



## Vavuniya Campus of the University of Jaffna

### First Examination in Information and Communication

#### Technology - 2017

First Semester - September/October 2018

#### ICT1132 Introduction to Program Design and Programming

Answer Four Questions Only

Time Allowed : **Two** hours

---

1. (a) Explain why would you prefer to write a program in a high-level language rather than a machine language. [15%]
- (b) Differentiate a *Compiler* and an *Interpreter*. [20%]
- (c) List down five programming paradigms. [20%]
- (d) State what is type casting in C++. [15%]
- (e) Rewrite the following C++ program after removing all the syntactical errors:

```
include<iostream>
define PI=3.14
void main( );{
    double r;a;
    cout<<'enter any radius';
    cin<<r;
    a==PI*pow(r,2);
    cout<<"Area="<<a }
```

[30%]

2. (a) Briefly explain the importance of logical operators in C++ with the aid of examples. [20%]

(b) Consider the following C++ code:

```
grade= marks >= 75 ? 'G' : marks >= 50 ? 'O' : marks >= 35 ? 'N' : 'F';
```

Rewrite the above code by replacing with a suitable if-else statement. [20%]

(c) Describe the switch structure using an example. [15%]

(d) Consider the problem to compute the factorial of a given number N ( i.e., N!).

where  $N! = 1 * 2 * 3 * 4 * \dots * N-1 * N$  and  $0!=1$ .

i. Write an algorithm and draw a flowchart to solve this problem. [30%]

ii. Write a C++ code segment for this task. [15%]

3. (a) Consider the following players' goal list obtained in FIFA 2018 world cup:

Name of the Player	Country	Number of Goals
Griezmann	France	4
Kukaku	Belgium	4
Mbappe	France	4
Rane	England	6
Ronaldo	Portugal	4

Write C++ statements to do each of the following tasks:

i. Store the above goal list information in an array. [10%]

ii. Find the highest goal player and print his name and country. [15%]

iii. List the France players' name. [10%]

[ This question is continued on the next page]

(b) Trace and write down the output of the following program:

```
#include <iostream>
using namespace std;
void Changethecontent(int Arr[], int Count) {
    for (int C=1;C<Count;C++)
        Arr[C-1]+=Arr[C];
}
void main() {
    int A[]={3,4,5},B[]={10,20,30,40},C[]={900,1200},L;
    Changethecontent(A,3);
    Changethecontent(B,4);
    Changethecontent(C,2);
    for (L=0;L<3;L++)
        cout<<A[L]<<"#";
    cout<<endl;
    for (L=0;L<4;L++)
        cout<<B[L] <<"#";
    cout<<endl;
    for (L=0;L<2;L++)
        cout<<C[L] <<"#";
}
```

[30%]

(c) Write a function in C++ to verify whether a given integer matrix with size 5x5 is a symmetric.

[20%]

(d) Describe the concept of pointers with the aid of an example.

[15%]



4. (a) Discuss the user defined function types and how to call those functions in a program. [20%]

(b) Explain the following terms with the aid of an example.

i. Local and Global variables

ii. Formal and actual parameters

iii. Function prototype and Function signature [30%]

(c) Consider the following C++ code to find the cube for a given integer:

```
#include<iostream>
using namespace std;
void main(){
    int N = 6;
    for (int i = 1,i <= N,i++)
        cout<<i " " <<cube(i)<<endl
}
int cube(int i){
    j = i * i * i;
    return j;
}
```

Identify the syntax errors, Rewrite the corrected program and its final output. [25%]

(d) Write a recursive function to reverse the digits in a given integer. [25%]

5. (a) Explain how *struct* is different from *class*. [20%]

(b) Write C++ statements to accomplish each of the following tasks:

i. Define a struct, `checkingAccount`, to store the following data about a checking account: account holders name (string), account number (int), balance (double), and the interest rate (double). [15%]

[ This question is continued on the next page]

- ii. Declare a `checkingAccount` variable and store the following information:  
 account holders name - Vavuniya Campus, account number - 17328910,  
 balance - 2405476.38, interest rate - 10.5%. [10%]
- iii. Write a function to print `checkingAccount` information. [15%]
- iv. Write a return function to read `checkingAccount` information from a user  
 and return its value. [20%]

(c) Consider the following C++ code:

```
#include <iostream>
using namespace std;
void Division(const double a, const double b);
int main(){
    double op1=10, op2=0;
    try{
        Division(op1, op2);
    }
    catch (const char* Str){
        cout << "\nBad Operator: " << Str;
    }
    return 0;
}

void Division(const double a, const double b){
    double res;
    if (b == 0)
        throw "Division by zero not allowed";
    res = a / b;
    cout << res;
}
```

- i. Trace and write down the output.
- ii. Find the output of the above code if `op1=0` and `op2=10`. [20%]