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NATIONAL INSTITUTE OF TECHNOLOGY GOA

Farmagudi, Ponda, Goa, 403401

Programme Name: B.Tech.

End Semester Examinations, April-2021

Course Name: Computer Programming and problem solving Course code: CS 100

Date: 10th April 2021 Time: 2.00 PM

Duration: 3 hours Max. Marks: 100

ANSWER ALL QUESTIONS

Part 1: Write a program for following questions. (5 x 10 =50 Marks)

1. Accept a month in digit from the user. Display the month in words. If number is not between 1 and 12 display message "Invalid Month". (Use 'switch').
2. Write a C program to swap first and second last digits of a number.

   Input: 12345 Output: 42315
3. Write a C program print to following pattern. (Input rows:5 columns:5)

   1 2 3 4 5
   2 3 4 5 5
   3 4 5 5 5
   4 5 5 5 5
   5 5 5 5 5
4. Write a C program print to following pattern. (Input rows:5 columns:5)

   12345
   23451
   34521
   45321
   54321
5. Write a C program to sort array using pointers.
   Input array elements: 10 -1 0 4 2 100 15 20 24 -5
   Array in ascending order: -5, -1, 0, 2, 4, 10, 15, 20, 24, 100
6. Write a C program to count characters, words and lines in a text file.
7. Write a C program to create a file and write contents, save and close the file.
8. Write a C program to add two complex numbers by passing structure to a function.

   Output:

   For 1st complex number

   Enter the real and imaginary parts: 2.1 -2.3

   For 2nd complex number

   Enter the real and imaginary parts: 5.6 23.2

   Sum = 7.7 + 20.9i
9. Write a C program to store the information (name, roll, marks) of 10 students using structure.
10. Write a C program for cyclic swap three numbers using pointer.

    Output:

    Enter a, b and c respectively: 1
    2
    3
    Value before swapping: a = 1 b = 2 c = 3
    Value after swapping: a = 3 b = 1 c = 2

Part 2: Write short note on following questions. (1*10=10 Marks)

1. Describe the header file and its usage in C programming?
2. What are the general description for loop statement and mention the available loop types in C?
3. What is the general form of function in C?
4. What is the incorrect operator form following list(== , <> , >= , <=) and what is the reason for the answer?
5. Is that possible to add pointers to each other?
6. Describe the meaning of "FILE *fp"?
7. What are the arguments of fopen()?
8. What is the in-built function in C Language to accept a Multi Word as Input?
9. How these two expressions **ptr++* and *++*ptr* are different?
10. What would be the equivalent pointer expression for referring the array element *a[i][j]* ?

Part 3: Write down the outputs with explanation of the following C codes. (2*20=40)

1.
```
#include<stdio.h>
void main()
{
   int a[5] = {5, 1, 15, 20, 25};
   int i, j, m;
   i = ++a[1];
   j = a[1]++;
   m = a[i++];
printf("%d, %d, %d", i, j, m);
}
```

2.
```
#include<stdio.h>
int fun(int n)
{
   int i, j, sum = 0;
   for(i = 1; i<=n; i++)
      for(j=i; j<=i; j++)
         sum=sum+j;
   return(sum);
}

int main()
{
   printf("%d", fun(15));
   getchar();
   return 0;
}
```

3.
```
#include <stdio.h>
int main()
{
   int a = 15, b;
   b = (a++) + (a++);
   a = (b++) + (b++);
   printf("a=%d b=%d", a, b);
   return (0);
}
```

4.
```
#include <stdio.h>
int main()
{
    char str[] = "neetsforneets";
    char *s1 = str, *s2 = str;
    int i;

    for(i = 0; i < 7; i++)
    {
      printf(" %c ", *str);
      ++s1;
    }

    for(i = 0; i < 6; i++)
    {
      printf(" %c ", *s2);
      ++s2;
     }

     getchar();
     return 0;
}
```

5.
```
int f(int x, int *py, int **ppz)
{
 int y, z;
 **ppz += 1;
  z  = **ppz;
 *py += 3;
  y = *py;
  x += 4;
  return x + y + z;
}

void main()
{
  int c, *b, **a;
  c = 4;
  b = &c;
  a = &b;
  printf("%d ", f(c, b, a));
  return 0;
}
```

6.
```
#include <stdio.h>
#define print(x) printf("%d ", x)
int x;
void Q(int z)
{
   z += x;
   print(z);
}
void P(int *y)
{
   int x = *y + 2;
   Q(x);
   *y = x - 1;
   print(x);
}
main(void)
{
   x = 5;
   P(&x);
   print(x);
}
```

7.
```
#include<stdio.h>
 void foo (char *x, char *y)
{
   char *t = x;
   x = y;
```

```
    y = t;
}

int main()
{
    char *x = "hai";
    char *y = "bye";
    char *t;
    foo(x, y);
    printf("(%s, %s)", x, y);
    t = x;
    x = y;
    y = t;
    printf("n(%s, %s)", x, y);
    return 0;
}
```

8. #include <stdio.h>

```
#define EVEN 0
#define ODD 1
int main()
{
    int i = 3;
    switch (i & 1)
    {
        case EVEN:
printf("Even");
            break;
case ODD: printf("Odd");
            break;
 default: printf("Default");
    }
    return 0;
}
```

9. #include<stdio.h>

```
int main()
{
  int n;
  for (n = 9; n!=0; n--)
    printf("n = %d", n--);
  return 0;
}
```

10. #include<stdio.h>

```
int main()
{
    int i = -5;
    while (i <= 5)
    {
        if (i >= 0)
            break;
        else
        {
            i++;
            continue;
        }
        printf("NIT");
    }
    return 0;
}
```

11. #include <stdio.h>

```
int main ()    {
 int sum = 0, maxsum = 0,  i,  n
= 6;
int a [] = {2, -2, -1, 3, 4, 2};
 for (i = 0; i < n; i++)    {
     if (i == 0 || a [i]  < 0  || a [i]
< a [i - 1])  {
                if (sum > maxsum)
                maxsum = sum;
        sum = (a [i] > 0) ? a [i] : 0;
           }
      else sum += a [i];
    }
 if (sum > maxsum)
maxsum =     sum ;
printf ("%dn", maxsum);
 }
```

12. #include <stdio.h>

```
int main ()
{
       int i, j;
       int a [8] = {1, 2, 3, 4, 5, 6,
7, 8};
       for(i = 0; i < 3; i++) {
           a[i] = a[i] + 1;
           i++;
       }
       i--;
       for (j = 7; j > 4; j--) {
            int i = j/2;
            a[i] = a[i] - 1;
       }
       printf ("%d, %d", i, a[i]);
}
```

13. #include <stdio.h>

```
int fun(char *p)
{
if (p == NULL || *p == '')
 return 0;
int current = 1, i = 1;
 while (*(p+current))
 {
  if (p[current] != p[current-1])
       {
           p[i] = p[current];
           i++;
       }
       current++;
    }
    *(p+i)='';
    return i;
}

int main()
{
    char str[] = "neetssteen";
    fun(str);
    puts(str);
    return 0;
}
```

14. #include <stdio.h>

```
int foo(int* a, int* b)
{
    int sum = *a + *b;
    *b = *a;
    return *a = sum - *b;
}
int main()
{
    int i = 0, j = 1, k = 2, l;
    l = i++ || foo(&j, &k);
    printf("%d %d %d %d", i, j,
k, l);
    return 0;
}
```

15. #include <stdio.h>

```
int main()
{
    int i;
    for (i = 1; i <= 10; i++) {
        printf("welcome\n");
        continue;
        printf("hii");
    }
    return (0);
}
```

16. #include <iostream>

```
int main()
{
    char i = 0;
    for (; i++; printf("%d", i)) ;
    printf("%d", i);
    return 0;
}
```

17.
```
#include <stdio.h>
 void main()
{
   int i = 0, j = 0;
   for (i = 0; i < 5; i++)
  {
     for(j = 0; j < 1;)
     {
       break;
       }
    printf("NIT \n");
   }
}
```

18.
```
#include<stdio.h>
struct {
            int i;
            float ft;
          }decl;
int main()
{
decl.i = 4;
decl.ft=7.96623;
printf("%d %.2f", decl.i, decl.ft);
return 0;}
```

19.
```
void main()
{
 struct leader{
            char *lead;
            int born;
            };
struct leader l1 = {"AbdulKalam", 1931};
struct leader l2 = l1;
printf("%s %d", l2.lead, l1.born);
 }
```

20.
```
int main()
{
   struct book
   {
             int pages;
             char name[10];
            }a;
a.pages=10;
strcpy(a.name,"Cbasics");
printf("%s=%d", a.name,a.pages);
 return 0;}
```