1. **What's the output of the following code ?**

```java
int doSomething(int a, int b)
{
if (b==1)
  return a;
else
  return a + doSomething(a,b-1);
}

   doSomething(2,3);
```

a)4
b)2
c)3
d)6

Ans d

2. **Select the correct output.**

```java
 int rec(int num){
  return (num) ? num%10 +
rec(num/10):0;
 }

  main(){

```

```
8 printf("%d",rec(4567));
  }
```

a) 4
b) 12
c) 22
d) 21

Ans. c

3. Choose correct option.

```
Java
1  int something(int number)
2  {
3   if(number <= 0)
4       return 1;
5   else
6       return number * something(number-
7  1);
8
9   }
10
    something(4);
```

a) 12
b) 24
c) 1
d) 0

Ans.b

4. **What will be the output**

```
int func(int a, int b){

  if(b==0)
     return 0;
  if(b==1)
     return a;


  return a + func(a,b-1);


 }
```

what will be the output of **func(3,8)** .
a) 11
b) 24
c) 22
d) 21

Ans.b

5. **What will be the output**

```
void print(int n)
{
 if (n == 0)
  return;

 printf("%d", n%2);
```

```
 print(n/2);
}
```

What will be the output of **print(12)**.
a) 0011
b) 1100
c) 1001
d) 1000

Ans.a

6. **What will be the output**

```
int sum(int n) {

  if (n==0)
    return n;
  else
    return n + sum(n-1);
}
```

What will be the output of **sum(8)**.
a) 40
b) 36
c) 8
d) 15

Ans.b

7. **What will be the output of the following C code?**

```c
#include<stdio.h>
main()
{
    int n;
    n=f1(4);
    printf("%d",n);
}
f1(int x)
{
    int b;
    if(x==1)
        return 1;
    else
        b=x*f1(x-1);
        return b;
}
```

a) 24
b) 4
c) 12
d) 10

Ans a

8. **What will be the output of the following C code?**

```c
#include<stdio.h>
main()
{
    int n,i;
    n=f(6);
    printf("%d",n);
}
f(int x)
{
    if(x==2)
            return 2;
```

```
    else
    {
        printf("+");
        f(x-1);
    }
}
```

a) ++++2
b) +++++2
c) +++++
d) 2

Ans. A

9. **How many times is ‘a’ printed when the following C code is executed?**

```
#include<stdio.h>
main()
{
    int a;
    a=f1(10);
    printf("%d",a);
}
f1(int b)
{
    if(b==0)
        return 0;
    else
    {
        printf("a");
        f1(b--);
    }
}
```

a) 9 times
b) 10 times
c) 0 times
d) Infinite number of times

Ans.d

10. What will be the output of the following C code?

```c
#include<stdio.h>
main()
{
    int n=10;
    int f(int n);
    printf("%d",f(n));
}
int f(int n)
{
    if(n>0)
        return(n+f(n-2));
}
```

a) 10
b) 80
c) 30
d) Error

Ans. c

11. What will be the output of the following C code?

```c
#include<stdio.h>
int main()
{
    printf("Hello");
    main();
```

```
    return 0;
}
```

a) Hello is printed once
b) Hello infinite number of times
c) Hello is not printed at all
d) 0 is returned

Ans.b

12. What will be the output of the following C code if the input given to the code shown below is “skillbout”?

```
#include<stdio.h>
#define NL '\n'
main()
{
    void f(void);
    printf("enter the word\n");
    f();
}
void f(void)
{
    char c;
    if((c=getchar())!=NL)
{
f();
    printf("%c",c);
}
return;
}
```

a) skillbout
b) infinite loop
c) tuoblliks
d) likstuobl

Ans. c

13.Predict output of following program

```
#include <stdio.h>

int fun(int n)
{
    if (n == 4)
       return n;
    else return 2*fun(n+1);
}


int main()
{
   printf("%d ", fun(2));
   return 0;
}
```

a. 4
b. 8
c. 16
d. Runtime error

Ans. C

14. Consider the following recursive function fun(x, y). What is the value of fun(4, 3)

```
int fun(int x, int y)
{
  if (x == 0)
    return y;
  return fun(x - 1,  x + y);
}
```

a. 13
b. 12
c. 9
d. 10

Ans. A

15. What does the following function do?

```
int fun(int x, int y)
{
    if (y == 0)   return 0;
    return (x + fun(x, y-1));
}
```

a. x+y
b. x+x*y
c. x*y
d. x^y

Ans c

16. **Output of following program**?

```
#include<stdio.h>
void print(int n)
{
    if (n > 4000)
        return;
    printf("%d ", n);
    print(2*n);
    printf("%d ", n);
}

int main()
{
    print(1000);
    getchar();
    return 0;
}
```

a. 1000 2000 4000

b. 1000 2000 4000 4000 2000 1000

c. 1000 2000 4000 2000 1000

d. 1000 2000 2000 1000

Ans. B

17.What does the following function do?

```
int fun(unsigned int n)
{
    if (n == 0 || n == 1)
        return n;

    if (n%3 != 0)
        return 0;

    return fun(n/3);
}
```

a. It returns 1 when n is a multiple of 3, otherwise returns 0
b. It returns 1 when n is a power of 3, otherwise returns 0
c. It returns 0 when n is a multiple of 3, otherwise returns 1
d. It returns 0 when n is a power of 3, otherwise returns 1

Ans. B

18.What will be the Output of following program?

```
#include <stdio.h>
int fun(int n, int *f_p)
{
    int t, f;
    if (n <= 1)
```

```
    {
        *f_p = 1;
        return 1;
    }
    t = fun(n- 1,f_p);
    f = t+ * f_p;
    *f_p = t;
    return f;
}

int main()
{
    int x = 15;
    printf (" %d n", fun(5, &x));
    return 0;
}
```

a. 6
b. 8
c. 14
d. 15

Ans. B

19.Consider the following C function:

```
int f(int n)
{
   static int i = 1;
   if (n >= 5)
      return n;
   n = n+i;
   i++;
   return f(n);
}
```

The value return by f(1) is

a. 5
b. 6
c. 7
d. 8

Ans c

20. What will be the output

```
void my_recursive_function()
{
   my_recursive_function();
}
int main()
{
   my_recursive_function();
   return 0;
}
```

a) The code will be executed successfully and no output will be generated
b) The code will be executed successfully and random output will be

generated
c) The code will show a compile time error
d) The code will run for some time and stop when the stack overflows

Ans .d

21. What is the output of the following code?

```
void my_recursive_function(int n)
{
    if(n == 0)
    return;
    printf("%d ",n);
    my_recursive_function(n-1);
}
int main()
{
    my_recursive_function(10);
    return 0;
}
```

a) 10
b) 1
c) 10 9 8 ... 1 0
d) 10 9 8 ... 1

Ans. D

22. What is the base case for the following code?

```
void my_recursive_function(int n)
```

```
{
     if(n == 0)
     return;
     printf("%d ",n);
     my_recursive_function(n-1);
}
int main()
{
     my_recursive_function(10);
     return 0;
}
```

a) return
b) printf(“%d “, n)
c) if(n == 0)
d) my_recursive_function(n-1)

Ans. C

23. How many times is the recursive function called, when the following code is executed?

```
void my_recursive_function(int n)
{
     if(n == 0)
     return;
     printf("%d ",n);
     my_recursive_function(n-1);
}
int main()
{
     my_recursive_function(10);
     return 0;
}
```

a) 9
b) 10
c) 11
d) 12

Ans. C

25. What does the following recursive code do?

```
void my_recursive_function(int n)
{
     if(n == 0)
     return;
     my_recursive_function(n-1);
     printf("%d ",n);
}
int main()
{
     my_recursive_function(10);
     return 0;
}
```

a) Prints the numbers from 10 to 1
b) Prints the numbers from 10 to 0
c) Prints the numbers from 1 to 10
d) Prints the numbers from 0 to 10

Ans c

26. will be the output of the following code?

```
int cnt=0;
void my_recursive_function(int n)
{
```

```
     if(n == 0)
     return;
     cnt++;
     my_recursive_function(n/10);
}
int main()
{
     my_recursive_function(123456789);
     printf("%d",cnt);
     return 0;
}
```

a) 123456789
b) 10
c) 0
d) 9

Ans d

27. What will be the output of the following code?

```
void my_recursive_function(int n)
{
    if(n == 0)
    {
         printf("False");
         return;
    }
    if(n == 1)
    {
         printf("True");
         return;
    }
    if(n%2==0)
    my_recursive_function(n/2);
    else
    {
```

```
            printf("False");
            return;
        }

}
int main()
{
     my_recursive_function(100);
     return 0;
}
```

a) True
b) False

Ans. B

28. What is the output of the following code?

```
int cnt = 0;
void my_recursive_function(char *s, int i)
{
     if(s[i] == '\0')
        return;
     if(s[i] == 'a' || s[i] == 'e' || s[i] == 'i' || s[i] ==
'o' || s[i] == 'u')
     cnt++;
     my_recursive_function(s,i+1);
}
int main()
{
     my_recursive_function("thisisrecursion",0);
     printf("%d",cnt);
     return 0;
}
```

a) 6
b) 9

c) 5
d) 10

Ans. a

29. What is the output of the following code?

```
void my_recursive_function(int *arr, int val, int idx, int
len)
{
    if(idx == len)
    {
         printf("-1");
         return ;
    }
    if(arr[idx] == val)
    {
         printf("%d",idx);
         return;
    }
    my_recursive_function(arr,val,idx+1,len);
}
int main()
{
     int array[10] = {7, 6, 4, 3, 2, 1, 9, 5, 0, 8};
     int value = 2;
     int len = 10;
     my_recursive_function(array, value, 0, len);
     return 0;
}
```

a) 3
b) 4
c) 5
d) 6

Ans. b

30. Consider the following iterative implementation to find the factorial of a number. Which of the lines should be inserted to complete the below code?

```
int main()
{
    int n = 6, i;
    int fact = 1;
    for(i=1;i<=n;i++)
      __________;
    printf("%d",fact);
    return 0;
}
```

a) fact = fact + i
b) fact = fact * i
c) i = i * fact
d) i = i + fact

And. B

31.Consider the following recursive implementation to find the factorial of a number. Which of the lines should be inserted to complete the below code?

```
int fact(int n)
{
     if(__________)
        return 1;
     return n * fact(n - 1);
}
int main()
{
      int n = 5;
```

```
      int ans = fact(n);
      printf("%d",ans);
      return 0;
}
```

a) n = 0
b) n != 0
c) n == 0
d) n == 1

Ans. C

32.The time complexity of the following recursive implementation to find the factorial of a number is _____

```
int fact(int n)
{
     if(_________)
        return 1;
     return n * fact(n - 1);
}
int main()
{
      int n = 5;
      int ans = fact(n);
      printf("%d",ans);
      return 0;
}
```

a) O(1)
b) O(n)
c) $O(n^2)$
d) $O(n^3)$

Ans. B

33. Consider the following recursive implementation to find the factorial of a number. Which of the lines is the base case?

```
int fact(int n)
{
     if(n == 0)
        return 1;
     return n * fact(n - 1);
}
int main()
{
      int n = 5;
      int ans = fact(n);
      printf("%d",ans);
      return 0;
}
```

a) return 1
b) return n * fact(n-1)
c) if(n == 0)
d) if(n == 1)

Ans. C

34. What is the output of the following code?

```
int fact(int n)
{
      if(n == 0)
        return 1;
      return n * fact(n - 1);
}
int main()
{
      int n = 0;
      int ans = fact(n);
      printf("%d",ans);
```

```
        return 0;
}
```

a) 0
b) 1
c) 2
d) 3

Ans. B

35. What is the output of the following code?

```
int fact(int n)
{
        if(n == 0)
          return 1;
        return n * fact(n - 1);
}
int main()
{
        int n = 1;
        int ans = fact(n);
        printf("%d",ans);
        return 0;
}
```

a) 0
b) 1
c) 2
d) 3

Ans b

36. What is the output of the following code?

```
int fact(int n)
{
      if(n == 0)
        return 1;
      return n * fact(n - 1);
}
int main()
{
      int n = 5;
      int ans = fact(n);
      printf("%d",ans);
      return 0;
}
```

a) 24
b) 120
c) 720
d) 1

Ans. B

37. Consider the following iterative solution to find the sum of first n natural numbers:

```
#include<stdio.h>
int get_sum(int n)
{
      int sm = 0, i;
      for(i = 1; i <= n; i++)
        _________;
      return sm;
}
int main()
{
    int n = 10;
```

```
    int ans = get_sum(n);
    printf("%d",ans);
    return 0;
}
```

Which of the following lines completes the above code?
a) sm = i
b) sm += i
c) i = sm
d) i += sm

Ans. B

38. What is the output of the following code?

```
#include<stdio.h>
int get_sum(int n)
{
      int sm, i;
      for(i = 1; i <= n; i++)
        sm += i;
      return sm;
}
int main()
{
    int n = 10;
    int ans = get_sum(n);
    printf("%d",ans);
    return 0;
}
```

a) 55
b) 45
c) 35
d) Depends on compiler

Ans d

39. What is the output of the following code?

```c
#include<stdio.h>
int recursive_sum(int n)
{
      if(n == 0)
        return 0;
      return n + recursive_sum(n - 1);
}
int main()
{
     int n = -4;
     int ans = recursive_sum(n);
     printf("%d",ans);
     return 0;
}
```

a) 0
b) -10
c) 1
d) runtime error

Ans. D

40.Consider the following iterative implementation to find the sum of digits of a number:

```c
#include<stdio.h>
int sum_of_digits(int n)
{
      int sm = 0;
      while(n != 0)
      {
```

```
            __________;
            n /= 10;
        }
        return sm;
}
int main()
{
        int n = 1234;
        int ans = sum_of_digits(n);
        printf("%d",ans);
        return 0;
}
```

Which of the following lines should be inserted to complete the above code?

a) sm += n

b) sm += n%10

c) sm += n-10

d) sm += n/10

Ans b

41. What is the output of the following code?

```
#include<stdio.h>
int cnt =0;
int my_function(int n, int sm)
{
        int i, tmp_sm;
        for(i=1;i<=n;i++)
        {
            tmp_sm = recursive_sum_of_digits(i);
            if(tmp_sm == sm)
              cnt++;
        }
        return cnt;
```

```
}
int recursive_sum_of_digits(int n)
{
      if(n == 0)
        return 0;
      return n % 10 + recursive_sum_of_digits(n/10);
}
int main()
{
      int n = 20, sum = 3;
      int ans = my_function(n,sum);
      printf("%d",ans);
      return 0;
}
```

a) 0
b) 1
c) 2
d) 3

42. Consider the following iterative implementation used to reverse a string:

```
#include<stdio.h>
#include<string.h>
void reverse_string(char *s)
{
     int len = strlen(s);
     int i,j;
     i=0;
     j=len-1;
     while(______)
     {
         char tmp = s[i];
         s[i] = s[j];
         s[j] = tmp;
```

```
            i++;
            j--;
        }
}
```

Which of the following lines should be inserted to complete the above code?
a) i > j
b) i < len
c) j > 0
d) i < j

Ans d

43. is the output of the following code?

```
#include<stdio.h>
#include<string.h>
void reverse_string(char *s)
{
     int len = strlen(s);
     int i,j;
     i=0;
     j=len-1;
     while(i < j)
     {
          char tmp = s[i];
          s[i] = s[j];
          s[j] = tmp;
          i++;
          j--;
     }
}
int main()
{
      char s[100] = "reverse";
```

```
      reverse_string(s);
      printf("%s",s);
      return 0;
}
```

a) ersevre
b) esrever
c) eserver
d) eresevr

Ans b

44.What does the following code do?

```
#include<stdio.h>
#include<string.h>
void reverse_string(char *s)
{
     int len = strlen(s);
     int i,j;
     i=0;
     j=len-1;
     while(i < j)
     {
         char tmp = s[i];
         s[i] = s[j];
         s[j] = tmp;
         i++;
         j--;
     }
}
int main()
{
      char s[100] = "abcdefg";
      char t[100];
      strcpy(t,s);
      reverse_string(s);
```

```
      if(strcmp(t,s) == 0)
        printf("Yes");
      else
        printf("No");
      return 0;
}
```

a) Copies a string to another string
b) Compares two strings
c) Reverses a string
d) Checks if a string is a palindrome

Ans. D

45. Consider the following iterative code used to convert a decimal number to its equivalent binary:

```
#include<stdio.h>
void dec_to_bin(int n)
{
      int arr[31],len = 0,i;
      if(n == 0)
      {
          arr[0] = 0;
          len = 1;
      }
      while(n != 0)
      {
          arr[len++] = n % 2;
          _______;
      }
      for(i=len-1; i>=0; i--)
        printf("%d",arr[i]);
}
int main()
```

```
{
      int n = 10;
      dec_to_bin(n);
      return 0;
}
```

Which of the following lines should be inserted to complete the above code?
a) n–
b) n /= 2
c) n /= 10
d) n++

Ans. B

46. What is the output of the following code?

```
#include<stdio.h>
int arr[31], len = 0;
void recursive_dec_to_bin(int n)
{
      if(n == 0 && len == 0)
      {
          arr[len++] = 0;
          return;
      }
      if(n == 0)
         return;
      arr[len++] = n % 2;
      recursive_dec_to_bin(n/2);
}
int main()
{
     int n = -100,i;
     recursive_dec_to_bin(n);
     for(i=len-1; i>=0; i--)
```

```
      printf("%d",arr[i]);
      return 0;
}
```

a) -1100100
b) 1100100
c) 2's complement of 1100100
d) Garbage value

Ans. D

47. What is the output of the following code?

```
#include<stdio.h>
int get_len(char *s)
{
      int len = 0;
      while(s[len] != '\0')
        len++;
      return len;
}
int main()
{
      char *s = "";
      int len = get_len(s);
      printf("%d",len);
      return 0;
}
```

a) 0
b) 1
c) Runtime error
d) Garbage value

Ans. A

48. Which of the following correctly represents the function to insert elements at the bottom of stack?

a)

```
int BottomInsert(int x)
{
      if(s.size()!=0) s.push(x);
      else
      {
            int a = s.top();
            s.pop();
            BottomInsert(x);
            s.push(a);
      }
}
```

b)

```
int BottomInsert(int x)
{
      if(s.size()==0) s.push(x);
      else
      {
            int a = s.top();
            s.pop();
            s.push(a);
            BottomInsert(x);
      }
}
```

c)

```
int BottomInsert(int x)
{
      if(s.size()==0) s.push(x);
      else
      {
```

```
            int a = s.top();
            s.pop();
            BottomInsert(x);
            s.push(a);
      }
}
```

d)

```
int BottomInsert(int x)
{
      if(s.size()==0) s.push(x);
      else
      {
            s.pop();
            int a = s.top();
            BottomInsert(x);
            s.push(a);
      }
}
```

Ans. C

49. Consider the following code snippet to find the smallest element in an array:

```
int get_min_element(int *arr, int n)
{
      int i, min_element = arr[0];
      for(i = 1; i < n; i++)
        if(_______)
          min_element = arr[i];
      return min_element;
}
```

Which of the following lines should be inserted to complete the above code?

a) arr[i] > min_element

b) arr[i] < min_element
c) arr[i] == min_element
d) arr[i] != min_element

Ans. B

50.Consider the following code snippet to find the largest element in a linked list:

```
struct Node{
   int val;
   struct Node *next;
}*head;
int get_max()
{
      struct Node* temp = head->next;
        int max_num = temp->val;
        while(______)
        {
              if(temp->val > max_num)
                max_num = temp->val;
            temp = temp->next;
        }
        return max_num;
}
```

Which of the following lines should be inserted to complete the above code?

a) temp->next != 0
b) temp != 0
c) head->next != 0
d) head != 0

Ans. b