



**COLLEGE OF ENGINEERING, SCIENCE & TECHNOLOGY (CEST)**

**SCHOOL OF ELECTRICAL & ELECTRONICS ENGINEERING**

**DIPLOMA IN ENGINEERING (ELECTRICAL)**

**EED540 – COMPUTER SYSTEM**

**FINAL EXAMINATION – SEMESTER 1, 2019**

**DAY/DATE: as per timetable. TIME: 3 HOURS 10 MINUTES**

**ROOM: as per timetable. MAXIMUM MARKS: 100**

**INSTRUCTIONS TO STUDENTS**

1. *There are Five (5) sections (A - E). All sections are compulsory.*
2. *Write your answers legibly in the answer booklet provided.*
3. *A time of three (3) hours is allowed to complete this paper. Extra 10 minutes allowed to read the paper.*
4. *You may use blue or black ball pen to write your answers.*
5. *Insert all written foolscaps, graph paper, drawing paper, etc. in their correct sequence and secure with string provided.*
6. *Write your student identification number on each page used.*
7. *Begin each section on a fresh new page and use both sides of the sheets.*
8. *No GSM mobiles or smartphones allowed during the examination*
9. **ALWAYS CHECK YOUR WORK BEFORE YOU LEAVE THE ROOM!**

## SECTION A: MULTIPLE CHOICE

[20 MARKS]

- Which one of the following statement is true about data types?
  - int and char are the only data types
  - Data types are used with identifiers
  - int can be used as the name of the variable
  - Values can be assigned to datatypes.
- Where does a `cin` stops its extraction of data?
  - By seeing a blank space
  - By seeing ()
  - Both a & b
  - None of the mentioned
- What are mandatory parts in function declaration?
  - Return type, function name
  - Return type, function name, parameters
  - Return type only
  - Parameters only
- Data transmitted to a function at runtime is referred to as the \_\_\_\_\_ of the function.
  - return value
  - body
  - arguments
  - structure
- Which programming language consists of only binary instructions such as 0s and 1s?
  - Assembly language
  - Booleans
  - Mnemonics
  - Machine language
- What will happen in this code?

```
int a = 100, b = 200;
int *p = &a, *q = &b;
p = q;
```

  - b is assigned to a
  - p now points to b
  - a is assigned to b
  - q now points to a

7. How many ways of passing a parameter are there in c++?  
A.1  
B.2  
C.3  
D.4
8. What is the scope of the variable declared in the user defined function?  
A. whole program  
B. only inside the {} block  
C. both a and b  
D. none of the mentioned
9. Programs written in low-level language usually execute \_\_\_\_\_ than programs written in high-level language.  
A. more accurately  
B. less accurately  
C. faster  
D. slower
10. What will you use if you are not intended to get a return value?  
A. Static  
B. Const.  
C. Volatile  
D. Void
11. Which keyword is used to access the variable in namespace?  
A. using  
B. dynamic  
C. const  
D. static
12. Which of the following is a correct comment?  
A. /\* Comments \*/  
B. \*\* Comment \*\*  
C. /\* Comment \*/  
D. { Comment }

13. Which of the following is considered an escape character?

- A. " "
- B. \
- C. ;
- D. /

14. Which of the following is illegal?

- A. `int *ip;`
- B. `String s, *sp = 0;`
- C. `int i; double* dp = &i;`
- D. `int *pi = 0;`

15. Which one of the following resembles written languages, such as English, and can be run on a variety of computer types. Eg. C, C++, Java.

- A. Assembly language
- B. High-level language
- C. Machine language
- D. Low-level language

16. Only the ..... can have access to the private members and private functions.

- A. data functions
- B. inline functions
- C. member functions
- D. member variables

17. Which looping process checks the test condition at the end of the loop?

- A. for
- B. while
- C. do-while
- D. if-else

18. In C++, the expression `sum = sum + 10` can be written as \_\_\_\_\_.

- A. `sum += 10`
- B. `sum += 10`
- C. `+sum = 10`
- D. `sum = 10+`

19. C++ provides the capability of using the same function name for more than one function, referred to as function \_\_\_\_\_.
- A. prototyping
  - B. interpreting
  - C. conditioning
  - D. overloading
20. Which of the following accesses the fiftieth element stored in array?
- A. `array[49];`
  - B. `array[50];`
  - C. `array(50);`
  - D. `array;`

## SECTION B: SHORT ANSWERS

[10 MARKS]

1. Why main function is special in C++? [1 mark]
2. What happens when the programmer tries to modify the contents of an array that is passed to a function that receives the array as a const. parameter? [1 mark]
3. What is the difference between constructors and destructors? [1 mark]
4. Why are comments required in a program? [1 mark]
5. Compare and contrast pass-by-reference and pass-by-value? [2 marks]
6. State the three general types of programming language with examples? [1 mark]
7. State the steps of a typical C++ development environment. [2 marks]
8. What is the difference between non local variable and global variable? [1 mark]

## SECTION B: PROGRAMMING OUTPUT

[25 MARKS]

1. What is the output by the following line of code? [1 mark]

---

```
1. cout << ( 8 * 4 * 2 + 6 ) / 2 + 4 * 2;
```

---

2. What is the output of the segment below? [1 mark]

---

```
5. for (i = 0; i <= 100; i++)
6. {
7.   robot.translate(1);
8. }
9. cout << i << endl;
```

---

3. What is the output from the code segment below? [1 mark]

---

```
5. int main()
6. {
7.   int x,y;
8.   int *ptr;
9.   x=100;
10.  ptr=&x;
11.  y=*ptr;
12.  cout<<("%d\n",y);
13.  return 0;
14. }
```

---

4. What is the output by the following program segment when function **f3** is called twice? [2 marks]

---

```
1. void f3 ()
2. {
3.   static int x = 0;
4.   x+=5;
5.   cout << x << endl ;
6. } // end function f3
```

---

5. What is the output by the following lines of codes?

[3 marks]

```
7. class CRectangle {
8.   int x, y;
9.   public:
10.  void set_values (int,int);
11.  int area () {return (x*y);}
12. };
13.
14. void CRectangle::set_values (int a, int b) {
15. x = a;
16. y = b;
17. }
18.
19. int main () {
20. CRectangle rect;
21. rect.set_values (3,4);
22. cout << "area: " << rect.area();
23. }
```

6. Study the following code segment.

```
5. int N = 7;
6. int i, x;
7. for (i = 1; i <= N; i++)
8. {
9.   cin >> x;
10.   cout << i << ". " << x << " ";
11.   if(i % 3 == 0) { cout << endl; }
12. }
13.   cout << endl;
```

a. What is displayed with the given input? Watch the endl characters.

[5 marks]

Input: 11    12    13    14    15    16    17

b. In terms of N, what is the value of the loop control variable upon termination?

[1 mark]



7. What is the output of this program?

[2 marks]

```
1. #include <iostream >
2. using namespace std;
3.
4. int main ()
5. {
6. int a= -1, b= -a;
7. int x,y;
8.
9. x = (a < 0) && (b < 0) || ( a < 0) && (b > 0);
10.    y = ( a<= 0) || (b >= 0)&&(a >= 0) || (b <=0);
11.
12.    cout << (x!=y)<< endl;
13.    return 0;
14. }
```

8. What is the output by the following segment of codes?

[4 marks]

```
10. int array[3][4] = {{4,5,6,7},{5,6,7,8},{6,7,8,9}};
11. for ( int i = 0; i < 3; i++)
12. {
13.    for (int j = 0; j < 4; j++)
14.    {
15.        cout << array[i][j] << " " ;
16.    }
17.    cout << endl;
18. }
```

9. What is the output by the following segment of codes?

[2 marks]

```
9. int x = 2;
10.
11. switch (x) {
12.    case 1: cout << "one ";
13.    break;
14.    case 2: cout << "two ";
15.    case 3: cout << "three ";
16.    default: cout << "none ";
17. }
```

10. What is the output by the following program segment when function **f1** is invoked?

[3 marks]

---

```
1. void f1 ()
2. {
3.   int x = 10;
4.   f2( x );
5.   cout << x << endl ;
6. } // end function f1
7.
8. void f2( int x )
9. {
10.  x += 10;
11.  cout << x << endl ;
12. } // end function f2
```

---

## SECTION D: DEBUG THE CODES

[25 MARKS]

For each of the given complete programs or program segments, determine if there is one or more error in the code. Write down the line number and describe the error or write the corrected form. For program segments only, assume the code appears in main and that using directives are provided.

1. The following code should declare an integer variable and assign it the value 6. Identify the error(s).

[2 marks]

---

```
1. int 2ndValue;  
2. 2ndValue = 6;  
3. cout >> "Second Value: " >> 2ndValue;
```

---

2. The following code should print; "x is not equal to 100". Identify the error(s).

[2 marks]

---

```
1. int x = 100  
2.  
3. cout << "x is: " << x << endl ;  
4.  
5. if ( x == 100 )  
6. {  
7. cout << "x is not equal to 100";  
8. }
```

---

3. The program segment should display student's grade. If passed, the code should print Passed.

Otherwise, the code should print both Failed and You must take this course again.

[2 marks]

---

```
1. if (grade >= 60 );  
2. cout << " Passed \n";  
3. else  
4. cout << " Failed \n";  
5. cout << "You must take this course again \n" ;
```

---

4. The following code computes the product of two numbers without the use of "\*" (multiplication) operator. The program compiles properly however, fails to display the correct output. Identify the error(s).

[3 marks]

---

```
1. int a = 5;
2. int 6;
3.
4. for (int i = 0; i < a; i++)
5. {
6.     product += a;
7. }
8. cout << product<<endl;
```

---

5. For the given class code, troubleshoot for syntax errors if there is any. Program should do additions of two numbers by the use of classes and functions.

[ 2 marks]

---

```
3. class Add
4. {
5. private
6. int a, b;
7. public
8. void values (int int);
9. int sum () {return (a+b);}
10. }
```

---

6. Find if there is any error(s) in the following C++ program.

[2 marks]

---

```
1. #include <iostream>
2. using namespace std;
3.
4. int main (){/* This is the main function
5. cout << " EED540 - Computer Systems"<<endl;
6. system( 'PAUSE' );
7. return 0;
8.
9. }
```

---

7. The for loop that follows should print array's values. Identify the error(s). [1 mark]

---

```
1. int array [ 10 ] = { 0 };
2. for ( int i = 0; i <= 10; i++ )
3. cout << array [ i ];
```

---

8. The program segment should accept input as integers and sum all the entered integers from the user until the sentinel value, -9, is entered. [2 marks]

---

```
1. int total = 0;
2. int input;
3. while ( input != -9)
4. {
5.     cin >> input;
6. total += input ;
7. }
```

---

9. The following code is meant to prompt the user for ten marks and display the total. Identify any syntax and logic errors you may encounter in this program: [4 marks]

---

```
1. include <iostream>
2. using namespace std
3. int main()
4. {
5.     int marks, total, counter;
6.     total = 0;
7.     counter = 0;
8.     while(counter <= 10)
9.         {
10.            cout << "Enter marks ; cin > marks;
11.            total = Marks;
12.            counter++
13.        }
14.     cout << "Total marks is " << total;
15.     System("pause");
16.     return 0;
17. }
```

---

10. The program should display a character entered by the user. Identify the error(s).

[5 marks]

---

```
1. #include <iostream >
2.
3. void display(int mychar);
4. int main ()
5. {
6. char alpha ;
7.     cout << " Enter  a  character  :  ";
8.     cin >> alpha ;
9.     display( alpha )
10.
11. } // end main
12.
13. void display( char mychar )
14. {
15.     cout << "You just entered the character: " << alpha << endl;
16.     return alpha;
17. } // end function display
18.
```

---

## SECTION E: PROGRAMMING

[20 MARKS]

Write a C++ program that prompts the user to enter an integer and compute its **factorial**. The program should test the validity of the user input and give the user three chances to enter the integer value. If the user fails to enter a valid number in all the three chance, the program should exit. If the user enters a valid number then the program should compute and display the factorial value. To do this, your program should have function with the prototype “`void factorial ()`” that calculates and passes the factorial of the integer to the function “`void display ()`”

-----THE END-----

