SLIATE

SRI LANKA INSTITUTE OF ADVANCED TECHNOLOGICAL EDUCATION

(Established in the Ministry of Higher Education, vide in Act No. 29 of 1995)

Higher National Diploma in Information Technology
First Year, First Semester Examination – 2019
HNDIT 1103 - Structured Programming

Instructions for Candidates:	No. of questions	: 06
Answer five (05) questions only	No. of pages	: 05
	Time	: 03 Hours

Question 1

I.   State two differences between compiler and interpreter. (2 marks)

II. Name three constructs in structured programming. (3 marks)

III. Write down whether the following statements are true or false.
   a) C++ is an example for third generation computer language.
   b) **conio.h** header file invokes the commonly used functions like cout, cin.
   c) void is a standard data type in c++.
   d) cout<< statement is used to receive the data from key board.
   e) C++ Linker combine all object code files into single executable programs. (5 marks)

IV. What would be the output of the c++ code segments given below.
   a) cout<<5+2%2+3*2; (1 mark)
   b)
```
int a,b;
a=4;
b=a++ * ++a;
cout<<b<<endl;
cout<<a<<endl;
cout<<a++;
```
(3 marks)

V. Draw a flow chart to input amount of sales(S) and display the commission percentage according to the table given below.

Commission Percentage	Sales (S)
3%	Less than Rs.10001.00
4%	Greate or Equal to Rs. 10001.00 and Less than Rs. 100001.00
5%	Greate or Equal to Rs. 100001.00

(6 marks)

Question 2

I. State a usage of header files in c++.

(2 marks)

II. Evaluate the following expressions
   a) 2!=1*2
   b) 10>=(5-3)*2
   c) (4+3)<=5|| (2*3)>5
   d) !(5>2 && 3<2)

(4 marks)

III. Explain a difference between implicit type conversion (casting) and explicit type conversion (casting) using appropriate examples.

(4 marks)

IV. What would be the output of the program shown below?

```
int a=5;
int b=3;
int c=2;
cout<<a <<"\t" << b<<"\t"<< c<<endl;
a *= b;
cout<<a;
```

(4 marks)

V. Write c++ program to find and display the circumference and area of a circle for given radius input. Clearly mention constants and variables in your program.

(Note: Circumference of a circle=$2\pi r$, Area of a circle= $\pi r^2, \pi = 3.14$)   (6 marks)

Question 3

I. Write a syntax for nested if statement.

(2 marks)

II. Assume that p and q are valid int type variables. Consider the c++ code segment given below.

```
if(p==q){
        cout<<"111"<<endl;
}
if(p!=q){
        cout<<"222"<<endl;
}
if(p%q==1){
        cout<<"333"<<endl;
}
```

What would be the outputs if:

   a) p=5, q=3
   b) p=10, q=3

(3 marks)

III. What are the outputs of the code segment given below, when x=1,2,3?

```cpp
switch(x){
        case 1:
                cout<<"First"<<endl;
        case 2:
                cout<<"Second"<<endl; break;
        default:
                cout<<"Invalid input";
}
```

(4 marks)

IV. Write a c++ program to check whether the user entered value is positive or negative or zero).   (5 marks)

V. Write C++program to input value of the temperature(int) and display a message according to the table shown below.

Temperature (T)	Message
T>28	Hot
18<T<=28	Warm
T<=18	Cold

(6 marks)

Question 4

I. Write the general syntax of C++ do while loop.   (2 marks)

II. Explain the difference between 'while' and 'do while' loop.   (4 marks)

III. What would be the output of the c++ code segments given below?

a)
```cpp
for(int i=0;i<10;){
        i+=3;
        cout<<i<<" ";
        }
```

b)
```cpp
int i=0;
while(i<40){
        i=i+5;
        if(i>20){
                continue;
        }
        if(i==30){
                break;
        }
        cout<<i<<"\t";
}
```

(4 marks)

IV. Write a c++ program to display the following number pattern using for loop.

a)
```
1
12
123
1234
```

b)
```
*****
****
***
**
*
```
(4 marks)

V.   Write c++ program to find and display the square numbers between 1 to 1000 using while loop.
(Hint : Square numbers – 1,4,9,16,25……….961)
(6 marks)

Question 5

I.   State two difference between an array and a structure in c++.   (4 marks)

II.   Write c++ code segment to create an array called 'data' and add the data shown below.

Data →

H	E	L	L	O

(3 marks)

III. Write c++ code segment to store and print the index_No, name and age of a student using structures.   (5 marks)

IV.   What is the error in each of the expressions given below?   (2 marks)

a) char *x=20;

b) int *p;
   int *q;
   p=&q;

V.   What would be the output of the c++ code segments given below.   (6 marks)

a)
```
void main( ){
int a[3][2]={{2,3},{1,1},{5,5}};
int b[3][2]={{1,2},{2,4},{3,5}};
int c[3][2];
for(int i=0;i<3;i++){
        for(int x=0;x<2;x++){
                c[i][x]=a[i][x]+b[i][x];
                //cout<<a[0][1];
        }
}
for(int r=0;r<2;r++){
        cout<<c[r][r]<<endl;
}
}
```

b)
```cpp
void main( ){
double a[4]={10,20,30,40};
for(int i=0;i<sizeof(a)/sizeof(a[0]);i++){
        cout<<*(a+i)<<" ";
}
}
```

Question 6

I.   Explain the difference between global variable and local variable.   (2 marks)

II.   Derive the answer for the following C++ expressions.   (3 marks)
   a) sqrt(9);
   b) pow(2,3);
   c) strlen("Hello")   ;

III.   Explain the term "pass by reference" in c++ function calling.   (3 marks)

IV.   What would be the output of the c++ code segment given below.   (5 marks)

```cpp
int vChange(int arr[],int size){
        int index=0;
        int arrnext[5];
        int value;
        for(int i=size-1;i>=0;i--){
                arrnext[index++]=arr[i];
        }
        return arrnext[1];
}
void vFind(int& vx){
        cout<<vx*vx;
}


int main(){
        int arryvalues[5]={1,2,3,4,5};
        int var=vChange(arryvalues,5);
        cout<<(vChange(arryvalues,5))<<endl;
        vFind(var);
}
```

V.   You have been asked to write a c++ program to accept two integer numbers as input and out put the larger number. The program includes a function called findMax() that takes two numbers as parameters (using pass by value concept) and returns the larger value. Use main function to pass the accepted two values to findMax() as arguments and display the larger number which is obtained from findMax() function.   (7 marks)