



COLLEGE OF ENGINEERING, SCIENCE & TECHNOLOGY (CEST)

SCHOOL OF ELECTRICAL & ELECTRONICS ENGINEERING

TRADE DIPLOMA IN ELECTRICAL ENGINEERING

EEE505 – COMPUTER SYSTEM

FINAL EXAMINATION – SEMESTER 1, 2017

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 [15 MARKS]

1. Where does a `cin` stops its extraction of data?
 - A. By seeing a blank space
 - B. By seeing ()
 - C. Both a & b
 - D. None of the mentioned
2. Which looping process is best used when the number of iterations is known?
 - A. while
 - B. do-while
 - C. for
 - D. all looping processes require that the iterations be known
3. The value 132.54 can represented using which data type?
 - A. bool
 - B. void
 - C. int
 - D. double
4. What will happen in this code?

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

 - A. b is assigned to a
 - B. p now points to b
 - C. a is assigned to b
 - D. q now points to a
5. How many ways of passing a parameter are there in c++?
 - A.1
 - B.2
 - C.3
 - D.4
6. 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

7. Where the return statement does returns the execution of the program?
- A. Main function
 - B. Caller function
 - C. Same function
 - D. None of the mentioned
8. What will you use if you are not intended to get a return value?
- A. Static
 - B. Const.
 - C. Volatile
 - D. Void
9. Which keyword is used to access the variable in namespace?
- A. using
 - B. dynamic
 - C. const
 - D. static
10. Which of the following is a correct comment?
- A. `*/ Comments */`
 - B. `** Comment **`
 - C. `/* Comment */`
 - D. `{ Comment }`
11. Which of the following is the boolean operator for logical AND?
- A. `&`
 - B. `&&`
 - C. `|`
 - D. `|&`
12. Every statement in C++ program should end with
- A. A full stop (.)
 - B. A Comma (,)
 - C. A Semicolon (;)
 - D. A colon (:)
13. Which of the following correctly declares an array?
- A. `int array[5];`
 - B. `int array;`
 - C. `array{5};`
 - D. `array array[5];`

14. The switch statement is also called as?
- A. Choosing structure
 - B. Selective structure
 - C. Certain structure
 - D. None of the mentioned
15. Which of the following accesses the hundredth element stored in array?
- A. `array[99];`
 - B. `array[100];`
 - C. `array(100);`
 - D. `array;`

SECTION B: SHORT ANSWERS [10 MARKS]

1. What #include statement do you put at the top of a program that does uses cin or cout? [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 a stream insertion and a stream extraction operator? [1 mark]
4. Why are comments required in a program? [1 mark]
5. What is the difference between while and do-while loop? [1 mark]
6. Compare and contrast pass-by-reference and pass-by-value? [1 mark]
7. In your own words explain the three general types of programming language with examples? [2 marks]
8. Describe how a linear search works. On average, how many comparisons must a linear search performs? [1 mark]
9. Why main function is special in C++? [1 mark]

SECTION B: PROGRAMMING OUTPUT [25 MARKS]

1. How many times does each loop execute? [2 marks]

```
for (i = 0; i <= 100; i++)  
{  
    robot.translate(1);  
}
```

2. Examine the code below. What (not how) does the following function do? [3 marks]

```
int mystery(int x, int y, int z)  
{  
    int temp; // ultimately, holds returned value  
    temp = x; // assume the largest is x  
    if (y > temp) { temp = y; }  
    if (z > temp) { temp = z; } return temp;  
}
```

3. What is the output from each code segment below? [2 marks]

```
int x = 1, y = 0;  
if (x > 0 && y < 0) {  
    x = y = 23; }  
cout << x << " " << y << endl;
```

4. Study the following code segment.

```
int N = 7;
int i, x;
for (i = 1; i <= N; i++)
{
    cin >> x;
    cout << i << ". " << x << " ";
    if(i % 3 == 0) { cout << endl; }
}
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]

5. What is the output from each code segment below? [1 marks]

```
x = 10; y = 40;
if (x >= 10)
{
    if (y < 40) { y++; }
    else { y--; }
}
cout << x << " " << y << endl;
```

6. What is output by the following segment? [6 marks]

```
int array[3][4] = {{9,8,7,6},{8,7,6,5},{7,6,5,4}};
for ( int i = 0; i < 3; i++)
{
    for (int j = 0; j < 4; j++)
    {
        cout << array[i][j] << " ";
    }
    cout << endl;
}
```

7. What is output by the following segment?

[2 marks]

```
int x = 6;
switch (x) {
case 1:
cout << "one ";
break;
case 2:
cout << "two ";
default:
cout << "none ";
}
```

8. What is output by the following segment?

[3 marks]

```
int n=10;
loop:
cout << n << ", ";
n--;
if (n>0) goto loop;
cout << "FIRE!\n";
return 0;
```

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 print; "q is not equal to 10".

[1 mark]

```
1. int q = 10;
2.
3. cout << "q is: " << q << endl ;
4.
5. if ( q = 10 )
6. {
7. cout << "q is not equal to 10";
8. }
```

2. 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.". [1 mark]

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

3. The following code should assign 6 to the fifth element in array: [1 mark]

```
1. array [ 5 ] = [ 6 ];
```

4. The for loop should initialize all array values to 1. [1 mark]

```
1. int array [ 10 ];
2. for ( int i = 0; i < 9; i++ )
3.     array [ i ] = 1;
```

5. For the program giving below, troubleshoot for syntax and logic errors if there is any. Program should compute the difference of two numbers by the use of functions. [4 marks]

```
1. // function example
2. #include <iostream>
3. using namespace std;
4. int subtraction (int a, int b)
5. {
6.     int r;
7.     r = a + b;
8.     return (r)
9. }
10. int main ()
11. {
12.     int x=5, y=3, z;
13.     z = subtraction (7,2);
14.     cout << "The first result is " << z '\n';
16.     cout << "The third result is " << subtraction (x,y) << '\n';
17.     system "PAUSE";
18.     return 0
19. }
```


6. An array should contain all the integers from 1 through 10, inclusive. [1 mark]

```
1. int array [ 11 ] = { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 };
```

7. The for loop that follows should print array's values: [1 mark]

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

8. The following code should declare an integer variable and assign it the value 6. [2 marks]

```
1.   int 2ndPosition
2.   2ndPosition = 6;
```

9. The program segment should accept inputs and sum integers from the user until the sentinel value, -4, is entered. [1 marks]

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

10. The program segment should input accept 16 integers from the user and calculate their total. [2marks]

```
1. int total = 0;
2. int count = 1;
3. int input ;
4.
5. while ( total <= 16 )
6.   {
7.     cin >> input ;
8.     total += input ;
9.     counter ++;
10.  }
```

11. The codes below should display three lines of text:

[2marks]

```
1. # include <iostream >
2. using namespace std;
3.
4. int main ()
5. {
6.     cout << " Before call to q1 .\n";
7.     q1 ();
8.     cout << " After call to q1 .\n";
9. } // end main
10.
11. // q1 definition
12. void q1 ()
13. {
14.     cout << " During call to q1 .\n";
15. } // end function q1
```

12. The program should display a character entered by the user:

[5 marks]

```
1. #include <iostream >
2.
3.
4.
5. int main ()
6. {
7.     char myChar ;
8.
9.     cout << " Enter a character : ";
10.    cin >> myChar ;
11.
12.    q4( myChar )
13. } // end main
14.
15. // q4 definition
16. void q4( char c )
17. {
18.     cout << "You just entered the character: " << myChar << endl;
19.     return myChar;
20. } // end function q4
```

13. The while loop mentioned should compute the product of all integers between 1 and 3, inclusive.

[3 marks]

```
1. int    j    = 1;
2. int    product    = 1;
3
4. while ( j < = 3 ) ;
5. product *= j;
6.
7.
```

SECTION E: PROGRAMMING [25 MARKS]

Write a C++ program to compute and print the product of two integers without the use of multiplication operator "*". Write a function "mul" that returns the product of two integers.

1. The program requires that two positive integers be input. Write a loop that allows several pairs of integers to be input during execution.
2. The program should contain one function "mul" that implements the multiplication algorithm.

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