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 – 2018
HNDIT 1103 - Structured Programming

Question 1

I. State two characteristics of a good algorithm. (2 marks)

II. Show how the following control structures can be represented in a flow chart.

   a) Sequence

   b) Selection

   c) Iteration (3 marks)

III. Explain why program translators are used when using high level programming languages. Name two types of programming language translators. (4 marks)

IV. State whether the following statements are true or false

   a) Content of the constant can't be changed during the execution of the c++ program

   b) String is a fundamental data type of C++.

   c) C++ comments are executed by the compiler to find the correct output of the program

   d) All computer languages must be translated into machine language before execution. (5 marks)

   e) **void** indicates that the function returns no value. (6 marks)

V. Draw a flow chart to find the maximum number of ten given numbers.

Question 2
(2 marks)

I. Why do we need **#include <iostream.h>** in c++ programming?

II. Mention three syntax errors with the reasons in the program shown below.

```
#include <iostream.h>
void Main() {
int 1$value;
cout<<"Please enter an integer: ";
cin<<1$value;
cout<<"Entered value is"<<1$value<<endl;
}
```

(3 marks)

III. What would be the output of the C++ code segment shown below.

```
int a=10;
int b=20;
cout<<a++;
b=a;
cout<<"It's going to compute\n value of b is\t<<b";
```

(4 marks)

IV. Derive the answer for the following C++ expressions.

    a) 5+6*3-3/1

    b) 6%2+3*(4+5)

    c) (5-2)*5%2

    d) 4+5%2+4

    e) 5+2!=2+5

(5 mark:

V. Write c++ program to find and display the Net Salary of the employee for the input bas
salary of the employee. Clearly define constants and variables in your program

Net Salary= Basic Salary - (EPF+ETF)

EPF= Basic Salary * EPF Rate

ETF = Basic Salary * ETF Rate

EPF Rate=10% (0.1)

ETF Rate=3% (0.03)

(6 mar

Question 3

I. Write the syntax of if-else and switch statement   (2 ma

II. What is the usage of switch statement in programming?   (3 ma

III. Write c++ program to check whether a number entered by the user is odd or even.

(4 m:

IV. Write C++ program to input total marks and display the grade according to the grad
system shown below.   (5 m

Total Marks	Grade
251-300	EXCELLENT

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201-250	GOOD
151-200	AVERAGE
0-150	BAD

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

a)

```cpp
int day=3;
switch(day){
case 1:cout<<"Monday"<<endl;break;
case 2:cout<<"Tuesday"<<endl; break;
case 3:cout<<"Wednesday"<<endl;
case 4:cout<<"Thursday"<<endl;
case 5:cout<<"Friday"<<endl;break;
default : cout<<"Invalid entry";
}
```

b)

```cpp
int count=5;
int value=6;
if(count%2==1 && count==value){
value+=count;
cout<<value;
}
else{
value*=count;
cout<<value;
}
```

Question 4

I. "Body of the Post Test Loop is executed at least once". Do you agree with this statement? Justify your answer (2 marks)

II. Write the general syntax of for loop. (3 marks)

III. State two differences between while loop and do while loop (4 marks)

IV. Write c++ code segment to compute and display the sum of integers from 1 to 50 using for loop (including 50). **(5 marks)**

V. Write C++ codes to display the followings using loops. **(6 marks)**

a)
```
*
**
***
****
*****
```

b)
```
5X1=1
5X2=10
5X3=15
..........
5X12=60 (Multiplication table of 5)
```

Question 5

I. a) What is an array? **(1 mark)**

b) Write c++ statement to declare a double type 2D array named 'values' **(2 marks)**

c) Write single line c++ statement to insert the data given below to constructed array (I.b) above. **(2 marks)**

6.5	7.5
3.5	8.5
2.5	9.5

II. a) State a difference between an ordinary variable and pointer variable. **(2 marks)**

b) Write a single line c++ statement to declare an integer variable x with the initial value 120. **(1 mark)**

c) Write c++ statement to declare a integer pointer y having the address of x. **(2 marks)**

III. a) What is the usage of structure in c++ programming? **(2 marks)**

b) Define a c++ structure called Books with the fields of title, author and price **(2 marks)**

IV. IV. What would be the output of the programs given below. **(6 marks)**

a)

```cpp
int main(){
    int values[4];
    int * p;
    p=values;
    *p=100;
    p++;
    *p=80;
    p=&values[2];
    *p=150;
    p=values+3;
    *p=90;
    int i=0;
    while(i<4){
        cout<<values[i]<<endl;
        i++;
    }
    return 0;
}
```

b)

```cpp
int main() {
    int arr1[5]={1,2,3,4,5} ;
    int arr2[5];
    for(int i=0;i<5;i++){
        arr2[i]=arr1[i]*5;
    }
    for(int i=0;i<5;i++){
        cout<<arr2[i]<<endl;
    }
    return 0;
}
```

Question 6

I. What is the purpose of using c++ functions?   (2 marks)

II. State a difference between "pass by reference" and "pass by value" terms in c++ functions.   (3 marks)

III. Mention any two errors in the function shown below.   (4 marks)

```cpp
void sum (double v1, v2){
    double v3=v1+v2;
    cout<< v3;
    return (v1*v3);
}
```

IV. What would be the output of the program shown below?   (5 marks)

```cpp
#include<iostream>
using namespace std;
int funA (int x, int y){
        if(x<y)
                return x;
        else
                return y;
        }
int  funB(int p, int q){
        if(p>q)
                return p;
        else
                return q;
        }
int main (){
        int a=100;
        int b=50;
        int c=40;
        int v1=funA(a,b);
        int v2=funB(b,c);
        cout <<v1<<endl<<v2;
}
```

V. Write c++ program that read loan amount, and interest rate. The program includes a function called calInterest() that takes a floating point argument as pass by value concept. Use calInterest() method to calculate the loan interest and return loan interest to main program. Use main program to display loan amount and loan interest. (*Calculate the loan interest by multiply loan amount with interest rate (0.1)*)   (6 marks)