Computer Programming
End Semester Exam

Set - 7

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: Set7_S2021XXXXX.pdf)

1. (a) Complete the following code snippet for finding the maximum element in an array using recursion. Write the expressions A, B, C and D. **(4 Marks)**

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

int getMax(int a[])
{
        static int i = 0, max =____A____;
        if(i < ____B____)
        {
                if(____C____)
                    ____D____;
                i++;
                getMax(a);
        }
        return max;
}
```

(b) Complete the following code snippet for finding the factorial using recursion. Write the expressions A, B, C and D. **(4 Marks)**

```
int fact(unsigned int n, unsigned int a)
{
   if (n == 0)
   {
      return ____A____;
   }
   else
   {
      return fact(____B____, ____C____);
   }

}

int factorial(unsigned int n);
{
   return fact(____D____, 1);
}
```

2. (a) Write a program to display the following pattern. [4+4 Marks]

```
1
123
12345
1234567
123456789
```

(b) Write a C program to create a text file and read the text from the created file and count the number of vowels and consonants present in the file.

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 + f(a+1, n-1);
7  else
8  return *a - [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]

```c
#include<stdio.h>
int main()
{
    char *ptr;
    char string[] = "learn C from dennis ritchie book";
    ptr = string;
    ptr += 2;
    ptr--;
    printf("%s",--ptr);
    return 0;
}
```

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

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

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

```c
#include <stdio.h>

int main() {
    // Write C code here
   struct s1
   {
    char *z;
    int i;
    struct s1 *p;
   };

   struct s1 a[]={{"Nagpur",1, a+1},{"Delhi",2, a+2},{"Chennai",3, a}

   struct s1 *ptr=a+2;

   printf("%s %s %s", a[0].z, ptr->z, a[2].p->z);


     return 0;
}
```

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

```c
#include <stdio.h>
int main() {
   struct s
   {
    char *z;
    int i;
    struct s *p;
   };

   struct s a[]={{"IIIT Sri City",1, a+2},{"IIIT Lucknow",2, a+1}
       ,{"IIIT Raipur",3, a}};

   struct s *ptr=a+1;
   ++ptr;
   printf("%s\n", ++(ptr->z));
   printf("%s\n", a[(--ptr)->i].z);
   printf("%s", a[--ptr->p->i].z);
     return 0;
}
```

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

```c
#include<stdio.h>
struct test
{
int i;
char *c;
};
struct test str[]={ 8, "abms", 8, "adsa", 7,"computer programming",3, "maths"
    4, "dbms"};

main()
{
 struct test *p=str+1;
 p++;

 printf("%s ", ++(p++->c));

 printf("%c ", *++p->c);

 printf("%d ", p[0].i);

 printf("%s ", p->c);
}
```

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