Computer Programming

End Semester Exam

Set - 8

Date: 26-03-2022

Max Marks: 24

- Answer all questions.
- Write your roll number and set number on top of each page.
- Save your scanned file with the name Setnumber_Rollnumber.pdf

(eg: Set8_S2021XXXXX.pdf)

1.

(a) Write a C program that computes $f(m, n) = \frac{m-n}{n!(m-n)!}$, where m and n are positive integers and m greater than n. You may write two user defined functions, one for f and another for factorial. **(5 Marks)**

(b) Complete the following code snippet for finding the minimum element in an array using recursion. Write the expressions A, B and C. **(3 Marks)**

```
#include<stdio.h>
#define MAX 100
int size=10;

int getMin(int a[])
{
        static int i = 0, min = 99999;
        if(i < ____A____)
        {
                if(____B____)
                        ____C____;
                i++;
                getMin(a);
        }
        return min;
}
```

2.

(a) Write a program to read the value of x and evaluate the following function,

$$Y = \begin{cases} 1 & \text{for } x > 0 \\ 0 & \text{for } x = 0 \\ -1 & \text{for } x < 0 \end{cases}$$

[4+4 Marks]

using else-if statement and nested if statement.

(b) Write a C program that reads the contents of a file and displays them in capital letters if they are alphabets.

3.

A. Fill in the blanks (a and b) by a suitable code so that the output of the program is -5 ?[1-mark]

```
1  #include <stdio.h>
2  int f(int *a  , int n)
3  {
4  if(n<=0) return 0;
5  else
6  if(*a%3==0) return *a + [    a    ];
7  else
8  return *a - f(a+1, [ b ]);
9  }
10
11  int main() {
12
13      int a[]={12, 7, 10, 4, 11, 6, 10,12,11};
14
15
16      printf("%d", f(a,9));
17
18      return 0;
19  }
```

B. What is the output of the below program? [1-mark]

```
1   #include<stdio.h>
2   int main()
3   {
4       char *ptr;
5       char string[] = "learn C from dennis ritchie book";
6       ptr = string;
7       ptr += 2;
8       ptr++;
9       printf("%s",--ptr);
10      return 0;
11  }
```

C. What is the output of the below program[2-mark]

```
1   #include<stdio.h>
2   int main(){
3       char *cities[] = {"India", "Taiwan", "Australia"};
4       int **i = &cities[0];
5       int **j = &cities[1];
6       int **k = &cities[2];
7       printf("%c%c%c\n", **i+1,**j-1,**k+1);
8       return 0;
9   }
```

D. What is the output of the below program?[1-mark]

```
1  #include <stdio.h>
2
3- int main() {
4      // Write C code here
5      struct s1
6-     {
7        char *z;
8        int i;
9        struct s1 *p;
10     };
11
12     struct s1 a[]={{"Bhopal",1, a+1},{"Delhi",2, a+2},{"Chennai",3, a}};
13
14     struct s1 *ptr=a+2;
15
16     printf("%s %s %s", a[0].z, ptr->z, a[2].p->z);
17
18
19     return 0;
20 }
```

E. What is the output of the below program? [1-mark]

```
1  #include <stdio.h>
2- int main() {
3      struct s
4-     {
5        char *z;
6        int i;
7        struct s *p;
8      };
9
10     struct s a[]={{"IIIT Sri City",1, a+2},{"IIIT Lucknow",2, a+1}
                    ,{"IIIT Raipur",3, a}};
11
12     struct s *ptr=a;
13     ++ptr;
14     printf("%s\n", ++(ptr->z));
15     printf("%s\n", a[(--ptr)->i].z);
16     printf("%s", a[--ptr->p->i].z);
17     return 0;
18 }
```

Output:

```
aths b 4 bms
```