Victoria University
of Bangladesh

CSI 121 Final Exam - 2024

Structured Programming Language

SM Mithon Hossen
2121210031

Ans to the QS NO 1 (a)

A function is a block of code that performs some operation. A function can optionally define input parameters that enable callers to pass arguments into the function. A function can optionally return a value as output.

Syntax of a C function:

Code

```
return_type function_name (parameter_list){
// Function body with statements to be executed
}
```

Ans to the Qs No: 01(b)

C- program to find the largest numbers among three given numbers using a function;-

```
#include <stdio.h>
int findLargest(int a, int b, int c){
 if (a>=b && a>=c)
  return a;
 else if (b>=a && b>c)
  return b;
 else
  return c;
}
int main(){
 int num1, num2, num3;
 print ("Enter three numbers:");
```

```
    scanf ("%d %d %d", &num1, &num2, &num3);
    printf ("The largest number is: %d\n",
    findLargest (num1, num2, num3));
    return 0;
}
```

Ans to the Qs No - 1 (c)

Some of the key advantage of using functions are;

Enables reusability and reduces redundancy.

Makes a code modular.

Provides abstraction functionality.

The program becomes easy to understand and manage.

Breaks an extensive program into smaller and simpler pieces.

Ans to the Qs No. 2 (a)

Array is a collection of some data type. It is used to group same data type elements, such as a rollons, names of a class students etc. It is known as one of the data structure in C. To declate an array we should have prior info of data type and size of information.

Example :-

To store marks of 10 subjects we can declare 10 size array of float data type.

Ans to the Qs No. 2 (b)

C- program to find the average marks obtained by a class of 30 students in a structured Programming Language test.

```
#include <stdio.h>
 int main() {
 int marks[30], i, sum = 0;
 float average;
 printf ("Enter marks for 30 students: \n");
 for (i=0; i<30; i++) {
  scanf ("%d", &marks [i]);
  sum+ = marks [i];
 }
 average = sum /30.0;
 printf("The average marks are : %.2f.\n" average);
 return 0;
}
```

Ans to the Qs No - 2 (c)

⊞ Advantages of Arrays

Below are some advantages of the array:

In an ~~array~~ array, accessing an element is very easy by using the index number. The search process can be applied to an array easily. 2D Array is used to represent ~~mart~~ matrices. For any reason a user wishes to store multiple values of similar type then the Array can be used and utilized efficiently. Arrays have low overhead. C provides a set of built-in fuctions for manipulating arrays, such as sorting and searching. C supports arrays of multiple dimensions, which can be useful for repesenting complex data structures like matrices. Arrays can be easily converted to pointers, which allows for passing arrays to functions as arguments or returning arrys from Functions.

Ans to the Qs No. 3 (A)

C- program to calculate GCD for two positive integers:-

```
#include <stdio.h>

int gcd (int a, int b){
  if(b==0)
  return a;
return gcd (b, a%b);
}

int main() {
int num1, num2;
printf ("Enter two positive integers: ");
scanf ("%d %d", &num, &num2);
printf ("GCD of %d is: %d/n", num1, num2, gcd(num1, num2)
return 0;

}
```

Ans to the Qs No.- 3 (b)

The C-program to calculate the sum of the series using do statements: 225+227+229+...+255.

```
#include <stdio.h>
int main(){
int sum = 0, i = 225;
do{
do {
sum += i;
i+2 = 2;
} while (i<=255);
printf("The sum of the series is: %d \n", sum);
return 0;
}
```

Ans to the Qs No. 4 (a)

C-program to test if a year is a "Leap Year" or not;

```
# include <studio.h>
int main () {
 int year ;
 printf ("Enter a year :");
 scanf ("%d", & year);
if ((year %4 == 0 && year % 100! =0) || (year %400 == 0)
printf ("%d is a leap year. /n", year );
else
printf ("% d is not a leap year. */n", year);
return 0;
}
```

Ans to the Qs No 4 (b)

C program to calculate LCM for two positive integers;

```
# include <stdio.h>
 int gcd (int a, int b) {
  if (b == 0)
 return a;
 return gcd (b, a % b);
 }
 int lcm (int a, int b){
  return (a*b) / gcd (a,b);
 }
 int main () {
 int num1, num2;
 printf (" Enter two positive integers:");
```

```
scan("%d %d", &num1, &num2);
printf("LCM of %d and %d is: %d\n", num1,
num2, lcm(num1, num2));
return 0;
}
```