# DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
# UNIVERSITY OF BARISAL

**FINAL EXAMINATION-2018**
**Course Title: Programming Fundamental I**
**Course Code:** CSE-1103
1st Semester, 1st Year, Session: 2017-18

**Time:** 3 hours **Marks:** 60

**Answer any five Questions from the followings. Parts of the same question should be answered consecutively.**

1. a) Draw the flowchart to find and display the largest number among three different integer numbers entered by user. [3]
   b) What are compiler and interpreter? Write down the advantages and disadvantages of compiler and interpreter. [3]
   c) List and explain different features of C language. [3]
   d) Delineate the compiling and running process of a C program using a flow chart. [3]

2. a) Briefly describe the structure of a C program with example. [3]
   b) State the rules for naming *variable* in C language. Which of the following are invalid *variable* name and why? [3]
      i) *Float*
      ii) *1st_row*
      iii) *x1_x2*
      iv) *last-name*
   c) Distinguish between syntax errors and logical errors. [2]
   d) What do you mean by comment in C? Explain different types of comments in C with proper example. [2]
   e) For the following code, give the values that are printed out by each *printf* statement. Explain your answer. [2]

```
int x; /* This variable is global */
{
        int x = 23;
        printf ("%d\n", x );
        {
                printf("%d\n", x );
                x = 31;
        }
        printf("%d\n", x );
        x = 99;
}
{
        printf("%d\n", x);
}
```

3. a) What do you know about int and unsigned int? Why we use unsigned int? [3]
   b) What do you mean by constant in C? Briefly explain different ways of declaring constant in C with proper example. [3]
   c) Briefly describe the purpose of *typedef* keyword in C with proper example. [1.5]
   d) The following code fragment contains exactly one error that will be detected by a C compiler. Based upon the provide compiler error message, **fix the error** in the manner that you think the programmer intended. Assume that this code is found inside of a main function definition. [1]

```
int homework, midterm, final;
double wAverage;
scanf("%d%d%d", &homework, &midterm, &final);
waverage = 0.2 * homework + 0.3 * Midterm + 0.5 * final;
```

   e) Write a C program to check whether a triangle can be formed by the values of three sides. You should read the values of three sides from the keyboard. [3.5]

a) What do you mean by operator and operand? Describe different types of operators in C language with proper example. [1+3]

b) Briefly explain the ternary operator in C with proper example. [2]

c) Convert the following switch-case code to an if-else code. [2]

```
switch ( a )
{
    case 0:
    case 1:
        x = 50;
        break;

    case 2:
        x = 100;
        break;

    default:
        x = 0;
        break;
}
```

d) Write a program to check whether an integer number *N* is an Armstrong number or not. Note: A number is Armstrong if it is equal the sum of cube of its digits. For example, 371 is an Armstrong number because $371 = 3^3 + 7^3 + 1^3 = 27 + 343 + 1 = 371$. [4]

5. a) Explain different types of control statements in C language with proper examples. [3]

b) Convert the following while loop to an equivalent for loop. [2]

```
#include <stdio.h>
int main ()
  {
int x = 1;
int y;
        while ( x <= 10 )
        {
            y = x*x;
printf( "%d %d \n", x, y );
            x += 3;
        }
        return 0;
  }
```

c) Compare break and continue statements in terms of their functions. Use proper example for comparisons. [2.5]

d) Find and correct the errors in the following program. [1.5]

```
intx;
For ( x = 100; x >= 1; x-- )
Printf( "%d\n", x )
```

e) Develop a C program to calculate the sum of the series, $1^3 + 2^3 + 3^3 + \ldots\ldots + n^3$. Take the value of *n* from the keyboard. [3]

6. a) Find the output of the following C program (Show all the changes in the corresponding lines). [2]

```
#include<stdio.h>
int main()
{
int a[6] = {4, 3, 2, 7, 12, 11};
inti, j, m;
i = ++a[2];
  j = a[0]++;
  m = a[i++];
printf("%d, %d, %d", i, j, m);
  return 0;
}
```

Write a program to determine and print the sum of the following harmonic series for a given value of n: 04

$$1 + 1/2 + 1/3 + \ldots + 1/n$$

The value of n should be given interactively through the terminal.

c) Assume that the arrays A and B are declared as follows: 02

```
int A[5][4];
float B[4];
```

Find the errors (if any) in the following program segment;

```
int main(){
    int A[5][4];
    float B[4];
    int i; j;
    float k = 5.0/4.0;
    for(i=1;i<=5;i++)
        for(j=1;i<=4;j++)
            A[i][j] = 0;
    B[k] = 0;
    return 0; }
```

d) A and B are two matrices of size $M \times N$ each. Write a program to read the matrices A and B and print A+B. 04

7. a) What is recursion? Write a program to calculate the **factorial** of an integer number using a recursive function and return the value to the main function to display. [4]

b) What do you know about call by reference and call by value? Explain with examples. [3]

c) What is a pointer? Describe typical application of pointers in developing program. [2]

d) What is the output of the following segment? Why? [1]

```
int p[3];
    *( p + 2 ) = 500;
    *p = * ( p + 2 );
printf( "%d", p[0] );
```

e) What is the principal difference between the functions *malloc* and *calloc*? [2]

8. a) How does a *structure* differ from an *array*? 02

b) Why do we use *Unions* and *sizeof* operator? 03

c) Given the following declaration: 02

```
int x = 10, y = 10;
int *p1 = &x, *p2 = &y;
```

What is the value of each of the following expressions?

i. (*p1)++ ii. - - (*p2) iii. *p1+*p2 iv. ++(*p2) – *p1

d) What are the advantages of file in C? A file named "input.txt" contains texts. Write a program to copy the texts to another file "output.txt". 05