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 – 2016

HNDIT 1103 - Structured Programming

IT 1003 – Introduction to Programming

Instructions:

Answer only FIVE (05) questions.

No. of questions : 06
No. of pages : 06
Time : Three Hours

Question 01

(i) Give two types of design tools which represent algorithm. [02 Marks]

(ii) Briefly explain the following terms related to Computer Programming Languages. [03 Marks]

a) Low Level Languages
b) High Level Languages
c) Language Translators

(iii) Draw symbols for following functions / actions used in flowcharts. [04 Marks]

a) Start / Stop
b) Input / Output
c) Process
d) Decision

(iv) Draw a flaw chart to output the smallest number of three given numbers. [05 Marks]

(v) Give short answer for each of the following questions considering C++. [06 Marks]

a) Which symbol is used to define a single line comment?
b) Which type of error is flagged when a program is in running state?
c) Which symbol is used to indicate the end of a statement?
d) Which header file is included to use cout and cin statements?
e) Which symbol is used to block multiple statements?
f) What is the extension of a C++ source code file?

Question 02

(i) Write input and output operators used in C++. [02 Marks]

(ii) Give the most suitable data type to hold the following data values. [03 Marks]

a) 'S'

b) 47.44128

c) 2,000,000

(iii) Briefly describe variables and constants. [04 Marks]

(iv) Write any five rules to follow in naming an identifier in C++. [05 Marks]

(v) Write a C++ programme to output the volume of a cylinder for the given radius and height.

(If the radius is r and height is h, then the volume v is $\pi r^2 h$. Here $\pi = 22/7$) [06 marks]

Question 03

(i) Clearly write the syntaxes for 'if-else' statement and 'switch' statement. [02 Marks]

(ii) Write the output of the following code segment. [03 Marks]

```
int m=55;
if (m>75) cout<<"A";
if (m>60) cout<<"B";
if (m>50) cout<<"C";
if (m>30) cout<<"D";
if (m>0) cout<<"F";
```

(iii) Write the output of the following code segment. [04 Marks]

```
int a=10, b=15, c=20;
if ( (a==20) || (b==25) && (c==20))
    cout<<"A";
else
    cout<<"B";
```

(iv) Write a C++ program to output the grade for given marks based on the following criteria.

Range	*Grade*
75 – 100	A
60 – 74	B
40 – 59	C
0 – 39	F

[05 Marks]

(v) Write a C++ program to read currency type and its value (in rupees) from user and return the equal value in rupees. The "switch" statement should be used in your code.

Value of each currency in Rupees is given below:

Currency	*Value in Rupees*
Dollar (USA)	143.76
Pound (UK)	206.74
Euro (EU)	162.48

Sample output is given below: (Sample input is bolded)

```
1. USA Dollar
2. UK Pound
3. EU Euro
Enter the number of the Currency Format: 2
Enter amount to convert: 5
Converted Value: 1033.7
```

[06 Marks]

Question: 04

(i) Briefly explain 'loop' and 'infinite loop'. [02 Marks]

(ii) Write the syntaxes of three (03) loop control structures supported by C++. [03 Marks]

(iii)State the use of the 'break' and 'continue' in loop control structures. [04 Marks]

(iv)Write a C++ program to display the following pattern. [05 Marks]

```
1
2 2
3 3 3
4 4 4 4
5 5 5 5 5
```

(v) Write the output of the following C++ program code segments. [06 Marks]

a)
```
int i=0;
while(i<3)
{
cout << i << endl;
i++;
}
```

b)
```
for(int x=1;x<5;x=x+2)
cout << x;
```

c)
```
for(int a=0;a>0;a++)
cout << "HNDIT \n";
```

Question 05

(i) Briefly describe the following terms (use simple diagrams). [02 Marks]

a) Array

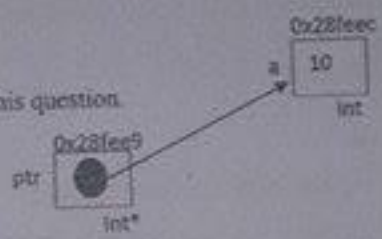
b) Pointers

(ii) Write a C++ programme to declare a 5 element integer array numList, assign values (entered by user) to the array, and then display the contents of the array. [03 Marks]

(iii) Determine the value of each of the indicated variables after the following code executes.

```
int a =10;
int* ptr = &a;
```

Refer to the following diagram to answer this question. [04 Marks]



a) &a

b) ptr

c) &ptr

d) *ptr

(iv) Write the output of the following C++ Program. [05 Marks]

```
#include <iostream.h>
void main()
{
    char* x="C++";
    cout<<"String is "<<x<<endl;
    cout<<"De-referenced char pointer is "<<*x<<endl;
    x++;
    cout<<"String after incrementing is "<<x<<endl;
    cout<<"De-referenced char pointer is now "<<*x<<endl;
    x++;
    cout<<"String after second incrementing is "<<x<<endl;
}
```

(v) Write the output of the following C++ Program. [06 Marks]

```
#include <iostream.h>
void main()
{
```

```
    cout << "Before swap, value of a :" << a << endl;
    cout << "Before swap, value of b :" << b << endl;
    swap(a, b);
    cout << "After swap, value of a :" << a << endl;
    cout << "After swap, value of b :" << b << endl;
}
```

(iv) Write a function definition maxNum(int,int) to return maximum value of two given integer arguments. [05 Marks]

(v) Write a function which accepts three arguments and assigns the sum of first two arguments into the third argument variable.

In the main method display the values of these three arguments before and after calling the above function.

(Use pass by value and pass by reference concept properly) [06 Marks]