"/>
AGE:	<input type="text"/>
SEX:	<input type="text" value="v"/>
PROVINCE:	<input type="text"/>
DISTRICT:	<input type="text"/>
SECTOR:	<input type="text"/>
MARKS:	<input type="text"/>
SCHOOL A:	<input type="text"/>
SCHOOL B:	<input type="text"/>
CLASS:	<input type="text" value="v"/>
PHOTO:	<input type="text"/> <input type="button" value="Browse..."/>
<input type="button" value="Send"/>	

```
<HTML> <b><caption>BOARDING SCHOOL REQUEST FORM
</caption><BR><BR></b> <form action="uploader.php" metho="post">
STUDENT ID:<input type ="text"><br> FIRST NAME:<input type="text"><br>
LAST NAME:<input type ="text"><br> AGE: <input type="text"><br> SEX:
<select><option>&nbsp;</option><option>male</option><option>female</opti
on><br ></select><br> PROVINCE:<input type="text"><br> DISTRICT:<input
type="text"><br> SECTOR:<input type="text"><br> MARKS:<input
type="text"><br> SCHOOL A: <input type="text"><br> SCHOOL B: <input
type="text"><br> CLASS:
<select><option>&nbsp;</option><option>s1</option><option>s2</option>
<option>s3</option><option>s4</option><option>s5</option>
<option>s6</option></select><br> PHOTO:<input name="uploadedfile"
type="file"/><br/> <input type ="submit" value="send"/> </FORM> </HTML>
```