1. **What will be the output of the following program?**

```
#include <stdio.h>
void main()
{
char name[]="AEIOU";
int i=0;
while(name[i]!='\0'){
        printf("%c",name [i]);
        i++;
}
return 0;
}
```

A. AEIOU\0
B. AEIOu
C. AEIOU
D. AEIOU\n

2. **What will be the output of the following program?**

```
#include <stdio.h>
int main(){
        printf(3+,"Andy");
        return 0;
}
```

A. Andy
B. n
C. y
D. Compiler error
E. Runtime Error

3. **What will be the output of the following program?**

```
#include <stdio.h>
#define defMethod(i)(i*i)

void main(){
        int a,b=5;
        a=defMethod(b+5);
        printf("\n%d",a);
}
```

A. 100
B. 25
C. 35
D. 45

4. **What will be the output of the following program in C?**

```
#include <stdio.h>
void show();
int main(){
        show();
```

```
        show();
}
void show(){
        auto int=0;
        register int j=0;
        static int k;
        i++;
        j++;
        k++;
        printf("\n%d %d %d",i,j,k);
}
```

A. 1 1 1
   1 1 2
B. 1 1 1
   1 1 1
C. 1 1 2
   1 1 2
D. 1 2 2
   1 2 2

5. **What will be the output of the following program?**

```
#include <stdio.h>
void main()
{
int i=1, j=-1, k=-1, l=2, m;
m=i++ || l++;
printf("%d",m);
}
```

A. 0
B. 1
C. 2
D. -2

6. **What will be the output of the following program in C?**

```
#include <stdio.h>
void main()
{
        int x=3,y=5;
        if(x==3)
                printf("\n%d",x);
        else
        printf("\n%d",y);
}
```

A. Compile time error
B. Runtime Error
C. 3 5
D. 3.0

7. What will be the output of the following program?

```
int main(){
        int arr[10];
        printf("%d",*arr+1-*arr+3);
}
```

A. 8
B. 5
C. 4
D. 12

8. Which of the given values will be displayed when the code is executed?

```
#include <stdio.h>
void main(){
        char b[]="12345\0";
        int x=strlen(b);
        printf("here in 3 %d\n",++x);
}
```

A. here in 3 3
B. here in 3 6
C. here in 3 9
D. here in 3 5

9. What will be the output of the following program?

```
#include <stdio.h>
int main(){
        int k=0;
        while(+(+k--)!=0)
        k=k++;
        printf("%d",k);
}
```

A. 1
B. 0
C. -1
D. -2

10. Identify the error in the following C code.

```
#include <stdio.h>
void main(){
        char arr[10]="rectangle"; //Line3
        int i;
        for(i=0;i<=7;i++)
                printf("%d",arr[i]);
        arr++; //line7
}
```

A. No error
B. We cannot declare an array of character type (Line3)
C. arr cannot be incremented (Line7)
D. Improper array declaration (Line3)

11. What will be the output of the following program in C?

```
#include <stdio.h>
void main()
{
        int s[][2]={2,6}, {4,8} };
        printf("%d",s);
}
```

A. Display: 2
B. Displays address of array s
C. Garbage value
D. Compiler error

12. What will be the output of the following C++ code if the input string is "Akhil"?

```
#include <conio.h>
#include <string.h>
#include <iostream.h>
void main()
{
        clrscr();
        char str[5];
        cout<<"Enter the string : ";
        cin>>str;
        for(int i = strlen(str); i >= 0; i--)
                for(int j = 0; j < 2; j++)
                        cout<<str[--i];
        getch();
}
```

A. lhk
B. lhA
C. likA
D. None of the given options

13. What will be the output of the following C program?

```
#include <stdio.h>
void main(){
        int i;
        char a[5] = {97,99,101,103,105};
        for (i=0; i<5; i=i+2)
                printf("%c" , a[++i]);
        printf(", %d",i)
}
```

A. ci, 6
B. ag, 6
C. ag, 5
D. Infinite loop

14. Considering the following enum in C++ , what will be the value of Sunday?
enum days {Sunday,Monday=5,Tuesday=6, Wednesday=7}

A. 4
B. 0
C. Generate an error
D. No value until you assign it

15. Assuming x, y and z are floating point variables and they have been assigned the values x=8.8, y=3.5 and z= -5.2.
What will be the value of the arithmetic expression 2*x/(3*y) in C++ ?

A. 2
B. 1.6
C. 1.67619
D. 0.67619

16. What will be the output of the following program?

```
int a =5, b=6;
if ( (b = 1) ==a)  {
        cout << a;
}       else {
        cout << ++b;
}
```

A. 5
B. 1
C. 2
D. 7

17. A C++ program contains the following declaration, what would be the value of the expression abs(i-2*j)?

```
int i = 8, j = 5;
abs (I – 2*j);
```

A. 2
B. 6
C. -2
D. Compilation error

18. What will be the output of the following program in C++ ?

```
switch(10) {
        case 10:
                cout << “1” << endl;
                break;
        case 10:
                cout << “2” << endl;
}
```

A. 1
B. 1
   2

C. 2
D. Error: Duplicate case value

19. What will be the output of the following program in C++?

```
#include<iostream.h>
void main(void)
{
        int I = 3;
        int j = i<<2;
        int x = I * j;
        cout<<i<<" * "<<j<<" + "<<x;
}
```

A. 3 * 9 = 27
B. 3 * 12 = 36
C. Compiler Error
D. Run-time error
E. None of the above

20. What will be the value of I after the following code is run in C++?

```
#include<iostream.h>
using namespace std;
int main(){
        int i = 0;
        char a[2] = { char() };
        a[i++] = ++I;
        cout<<i;
        return 0;
}
```

A. 2
B. 1
C. 3
D. Undefined

21. Considering the following sorted array and the search key as 89, what will be the sequence of keys in the array that are compared with 89 while binary searching for 89?
20 30 38 47 48 49 51 67 73 75 78 84 89 92 98

A. 51 78 89
B. 67 84 89
C. 73 89
D. 67 84 92 89

22. What would be the level-order traversal of the BST formed by inserting the following keys in sequence?
41 53 18 72 63 38 71 79 47 54

A. 41 18 53 38 47 72 63 79 54 71
B. 41 18 53 38 47 63 54 72 71 79
C. 18 38 41 47 53 54 63 71 72 79
D. 79 72 71 63 54 53 47 41 38 18

23. Which of the following situation is defined as a new process entering the waiting state when a resource requested by the new process is being held by another waiting process?

A. Deadlock
B. Lock
C. Semaphore
D. None of these

24. What is the complexity for the following pseudo code:

```
q = new Queue();
q.enqueue(initial node);
while( q ≠ empty) do
{
x = q.dequeue();
if( x has not been visited )
{
visited[x] = true;
for( every edge (x, y) )
        if( y has not been visited)
                q.enqueue(y);
}
}
```

A. O(V+E)
B. O(V2)
C. O(E*V)
D. O(E)

25. What is the output of the following C code:

```
#include<stdio.h>
int *f();
int main()
{
 int *p = f();
 printf("%d\n", *p);
}
int *f()
{
 int j =10;
 return &j;
}
```

A. 10
B. Compiler fails
C. Run time error
D. 0

26. What is the output of the following C code:

```
#include<stdio.h>
int main()
{
 char a[2][6] = {“hello’, “hi”};
 printf(“%s”, *a+3);
 return 0;
}
```

A. lo
B. llo
C. hi
D. Compilation failure

27. Which of these declarations of the following C++ statement is correct:

int a = 12;

A. int *ptr = &(a+1);
B. int *ptr2 = &a
C. &a = 36;
D. All of these

28. In java, which of the following statements about servlets are true?

1. For every request made to a servlet, a new lightweight Java thread is created instead of a process.

2. If ‘N’ requests are made to a servlet class, then ‘N’ copies of the servlet are loaded into the memory.

3. Servlets remain in memory even after completing a response.

4. Servlets do not use operating system shells for executing a system call.

A. 1, 2 and 3
B. 1, 2 and 4
C. 1, 3 and 4
D. All of these

29. Which of the following prepares an executable program?

A. Macro processor
B. Linker
C. Loader
D. Compiler

30. In data structures, what is the time complexity of inserting a data element into a sorted linked list of size N?

A. O(log N)
B. O(N)
C. O(N2)
D. O(1)

31. A new process arrives in a system every 10 seconds and each such process requires 8 seconds of service time. For what fraction of time will the CPU be busy?

A. 0.8
B. 0.7

C. 0.6
D. 0.9

32. In an operating system, which of the following is not shared among the threads of a process?
A. Global variables
B. File handlers
C. Stack
D. Local variables

33. Which of the following gives a sorted list of elements on inorder traversal?
A. Binary tree
B. Binary search tree
C. Heap
D. None of these

34. In Java, which of the following statements describes how is an object serialized?
A. The class of the object is made to implement the interface Serializable.
B. The method 'serializeObject()' is invoked on the object.
C. The static method 'serialize(Object obj)' is invoked from the class 'Serializer'.
D. None of these

35. What is the output of the following Java code:

```
class HackerEarth
{
 public static void main(String [] args)
 {
        HackerEarth he = new HackerEarth();
        he.output();
 }
 void output()
 {
        long [] x = {7,8,9};
        long [] y =fix(x);
        System.out.print(x[0] + x[1] + x[2] + " ");
        System.out.println(y[0] + y[1] + y[2]);
 }
 long [] fix(long [] z)
 {
        z[1] = 4;
        return z;
 }
}
```

A. 15 20
B. 20 20
C. 7 8 9 7 4 9
D. 7 4 9 7 4 9

36. P, Q and R are pointer variables. The statement below is intended to swap the contents of the nodes pointed to by P and Q.

P = Q; R = Q; Q = R;

Which of the following is the correct way of doing the swap?

A. R=Q -> P=R -> Q=R
B. R=P -> P=P -> Q=Q
C. P=P -> P=Q -> R=Q
D. R=P -> P=Q -> Q=R
E. P=R -> R=Q -> Q=R

37. What is the output of the following C code:

```
#include<stdio.h>
void main()
{
 int i = 320;
 char *ptr = (char *)&i;
 printf("%d", *ptr);
}
```

A. 320
B. 1
C. 64
D. Compilation error

38. An operating system uses FIFO policy for page replacement. It has 4-page frames, with no pages loaded at the start. The system first accesses 100 distinct pages in a specific order and then access the same 100 pages in the reverse order. How many page faults will occur?

A. 199
B. 197
C. 200
D. 196

39. In a relational database, a _____ is an entity that is not identified uniquely by its attributes.

A. Weak entity
B. Strong entity
C. ID-dependent entity
D. ID-independent entity

40. Which of these options are the correct sequence to perform a postorder traversal:

1. Visit the root node
2. Traverse the right subtree
3. Traverse the left subtree

A. 3 > 2 > 1
B. 1 > 2 > 3
C. 1 > 3 > 2
D. 2 > 1 > 3

41. Which of the following is the output of the following Java program:

```
class HackerEarth{
 public static void main(String args[]) {
        try {
                System.out.print("Java");
        } finally {
                System.out.println('Programming Language");
        }
 }
}
```

A. The program will not compile because no exceptions are specified.
B. The program will not compile because no catch clauses are specified.
C. Java
D. Java Programming Languages

42. Which of the following statements about the FIFO algorithm is true?

A. It first executes the job that enters the queue last.
B. It first executes the job that enters the queue first.
C. It first executes the job that has been in the queue for the longest time.
D. It first executes the job which is least required by the processor.

43. A new process arrives in a system every 10 seconds and each such process requires of time will the CPU be busy?

A. 0.8
B. 0.7
C. 0.6
D. 0.9

44. Palindromic String Problem

You are given two strings S1 and S2. You need to convert the string S1 into a palindromic string such that it contains the string s=S2 as its substring by using minimum number of operations. You are allowed to use only one type of operation i.e., you can replace any character of the string S1 with any other character.

Input format:

- First line: TEST denoting the number of test cases
- For each test case,
  - First line: String S1
  - Second line: String S2

Note :

- Both the strings can contain lower and upper case letters only.
- The upper case letterand its corresponding lower case letter are not the same. For example, A and a are considered as distinct characters.

Output format:

- Print the minimum number of operations that are required in a single line. If that is not possible, print -1.

Constraints:

- 1 <= TEST <= 5
- 1 <= Length(S1, S2) <= 5000

Sample Input	**Sample Output**
2 archit ar aaaaa bbb	3 3

Explanation

In the first sample, we can get a string “arccra” or “arhhra” as aou final string which is both palindromic as well as contains “ar” as substring. We can see that our final string differs from original string i.e. “archit” in exaclty 3 places. So, minimum number of operations required is 3.

Note: Your code should be able to convert sample input into the sample output. However, this is not enough to pass the challenge, because the code will be run on multiple test cases. Therefore, your code must solve this problem statement.

Time Limit: 1.0 sec(s) for each input file

Memory Limit: 256 MB

Source Limit: 1024 KB

Marking Scheme: Marks are allowed if any testcase passes

45. Walls

Consider N walls, each of unit width, situated next to each other. You have to select any two walls i and j (1 <= i, j<= N) such that if you break all the walls except i and j and fill the spaces between them with water, then the amount of water stored is maximum. Write a program to find the maximum amount of water that can be accumulated between the walls.

Input format:

- First line: T (number of test cases)
- For each test case
  - First line: N
  - Second line: N space-separated integers (denoting the heights of the walls)

Output format:

- For each test case, print the maximum amount of water that can be stored between the walls.

Constraints:

- 1 <= T <= 100
- 1 <= N <= 10^4
- 1 <= Value <= 10^9

Sample Input	**Sample Output**
2 5 1 2 3 4 5 5 3 2 1 4 5	4 9

46. Frequency Count

Given a string, find the frequencies of each of the characters in it. The input string contains only lowercase letters. The output string should contain a letter followed by its frequency, in the alphaabetical order (from a to z).

Input format:

First line: the input string

Output format:

Return a string representing the frequency counts of the characters in the input string.

47. Assuming number of nodes>2 in a linked list, which of the following codes will delete two nodes from the linked list?

A. Next[x] = Next[Next[x]];
B. Next[Next[x]] = x;
C. Next[x] = Next[Next[Next[x]]];
D. x = Next[Next[x+1]];

48. Considering the following function, what would be the maximum depth of the call stack, at any given time, created by the call: f(5)?

```
int f(int n)
{
return ( n < 3) ? n-1 : f(n-1) + f(n-2);
}
```

A. 4
B. 3
C. 5
D. 1

49. Considering the following function, how many activation records, in total, are generated by the following function call: f(5)?

```
int f(int n)
{
return ( n < 3) ? n-1 : f(n-1) + f(n-2);
}
```

A. 8
B. 10
C. 7
D. 9

50. If the address of the first node of a linked list consisting of an integer and a pointer to next node is 1000, what will be the address of the second node of the same linked list?

A. 1004
B. 1008
C. 1006
D. 1002
E. None of the given options

51. You have implemented a queue using two stacks. The queue should support dequeue operation in O(1). How many push/pop operations are required to support the following sequence of queue operations?

```
Enqueue(5);
enqueue(6);
dequeue();
enqueue(3);
enqueue(4);
dequeue();
```

A. 12 push 10 pop
B. 8 push 10 pop
C. 17 push 10 pop
D. 6 push 4 pop

52. Considering the following function, if you perform a breadth first scan of its recursion tree for call f(5), what would be the maximum size of the queue, at any given time?

```
int f(int n)
{
return ( n < 3) ? n-1 : f(n-1) + f(n-2);
}
```

A. 4
B. 5
C. 3
D. 6