

10) The maximum allocated size of a queue in a computer program is 1Gb (1024 Mb). Functions A and B push data into the queue at 4Mb/s and 2Mb/s. Functions C and D pops data (takes data) from the queue at 3Mb/s and 1Mb/s respectively for processing. At the start of the program execution, functions A and B push data into the queue at the same time. When the queue is 720Mb full, function C is activated and pops data from the queue for processing and when the queue is 900Mb full, function D is activated. At what time will the queue overflow ?

11) A bottle contains a mixture of two liquids A and B is the ratio 7 : 5. When 9 liters of mixture is drawn off and the bottle is filled with B, the ratio of A and B becomes 7 : 9. How many liters of liquid B was initially contained in the bottle ?

12) On every Friday Amar, Akbar and Anthony lunch together at Punjabhi-Dhaba where they order lassi based on following facts. 1. Unless neither Amar nor Akbar have lassi, Anthony must have it. 2. If Amar does not have lassi, either Akbar or Anthony or both have it. 3. Anthony has lassi only if either Amar or Akbar or both have it. 4. Akbar and Anthony never have lassi together. Of the 3, who never orders lassi?

13) What is the angle between the hour and minute hand of the clock when the time is 6:48 ?

14) A motorboat, whose speed is 15 km/hr in still water, goes 30 km downstream and comes back in a total of 4 hours 30 minutes. What is the speed of the stream (in km/hr) ?

15) Alex gets on the elevator at the 3rd floor of a building and rides up at the rate of 16 floors per minute. At the same time, Bob gets on an elevator at the 60th floor of the same building and rides down at the rate of 22 floors per minute. If they continue travelling at these rates, then at which floor will their paths cross ?

- All questions carry equal marks. No negative marks.
- Please do not write or mark anything on the question paper.
- All the programs compiles and runs successfully.

1) What will be the output of the following program?

```
#include<stdio.h>
int i = 0;
int fun(int n){
    i++;
    if(n > 90)
        return n - 20;
    return fun(fun(n + 21));
}
void main() {
    printf("%d\n", fun(87));
    printf("%d\n", i);
}
```

2) What will be the output of the following program?

```
#include<stdio.h>
int main()
{
    int i = 4, j = 8;
    i = i | j | i + i | j | i - i ^ j;
    j = i | i & j | j + j | j | i | i - j ^ j;
    printf("%d, %d, %d\n", i | j | i, i | j | i, i ^ j);
    return 0;
}
```

3) What will be the output of the following program?

```
#include<stdio.h>

int main(){
    char* str = "Hello World";
    int i;
    int len = strlen(str);
    for(i = 0 ; i <= len ; i++)
    {
        printf("%c",str[len-i]);
    }
    return 0;
}
```

4) What will be the output of the following program?

```
#include <stdio.h>

struct module1
{
    unsigned int x: 5;
    unsigned int y: 8;
}m1;

struct module2
{
    unsigned int x: 5;
    unsigned int y: 0;
    unsigned int z: 8;
}m2;

int main()
{
    printf("%d %d\n", m1.x++ + m2.x, m1.y+m2.y++);
    return 0;
}
```

5) What will be the output of the following program?

```
# include <stdio.h>
int main() {
    int i=0;
    for(i=0; i<20; i++) {
        switch(i) {
            case 0:
                i+=5;
            case 1:
                i+=2;
            case 5:
                i+=5;
            default:
                i+=4;
                break;
        }
        printf("%d ", i);
    }
    return 0;
}
```

6) What will be the output of the following program?

```
#include <stdio.h>
#define square(x) x*x
int main()
{
    int i;
    i = 64/square(4);
    printf("%d",i);
}
```

P7) What is the output of this program on an implementation where int occupies 2 bytes?

```
#include <stdio.h>
int main(void)
{
    int i = 5;
    int j;
    j = sizeof(i) + i + sizeof(i);
    printf("%d\n%d\n%d\n", i, j);
    return 0;
}
```

Q8) What will be the output of the following program?

```
#include <stdio.h>

int main()
{
    char s[ ]="zohoz";
    int i;
    for(i=0;s[i];i++)
        printf("%c%c%c%c%c",s[i],*(s+i),*(i+s),s[i]);
    printf("\n");
}
```

P7) What will be the output of the program?

```
class ByteClass
{
    byte x;
}
class MainClass
{
    public static void main(String [] args)
    {
        MainClass p = new MainClass();
        p.start();
    }
    void start()
    {
        ByteClass bc = new ByteClass();
        System.out.print(bc.x + " ");
        ByteClass bctest = fx(bc);
        System.out.println(bc.x + " " + bctest.x);
    }
    ByteClass fx(ByteClass b)
    {
        b.x = 42;
        return b;
    }
}
```

P8) Output of the following code

```
public static void main(String[] args)
{
    String input = "zohocorp";
```

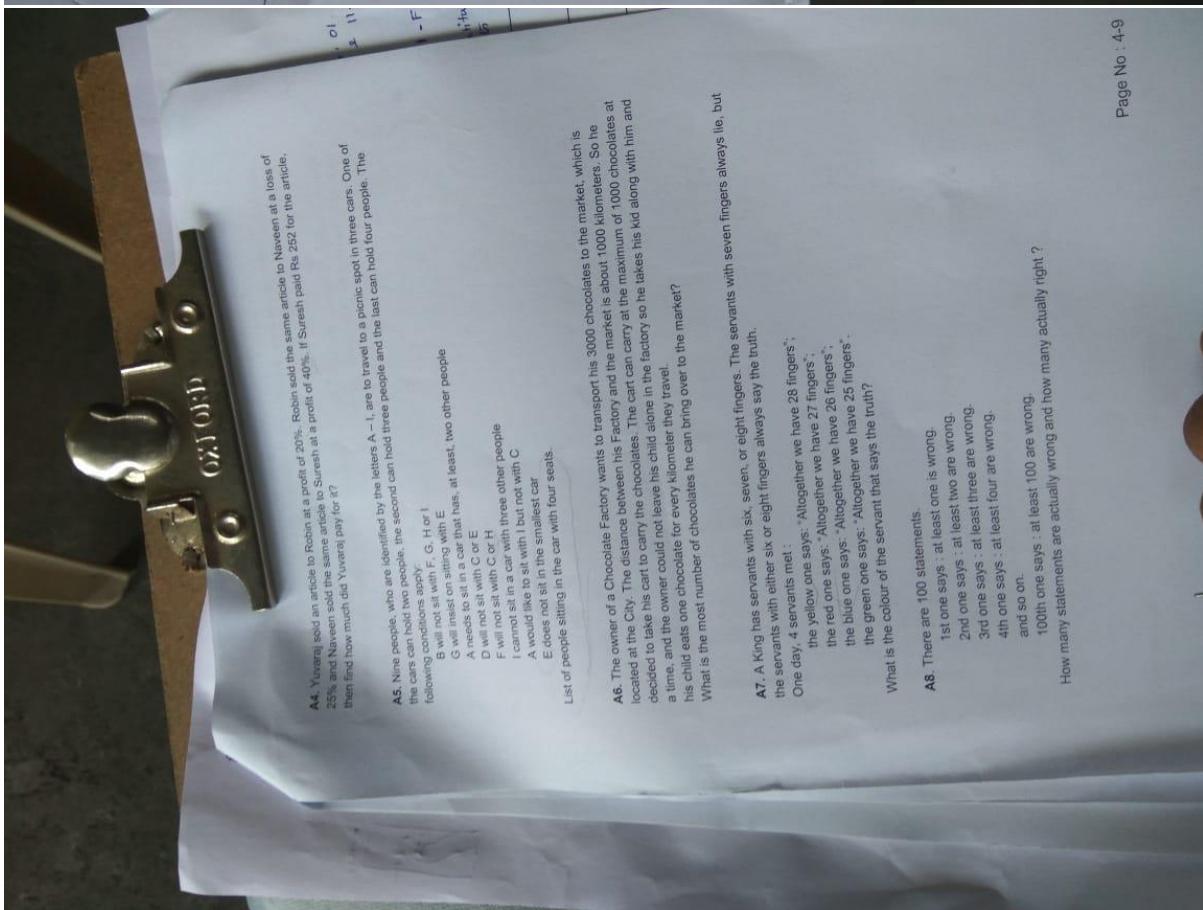
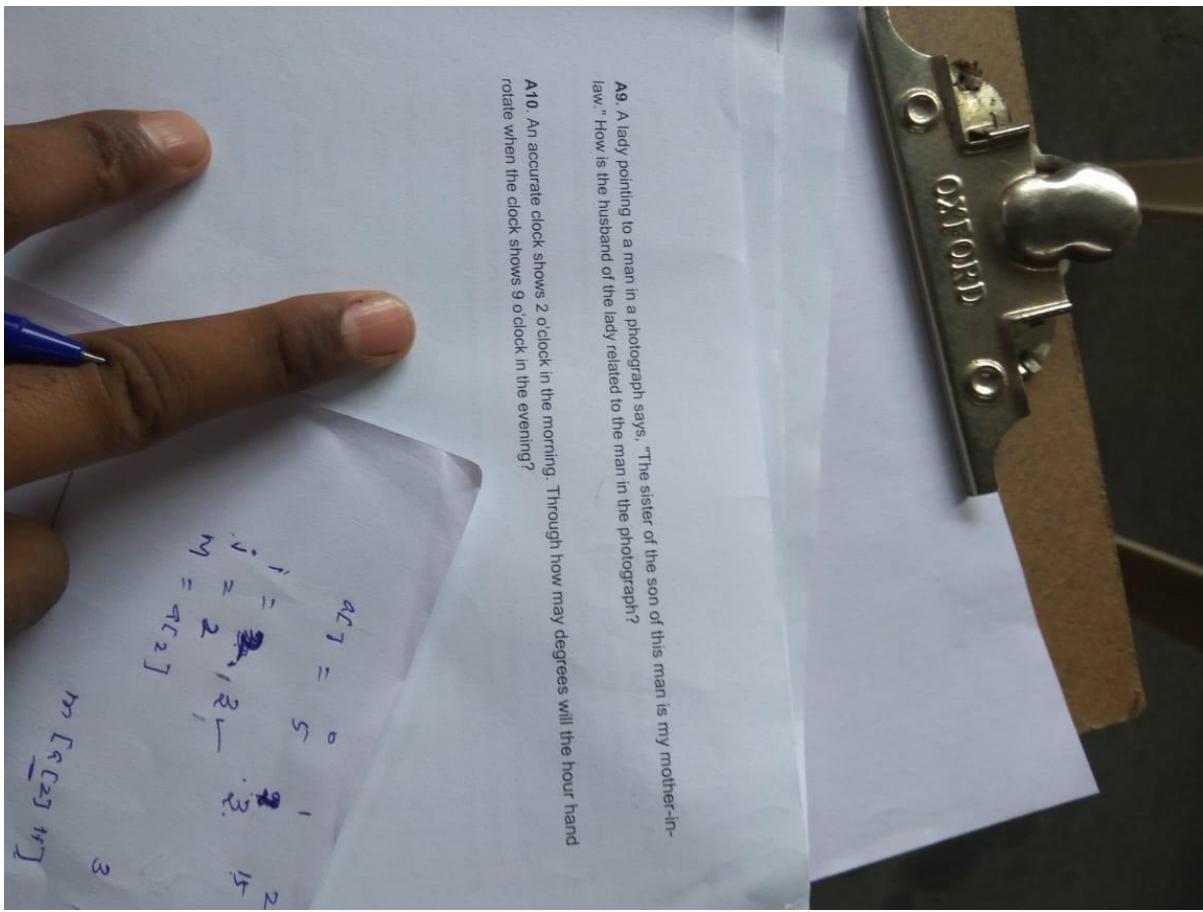
9) What will be the output of the following program?

```
#include<stdio.h>
int main() {
    void fun(char* );
    char a[100];
    a[0] = 'Z'; a[1] = 'O';
    a[2] = 'H'; a[3] = 'O';
    fun(&a[0]);
    return 0;
}
void fun(char *a) {
    a++;
    printf("%c", *a);
    a++;
    printf("%c", *a);
}
```

10) What will be the output of the following program?

```
#include<stdio.h>
#include<string.h>
int main()
{
    char str1[] = "zohocorp.com";
    char str2[20] = "";
    strncpy(str2, str1, 8);
    printf("%s", str2);
    return 0;
}
```

- 1) A tank can be filled by pipe A in 30 minutes & by pipe B in 24 minutes. Outlet pipe C can empty the full tank in 1 hour & 20 minutes. If the tank is empty initially and if all the 3 pipes A,B & C are opened simultaneously, In how much time will the tank be full?
- 2) A red light flashes 3 times per minute and a green light flashes 5 times in two minutes at regular intervals. If both lights start flashing at the same time, how many times do they flash together in each hour?
- 3) At a party, everyone shook hands with everybody else. There were 120 handshakes. How many people were at the party?
- 4) One-year payment to the servant is Rs. 200 plus one shirt. The servant leaves after 9 months and receives Rs. 120 and a shirt. Then find the price of the shirt.
- 5) The maximum allocated size of a queue in a computer program is 1Gb (1024 Mb). Functions A and B push data into the queue at 4Mb/s and 2Mb/s. Functions C and D pops data (takes data) from the queue at 3Mb/s and 1Mb/s respectively for processing. At the start of the program execution, functions A and B push data into the queue at the same time. When the queue is 720Mb full, function C is activated and pops data from the queue for processing and when the queue is 900Mb full, function D is activated. At what time will the queue overflow ?
- 6) What is the angle between the hour and minute hand of the clock when the time is 6:48 ?
- 7) On every Friday Amar, Akbar and Anthony lunch together at Punjabhi-Dhaba where they order lassi based on following facts. 1. Unless neither Amar nor Akbar have lassi, Anthony must have it. 2. If Amar does not have lassi, either Akbar or Anthony or both have it. 3. Anthony has lassi only if either Amar or Akbar or both have it. 4. Akbar and Anthony never have lassi together. Of the 3, who never orders lassi?
- 8) A bottle contains a mixture of two liquids A and B is the ratio 7 : 5. When 9 liters of mixture is drawn off and the bottle is filled with B, the ratio of A and B becomes 7 : 9. How many liters of liquid B was initially contained in the bottle ?



A4. Yuvardhi sold an article to Robin at a profit of 20%. Robin sold the same article to Naveen at a loss of 25% and Naveen sold the same article to Suresh at a profit of 40%. If Suresh paid Rs 252 for the article, then find how much did Yuvardhi pay for it?

- A5. Nine people, who are identified by the letters A - I, are to travel to a picnic spot in three cars. One of the cars can hold two people, the second can hold three people and the last can hold four people. The following conditions apply:  
B will not sit with F, G, H or I  
G will insist on sitting with E  
A needs to sit in a car that has, at least, two other people  
D will not sit with C or H  
F will not sit with C or I  
I cannot sit in a car with three other people  
A would like to sit with I but not with C  
E does not sit in the smallest car

List of people sitting in the car with four seats.  
What is the most number of chocolates he can bring over to the market?

A6. The owner of a Chocolate Factory wants to transport his 3000 chocolates to the market, which is located at the City. The distance between his factory and the market is about 1000 kilometers. So he decided to take his cart to carry the chocolates. The cart can carry at the maximum of 1000 chocolates at a time, and the owner could not leave his child alone in the factory so he takes his kid along with him and his child eats one chocolate for every kilometer they travel.

What is the most number of chocolates he can bring over to the market?

A7. A King has servants with six, seven, or eight fingers. The servants with seven fingers always lie, but the servants with either six or eight fingers always say the truth.

One day, 7 servants met:  
the yellow one says: "Altogether we have 28 fingers";  
the red one says: "Altogether we have 27 fingers";  
the red one says: "Altogether we have 26 fingers";  
the blue one says: "Altogether we have 25 fingers".

What is the colour of the servant that says the truth?

A8. There are 100 statements.

- 1st one says : at least one is wrong.  
2nd one says : at least two are wrong.  
3rd one says : at least three are wrong.  
4th one says : at least four are wrong.  
and so on.

How many statements are actually wrong and how many actually right?

```
char[] temparray = input.toCharArray();
int a, b>0;
b = temparray.length-1;

for (a=0; a < b ; a++,b--)
{
    char temp = temparray[a];
    temparray[a] = temparray[b];
    temparray[b]=temp;
}
for (char c : temparray)
    System.out.print(c);
System.out.println();
}
```

P9. What will be the output of the program?

```
int main()
{
    int x=1, y=1;
    for(; y; printf("%d %d\n", x, y))
    {
        y = x++ <= 5;
    }
    printf("\n");
    return 0;
}
```

P10. Which of the following operations is not O(1) for an array of sorted data. You may assume that array elements are distinct.

- (a) Find the  $i$ th largest element
- (b) Delete an element
- (c) Find the  $i$ th smallest element
- (d) All of the above

P11. Predict the output of the following code

```
public class testString{
    String result = "";
    public String findString(String str){
        if(str.length() == 1){
            return str;
        } else {
            result += str.charAt(str.length()-1)+findString(str.substring(0,str.length()-1));
            return result;
        }
    }
}
```

**A4.** Yuvraj sold an article to Robin at a profit of 20%. Robin sold the same article to Harish at a loss of 25% and Naveen sold the same article to Surendra at a profit of 40%. If Surendra paid Rs. 25/- for the article, then how much did Yuvraj pay for it?

**A5.** Nine people who are identified by the letters A – I are to travel to a picnic spot in three cars. One of the cars can hold two people, the second can hold three people and the last can hold four people. The following conditions apply:

- (a) If a is true and b is false then the output is "ELSE".
- (b) If a is false and b is true then the output is "BY".
- (c) If a is false and b is false then the output is "OR".
- (d) If a is false and b is true then the output is "NOT".
- (e) If a is true and b is false then the output is "TRUE".
- (f) If a is true and b is true then the output is "AND".
- (g) If a is false and b is not with C or H
- (h) G will sit on sailing with E
- (i) A needs to sit in a car that has, at least, two other people
- (j) D will not sit with C or H
- (k) F will not sit with C or H
- (l) I cannot sit in a car with three other people
- (m) A would like to sit with I but not with C
- (n) E does not sit in the smallest car

List of people sitting in the car with four seats.

**A6.** The owner of a Chocolate Factory wants to transport his 3000 chocolates to the market, which is located at the City. The distance between his Factory and the market is about 1000 Kilometers. So he decided to take his car to carry the chocolates. The car can carry at the maximum of 1000 chocolates at a time, and the owner could not leave his child alone in the factory so he takes his kid along with him and his child eats one chocolate for every kilometer they travel.

What is the most number of chocolates he can bring over to the market?

**A7.** A King has servants with six, seven, or eight fingers. The servants with seven fingers always lie, but the servants with either six or eight fingers always say the truth.

One day, 4 servants met:

- the yellow one says: "Altogether we have 28 fingers";
- the red one says: "Altogether we have 27 fingers";
- the blue one says: "Altogether we have 26 fingers";
- the green one says: "Altogether we have 25 fingers".

What is the colour of the servant that says the truth?

**A8.** There are 100 statements.

- 1st one says: at least one is wrong.
- 2nd one says: at least two are wrong.
- 3rd one says: at least three are wrong.
- 4th one says: at least four are wrong.
- and so on.

100th one says : at least 100 are wrong.

How many statements are actually wrong and how many actually right ?

**P16.** Following is an incorrect pseudocode for the algorithm which is supposed to determine whether a sequence of parentheses is balanced:

```

    if ( s[i] is available )
        if ( the character is a '(' )
            push it on the stack
        else
            pop a character off the stack
    else
        print "unbalanced" and exit the program
}
print "balanced"
}

```

Find the unbalanced sequences in the below option, which the code thinks as balanced?

(a) ()()

(b) ((())

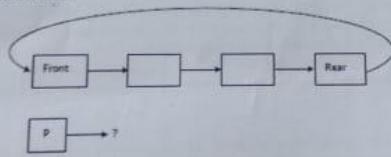
(c) (((()

(d) ((()) (2)

**P17.** What will be the output of the program?

```
public class Test
{
    public static void main(String args[])
    {
        int i = 1, j = 0;
        switch(i)
        {
            case 2: j += 6;
            case 4: j += 1;
            default: j += 2;
            case 0: j += 4;
        }
        System.out.println(" = " + j);
    }
}
```

**P18.** A circularly linked list is used to represent a Queue. A single variable p is used to access the Queue. To which node should p point such that both the operations enQueue and deQueue can be performed in constant time?



- (a) rear node
- (b) front node
- (c) not possible with a single pointer
- (d) node next to front

**P19.** Predict the output of the following code:

```
#include <stdio.h>
int main()
{
    int a = 10, b = 20, c = 30;
    if (c > b > a)
    {
        printf("TRUE");
    }
    else
    {
        printf("FALSE");
    }
}
```

P3. Output of the following code

```
int process(int n)
{
    return n == 0 ? 0 : 1;
}
int main(void)
{
    printf("%d", process(135));
    getchar();
    return 0;
}
```

P4. Output of the following code

```
public static void main(String args[])
{
    for (int i = 0; i < 10; i++)
    {
        if (i%2 == 0)
            continue;
        System.out.print(i + " ");
    }
}
```

P5. Consider the following code

```
class Test
{
    public Test x;
    public static void main(String [] args)
    {
        Test x2 = new Test(); /* Line 6 */
        Test x3 = new Test(); /* Line 7 */
        x2.x = x3;
        x3.x = x2;
        x2 = new Test();
        x3 = x2; /* Line 11 */
        ...
        ...
    }
}
```

After line number 11 runs, how many objects are eligible for garbage collection?

P6. What will be the output of the program?

```
class Test
{
```

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```
}
```

```
    public static void main(String args){}
```

```
        TestString ts = new TestString();
```

```
        System.out.println("Result: "+ts.getString("JavaString"));
```

```
}
```

P12. The initial configuration of the queue is a,b,c,d (a is the front end). To get the configuration d,c,b,a one needs a minimum of ?

- (a) 2 deletions and 3 additions
- (b) 3 additions and 2 deletions
- (c) 3 deletions and 3 additions
- (d) 4 deletions and 4 additions

P13. Which of the following statements are correct about the below C-program?

```
int main()
{
    int x=10, y=100 % 90, i;
    for( i = 1; i < 10; i++)
    {
        if( x != y)
            printf("%d %d\n", x, y);
    }
    return 0;
}
```

2.6 - Q1 2.0  
2 11. 3.0

L1 - F Q3  
Time limit: 9 s  
Memory limit: 512 MB

P14. Output of the following code:

```
class Test1 {
    Test1(int x){
        System.out.println("Constructor value : " + x);
    }
}
class Test2 {
    Test2(){
        Test1 t1 = new Test1(10);
        Test2(t1);
    }
    public static void main(String args){
        Test2 t2 = new Test2(5);
    }
}
```

P15. From the following code,

OXFORD

```
char[] temparray = input.toCharArray();
int a, b=0;
b = temparray.length-1;

for (a=0; a < b ; a++, b--)
{
    char temp = temparray[a];
    temparray[a] = temparray[b];
    temparray[b]=temp;
}
for (char c : temparray)
    System.out.print(c);
    System.out.println();
}
```

P9. What will be the output of the program?

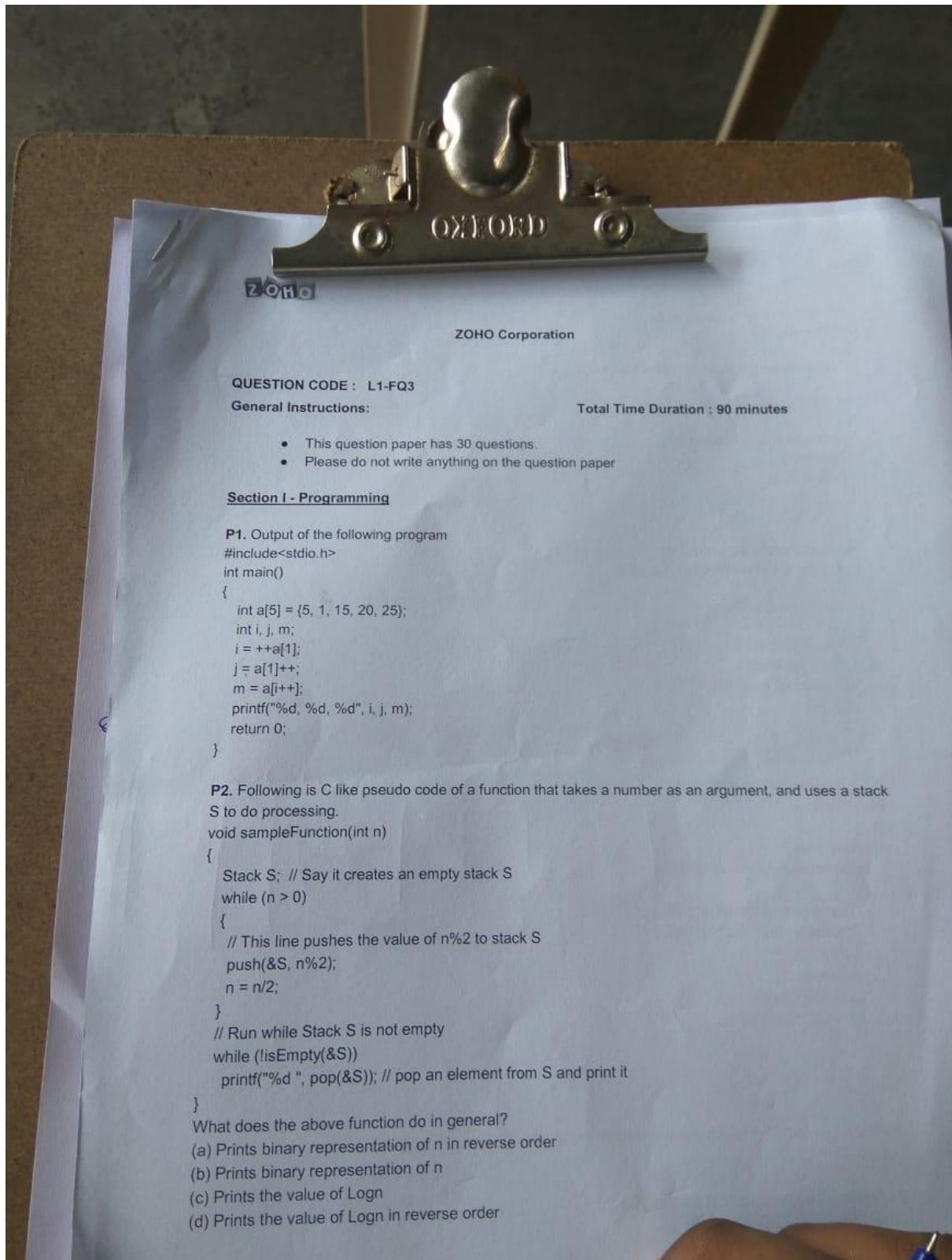
```
int main()
{
    int x=1, y=1;
    for(; y; printf("%d %d\n", x, y))
    {
        y = x++ <= 5;
    }
    printf("\n");
    return 0;
}
```

P10. Which of the following operations is not O(1) for an array of sorted data. You may assume that array elements are distinct.

- (a) Find the i<sup>th</sup> largest element
- (b) Delete an element
- (c) Find the i<sup>th</sup> smallest element
- (d) All of the above

P11. Predict the output of the following code

```
public class testString{
    String result = "";
    public String findString(String str){
        if(str.length() == 1){
            return str;
        } else {
            result +=str.charAt(str.length()-1)+findString(str.substring(0,str.length()-1));
        }
        return result;
    }
}
```





P3. Output of the following code

```
int process(int n)
{
    return n == 0 ? 0 : n%10 + process(n/10);
}
int main(void)
{
    printf("%d", process(1352));
    getchar();
    return 0;
}
```

P4. Output of the following code

```
public static void main(String args[])
{
    for (int i = 0; i < 10; i++)
    {
        if (i%2 == 0)
            continue;
        System.out.print(i + " ");
    }
}
```

P5. Consider the following code

```
class Test
{
    public Test x;
    public static void main(String [] args)
    {
        Test x2 = new Test(); /* Line 6 */
        Test x3 = new Test(); /* Line 7 */
        x2.x = x3;
        x3.x = x2;
        x2 = new Test();
        x3 = x2; /* Line 11 */
        ...
        ...
    }
}
```

After line number 11 runs, how many objects are eligible for garbage collection?

P6. What will be the output of the program?

```
class Test
{
```



OXFORD

```
char[] temparray = input.toCharArray();
int a, b=0;
b = temparray.length-1;

for (a=0; a < b ; a++,b--)
{
    char temp = temparray[a];
    temparray[a] = temparray[b];
    temparray[b]=temp;
}
for (char c : temparray)
    System.out.print(c);
    System.out.println();
}
```

P9. What will be the output of the program?

```
int main()
{
    int x=1, y=1;
    for( y; printf("%d %d\n", x, y))
    {
        y = x++ <= 5;
    }
    printf("\n");
    return 0;
}
```

P10. Which of the following operations is not O(1) for an array of sorted data. You may assume that array elements are distinct.

- (a) Find the i<sup>th</sup> largest element
- (b) Delete an element
- (c) Find the i<sup>th</sup> smallest element
- (d) All of the above

P11. Predict the output of the following code

```
public class testString{
    String result = "";
    public String findString(String str){
        if(str.length() == 1){
            return str;
        } else {
            result += str.charAt(str.length()-1)+findString(str.substring(0,str.length()-1));
        }
        return result;
    }
}
```

```
#include <stdio.h>

int fun(int n){
    if(n!=0) {
        return n - fun(n-5);
    } else {
        return n;
    }
}

int main(){
    int n = 10, z;
    z = fun(n);
    printf("%d", z);
}
```

9. What will be the output of the following program? (1 mark)

```
#include<stdio.h>
int min(int x, int y){
    return (y < x)? y : x;
}
int main(){
    int a[] = {-5, 9, 8, -8, -2};
    int z = a[0], n=5, i=0,c=a[0];
    for (i = 1; i < n; i++) {
        c = min(a[i], c+a[i]);
        z = min(z, c);
    }
    printf("%d", z);
}
```

10. What will be the output of the following program? (1 mark)

```
#include<stdio.h>
int main() {
    int c[]={5,0,3,4,5};
    int j,*q=c;
    for(j=0;j<*q;j++){
        printf("%d ",*c);
        ++q;
    }
}
```

11. What will be the output of the following program? (2 marks)

```
#include<stdio.h>
int main(){
    int arr[] = {1, 4, 7, 3, 4, 1};
    int i,j, k=1,s=6, m=0;
    for(i=1;i<s;i++)
    {
        for(j=i+1;j<=s;j++)
        {
            if(arr[i] > arr[j])
                m++;
        }
    }
    printf("m=%d", m);
}
```

```
for(i=0;i < k;i++) {  
    m+=arr[i];  
}
```

j      printf("%d",m);

12. What will be the output of the following program? (2 mark)

```
#include <stdio.h>  
int m = 0;  
int find(int j) {  
    if(j>1){  
        j=find(j/10)-(j%10);  
    }else {  
        m+=j;  
    }  
}
```

j=0;

return j;

```
int main()
```

int i=8090;

int k;

k=find(i);

printf("%d", m);

Consider the following recursive C function. Find the number of times the following program for the given input "mysql" (2 marks)

```
<stdio.h>  
char *s) {  
s[0] == '\0') {  
    return;
```

1).

4. What will be the output of the following program? (1 mark)

```
    printf("%c%6s", c, p++);  
}
```

```
#include <stdio.h>  
void main()  
{  
    int n = 11, res=1;  
    do  
    {  
        n -= 5;  
        res *= 5;  
    }while (n > 5);  
    printf("%d", n*res);  
}
```

5. What is the output of the method for the following program ?

```
#include <stdio.h>  
#include <int>  
void function(int a[3][3]);  
int main(void)  
{  
    int a[3][3] = {1,2,3,4,5,6,7,8,9};  
    function(a);  
    printf("%d", a[2][1] - a[1][2]);  
    return 0;  
}  
void function(int a[3][3])  
{  
    ++a;  
    a[1][1]++;  
}
```

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

```
#include <stdio.h>  
int main()  
{  
    int i=4;  
    i++ ) {  
    ..
```

```
int main()
    int n = 10, z;
    z = fun(n);
    printf("%d", z);
}
```

9. What will be the output of the following pr

```
#include<stdio.h>
int min(int x, int y){
    return (y < x)? y : x;
}
int main(){
    int a[] = {-5, 9, 8, -8, -2};
    int z = a[0], n=5, i=0,c=a[0];
    for (i = 1; i < n; i++) {
        c = min(a[i], c+a[i]);
        z = min(z, c);
    }
    printf("%d", z);
}
```

10. What will be the output of the fo

```
#include<stdio.h>
int main() {
    int c[]={5,0,3,4,5};
    int j,*q=c;
    for(j=0;j<*q;j++){
        printf("%d ",*q);
        ++q;
    }
}
```

```
        return 0;  
    }
```

8. What will be the output of the following program? (1 mark)

```
#include <stdio.h>  
  
int fun(int n){  
    if(n!=0) {  
        return n - fun(n-5);  
    } else {  
        return n;  
    }  
}  
  
int main(){  
    int n = 10, z;  
    z = fun(n);  
    printf("%d", z);  
}
```

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

```
#include<stdio.h>  
int min(int x, int y){  
    return (y < x)? y : x;  
}  
int main(){  
    int a[] = {-5, 9, 8, -8, -2};  
    int z = a[0], n=5, i=0,c=a[0];  
    for (i = 1; i < n; i++) {  
        c = min(a[i], c+a[i]);  
        z = min(z, c);  
    }  
    printf("%d", z);  
}
```

10. What will be the output of the follow

```
#include<stdio.h>
```

e the output  
<stdio.h>

```
int i=4;  
for (i=0;i<-4;i++) {  
    printf("%d", i);  
    if (i!= -3) break;  
}  
return 0;  
}
```

7. What will be the output of the following program

```
#include <stdio.h>  
int main(void)  
{  
    int a=100, b=200;  
    a+=b>=300?b=100:a==100;  
    printf("%d", a+b);
```

```
j      i=0  
j      cout<<j;  
in main()  
j
```

for i=0;i<n;

int k;

k=find(i);

```
cout<<"ed", m);  
j
```

13. Consider the following recursive C function. Find following program for the given input "mysql" (2 mark)

```
#include <stdio.h>  
void abc(char *s) {  
    if(s[0] == '\0')  
        return;  
    abc(s+1);  
    abc(s+1);  
    printf("%c", s[0]);  
}  
in main() {  
    abc("mysql");  
    return 0;  
}
```

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

```
#include <stdio.h>  
in main()
```

```
int b = 2;  
b =
```

1. Excluding stops per hour, how many minutes does the bus stop per hour?

2. Solve this logic number sequence puzzle by the correct digit

$$8080 = 6$$

$$1357 = 0$$

$$2022 = 1$$

$$1999 = 3$$

$$6666 = ?$$

3. John borrowed some money at the rate of 7% per annum for the first 3 yr, at the rate of 10% per annum for the next 5 yr and at the rate of 12% per annum for the period beyond 8 yr. If he pays a sum of Rs. 5100 at the end of 11 yr, how much money did he borrow?

4. Dexter was born between October 6th and 10th (6th and 10th excluding). His year of birth is not known. What is the probability of Dexter being born on a Saturday?

5. 4, 7, 15, 29, 59, 117, \_\_\_\_\_

6. A clock gains 10 minutes in every 24 hours. It is set right on Monday at 8 a.m. What will be the time on the following Wednesday, when the watch indicates 6 p.m.?

7. Slowcoach Express runs between Amritsar and Bombay. For the up as well as the down train leaves the starting station at 0900 hours everyday and reaches its destination after three days. Mr Swift once travelled by Slowcoach Express from Bombay to Amritsar. On his return journey by the same name did he cross enroute?

8. The present ages of three persons are in proportions 4 : 5 : 7. Eight years ago, the sum of their ages was 44. Find the present age of the youngest person (in years).

9. A alone can do a piece of work in 6 days and B alone in 8 days. A and B undertook to do it for Rs. 3200. With the help of C, they completed the work in 3 days. How much is to be paid to each?

10. A and B started a partnership business investing some amount in the ratio of 3 : 5 for six months with an amount equal to that of B. In what proportion should the profit be distributed among A, B and C?

}

4. What will be the output of the following program? (1 mark)

```
#include <stdio.h>
void main() {
    int n = 11,res=1;
    do
    {
        n -= 5;
        res *= 5;
    }while (n > 5);
    printf("%d",n*res);
}
```

5. What is the output of the method for the following program ?

```
#include <stdio.h>

void function(int a[][3]);
int main(void)
{
    int a[3][3] = {1,2,3,4,5,6,7,8,9};
    function(a);
    printf("%d",a[2][1] - a[1][2] );
    return 0;
}
void function(int a[][3])
{
    ++a;
    a[1][1]++;
}
```

6. What will be the output of the following program? (1 mark)

```
#include <stdio.h>
int main()
{
    int i=4;
    for (i=0;i=-4;i++) {
        printf( "%d" ,i);
        if (i!= -3)
            break ;
    }
    return 0;
}
```

7. What will be the output of the following program? (1 mark)

```
#include <stdio.h>
int main(void)
{
    int a=100, b=200;
    a+=b>=300?b=100:a==100;
    printf("%d",a+b);
```

```
#include<stdio.h>
int i = 0;
int fun(int n){
    i++;
    if(n > 90)
        return n - 20;
    return fun(fun(n + 21));
}
void main() {
    printf("%d\n", fun(87));
    printf("%d\n", i);
}
```

4) What will be the output of the following program?

```
#include<stdio.h>
int main()
{
    int i=4, j=8;
    i = i|j&j|i + i|j&j|i - i^j;
    j = i|i&j|j + j|j&i|i - j^j;
    printf("%d, %d, %d\n", i|j&j|i, i|j&j|i, i^j);
    return 0;
}
```

What is the output of the following program?

```
#include <stdio.h>
#include <string.h>
void concat(char *p,char *q);
int main() {
    char *x = "ZohoCorp";
    char *y = "ManageEngine";
    concat(x,y);
    return 0;
}
void concat(char *p,char *q) {
    int i,j,k=0,temp=0;
    char c[50];
    for(j=0; j<strlen(p); j++) {
        c[k++]=p[j];
        temp++;
        for(i=j+1; q[i]!='\0',i<=j+temp; i++) {
            c[k++]=q[i];
        }
        j=k-1;
    }
    c[k]='\0';
    printf("%s",c);
}
```

```

#include<string.h>
int main()
{
    int nf,i,j,c,m;
    char str[]={"Zoho Corporation - Chennai"};
    int length = strlen(str);
    i=0,m=0,c=0;

    while(str[i]!='\0' && i <= length)
    {
        j=i;
        c=0;
        while((str[j]!=' ')&&(str[j]!='\0')){
            j++;
        }
        i=j+1;
        while(~j && str[j] != ' ')
        {
            if ( str[j] == 'o'){
                c++;
            }
        }
        if ( m < c ) m = c;
    }
    printf("%d \n", m);
}

```

14. What will be the output of the following program? (2 marks)

```

#include<stdio.h>
void main()
{
    int arr[] = {-3,1,2,3,2,-3,2};
    int i,j, k=1,s=6;
    for(i=1;i<s;i++)
    {
        for(j=0;j<k;j++)
        {
            if(arr[i] == arr[j])
                break;
        }
        if(j==k)
            arr[k++] = arr[i];
    }
    for(i=0;i < k;i++)
        printf("%d ",arr[i]);
}

```

12) What will be the output of the following program?

```
#include<stdio.h>
#include<string.h>
int m = 0;
void main() {
    char str[10] = "Zoho";
    int len=0, i=0;
    len = strlen(str);
    calculate(str, 0, len-1);
    printf("%d\n", m);
}
void swap (char *x, char *y) {
    char temp;
    temp = *x;
    *x = *y;
    *y = temp;
}
void calculate(char *a, int i, int n) {
    int j=0;
    if(i == n) {
        m++;
    }
    else {
        for(j = i; j <= n; j++) {
            swap((a+i), (a+j));
            calculate(a, i+1, n);
            swap((a+i), (a+j));
        }
    }
}
```

- i. isEmpty (Q) — returns true if the queue is empty, false otherwise.
- ii. delete (Q) — deletes the element at the front of the queue and returns its value.
- iii. insert (Q, i) — inserts the integer i at the rear of the queue.

Consider the following function:

```
void f (queue Q) {  
    int i;  
    if (isEmpty(Q)) {  
        i = delete(Q);  
  
        f(Q);  
        insert(Q, i);  
    }  
}
```

What operation is performed by the above function f ?

- (A) Leaves the queue Q unchanged
- (B) Reverses the order of the elements in the queue Q
- (C) Deletes the element at the front of the queue Q and inserts it at the rear keeping the other elements in their original order
- (D) Empties the queue Q

Q4. Given the following input (4322, 1334, 1471, 9679, 1989, 6171, 6173, 4199) and the hash function  $h(x) = x \mod 1000$ , which of the following statements are true?

- i. 9679, 1989, 4199 hash to the same value
- ii. 1471, 6171 hash to the same value
- iii. All elements hash to the same value
- iv. Each element hashes to a different value

```
i = 70;  
x = 25;  
y = y + 1;  
}
```

Which one of the following options represents the correct output of the program mechanisms?

- (A) Call by value : i = 30, j = 20; Call by reference : i = 30, j = 20
- (B) Call by value : i = 100, j = 25; Call by reference : i = 70, j = 90
- (C) Call by value : i = 70, j = 20; Call by reference : i = 25, j = 45
- (D) Call by value : i = 25, j = 95; Call by reference : i = 70, j = 90

Q29. Which of the following is true for computation time in insertion, deletion element in a sorted array ?

- (A) Insertion – O(n), Deletion – O(n), Maximum – O(1), Minimum – O(1)
- (B) Insertion – O(1), Deletion – O(1), Maximum – O(n), Minimum – O(n)
- (C) Insertion – O(1), Deletion – O(1), Maximum – O(1), Minimum – O(l)
- (D) Insertion – O(n), Deletion – O(n), Maximum – O(n), Minimum – O(n)

**Q1.** Suppose you are given an array  $s[1 \dots n]$  and a procedure reverse between positions  $i$  and  $j$  (both inclusive).

do, where  $1 < k \leq n$ :

reverse ( $s$ , 1,  $k$ );

reverse ( $s$ ,  $k + 1$ ,  $n$ );

reverse ( $s$ , 1,  $n$ );

What does the following sequence do, where  $1 \leq k \leq n$ ?

- (A) Rotates  $s$  left by  $k$  positions
- (B) Leaves  $s$  unchanged
- (C) Reverses all elements of  $s$
- (D) None of the above

**Q2.** The most appropriate matching for the following p

X: depth first search

1: hea

Y: breadth-first search

Z: sorting

```
{  
void msg(){  
System.out.println("Hello");  
}  
}  
class B extends A  
{  
void msg(){  
System.out.println("Welcome");  
}  
public static void main(String args[])  
{  
A a=new A();  
B b=new B();  
A obj=new B();  
System.out.println(a.msg());  
System.out.println(obj.msg());  
System.out.println(b.msg());  
}
```

• Please do not write anything on the question paper

**Q1.** Suppose you are given an array  $s[1 \dots n]$  and a procedure reverse ( $s, i, j$ ) which reverses the elements between positions  $i$  and  $j$  (both inclusive).

do, where  $1 < k \leq n$ :

reverse ( $s, 1, k$ );

reverse ( $s, k + 1, n$ );

reverse ( $s, 1, n$ );

What does the following sequence do, where  $1 \leq k \leq n$ ?

- (A) Rotates  $s$  left by  $k$  positions
- (B) Leaves  $s$  unchanged
- (C) Reverses all elements of  $s$
- (D) None of the above

**Q2.** The most appropriate matching for the following pairs

X: depth first search      1: heap

Y: breadth-first search      2: queue

Z: sorting      3: stack

is

- (A) X—1 Y—2 Z—3
- (B) X—3 Y—1 Z—2
- (C) X—3 Y—2 Z—1
- (D) X—2 Y—3 Z—1

**Q5.** The most appropriate matching for the following pairs.

- |                              |              |
|------------------------------|--------------|
| X: Indirect addressing       | 1 : Loops    |
| Y: Immediate addressing      | 2 : Pointers |
| Z: Auto decrement addressing | 3. Constants |

is

- (A) X-3, Y-2, Z-1
- (B) X-1, Y-3, Z-2
- (C) X-2, Y-3, Z-1
- (D) X-3, Y-1, Z-2

**Q6.** An implementation of a queue Q, using two stacks S1 and S2, is given below.

```
void insert(Q, x) {
    push (S1, x);
}

void delete(Q){
    if(stack-empty(S2)) then
        if(stack-empty(S1)) then {
            cout("Q is empty");
            return;
        }
    while (!(stack-empty(S1))){
        pop(S1, x);
        push(S2, x);
    }
}
```

Q8. Consider the following statements:

- S1: A queue can be implemented using two stacks.
- S2: A stack can be implemented using two queues.

Which of the following is correct?

- (A) S1 is correct and S2 is not correct.
- (B) S1 is not correct and S2 is correct.
- (C) Both S1 and S2 are correct.
- (D) Both S1 and S2 are incorrect.

Q10. What will be the output for `arrayTraverse(new int[]{4,2,5,1,3},0)` ?

```
public static void arrayTraverse(int array[],int pos)
```

```
{
```

```
    if(pos >= 0 && pos < array.length)
```

```
{
```

```
    arrayTraverse(array , pos*2+1);
```

```
    System.out.print(array[pos]+",");
```

```
    arrayTraverse(array, pos*2+2);
```

```
}
```

```
}
```

Q11. Which of the following permutation can be obtained in the same order using sequence 5, 6, 7, 8, 9 in that order?

(A) 7, 8, 9, 5, 6

(B) 5, 9, 6, 7, 8

(C) 7, 8, 9, 6, 5

(D) 9, 8, 7, 5, 6

Q12. Predict the output of the following program

```
#include<stdio.h>
```

```
void main()
```

```
{
```

```
public static void main(String[] args)
{
    int x=10;
    switch(x)
    {
        case 5: x+= 5;
        case 10: x+=10;
        case 15: x+=15;
        case 20: x+=20;
    }
    System.out.println(x);
}
```

Q19. Which of the following is/are application(s) of Stack Data Structure?

- (A) Load Balancing
- (B) When data is transferred asynchronously (data not necessarily received a processes
- (C) Managing function calls
- (D) Both (B) and (C)

Q20. Find the missing condition (in Line 8) for the function to product th public static void main(String[] args)

```
{
    int x=1,y=0,n=10;
    System.out.println(recursion(x,y,n));
}
```

static int recursion(int a,int b, int n)

```
{
    if(_____) /* Line 8 */
}
```

- (B) An array
- (C) An array of 500 numbers
- (D) A dynamically allocated array of 550 numbers

Q15. What is the output of the following program?

```
public class Test extends Thread
```

```
{
```

```
    public void run()
```

```
{
```

```
    System.out.printf("Test ");
```

```
}
```

```
    public static void main(String[] args)
```

```
{
```

```
    Test test = new Test();
```

```
    test.run();
```

```
    test.start();
```

```
}
```

```
}
```

(A) Compilation error

(B) Runtime error

(C) Test

(D) Test Test

Q16. What is the output of the following program?

```
class Test
```

```
{
```

```
push(32,x)
```

```
}
```

```
x.pop(32)
```

```
}
```

Let n insert and m pop() delete operations be performed in an arbitrary order on an empty queue. If all m and n?

- (A)  $x \leftarrow x + 1$  and  $2m \leftarrow y \leftarrow 1 + m$
- (B)  $x \leftarrow x + 1$  and  $2m \leftarrow y \leftarrow 2n$
- (C)  $2m \leftarrow x + 2n$  and  $2m \leftarrow y \leftarrow 1 + m$
- (D)  $2m \leftarrow x + 2n$  and  $2m \leftarrow y \leftarrow 2n$

9. Com

1. A

2. A

3.

4.

5.

Q7. Which of the following is false about a doubly linked list?

- (A) It takes more space than a singly linked list
- (B) Navigation is possible in both directions
- (C) The insertion and deletion of a node take a bit longer
- (D) None of the mentioned

Q8. Consider the following function definition

```
int Trial (int a, int b, int c)
```

```
{  
    if ((a >= b) && (c < b)) return b;  
    else if (a >= b) return Trial(a, c, b);  
    else return Trial(b, a, c);
```

```
}
```

The function Trial:

- (A) finds the maximum of a, b and c
- (B) finds the minimum of a, b and c
- (C) finds the middle number of a, b and c
- (D) None of the above

```
int a=4, b=7, c=7;  
switch(b%c)  
{  
    case 0 : a = b + c;  
    case 1 : a = a+b;  
    case 4 : a++;  
    case 7 : a = a + +b;  
    default : a = a + c- ;  
}  
  
printf("%d",a);  
}
```

Q13. What is the output of following function for start pointing to first node of following linked list?

```
void fun(struct node* start)  
{  
    if(start == NULL)  
        return;  
    printf("%d ", start->data);  
    if(start->next != NULL )  
        if(start->next->next);  
        printf("%d ", start->next->data);  
}
```

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```
int i;
program main () {
    int j = 20;
    i = 30;
    call f (i, j);
    print i, j;
}

function f (x, y) {
    i = 70;
    x = 25;
    y = y + i ;
}
```

Which one of the following options represents the correct output of the program for mechanisms?

- (A) Call by value :  $i = 30, j = 20$ ; Call by reference :  $i = 30, j = 20$
- (B) Call by value :  $i = 100, j = 25$ ; Call by reference :  $i = 70, j = 90$
- (C) Call by value :  $i = 70, j = 20$ ; Call by reference :  $i = 25, j = 45$
- (D) Call by value :  $i = 25, j = 95$ ; Call by reference :  $i = 70, j = 90$

**Q29.** Which of the following is true for computation time in insertion, deletion of element in a sorted array ?

- (A) Insertion –  $O(n)$ , Deletion –  $O(n)$ , Maximum –  $O(1)$ , Minimum –  $O(1)$
- (B) Insertion –  $O(1)$ , Deletion –  $O(1)$ , Maximum –  $O(n)$ , Minimum –  $O(n)$

```
    000 00000  
    000 00001  
    000 00002  
    000 00003  
  
    System.out.println("000");  
    i  
    if (x >)  
    {  
        System.out.println("001");  
        j  
        if (y <= 0)  
        {  
            System.out.println("002");  
            k  
            if (z > 0)  
            {  
                System.out.println("003");  
            }  
        }  
    }  
    else  
    {  
        System.out.println("004");  
    }  
}
```

```
public static void main(String[] args) {
    int x = 0;
    int y = 0;
    System.out.println(x + y);
    System.out.println(x * y);
    System.out.println(x / y);
    System.out.println(x % y);
    System.out.println(x + y);
    System.out.println(x * y);
    System.out.println(x / y);
    System.out.println(x % y);
}
```

Q9. Find the output by the following program

```
public static void main(String[] args) {
    int n = recursive(5);
    System.out.println(n);
}
```

public int recursive (int n)

```
{
```

```
    if (n == 1)
        return 1;
    else
        return recursive (n - 1) + recursive (n - 1);
```

- (B) ii only  
(C) i and ii only  
(D) iii or iv

Q5. The most appropriate matching for the following pairs:

- X: Indirect addressing  
Y: Immediate addressing  
Z: Auto decrement addressing

- 1: Loops  
2: Pointers  
3: Constants

is

- (A) X-3, Y-2, Z-1  
(B) X-1, Y-3, Z-2  
(C) X-2, Y-3, Z-1  
(D) X-3, Y-1, Z-2

Q6. An implementation of a queue Q, using two stacks S1

```
void insert(Q, x) {  
    push (S1, x);  
}
```

```
void delete(Q){  
    if(stack-empty(S2)) then  
        if(stack-empty(S1)) then {  
            print("Q is empty");  
            return;  
        }
```

```
else while (!(stack-empty(S1))){  
    x=pop(S1);
```

```
public static void main(String[] args)
{
    int x=10;
    switch(x)
    {
        case 5: x+= 5;
        case 10: x+=10;
        case 15: x+=15;
        case 20: x+=20;
    }
    System.out.println(x);
}
```

Q19. Which of the following is/are application(s) of Stack Data Structure?

- (A) Load Balancing
- (B) When data is transferred asynchronously (data not necessarily received by processes)
- (C) Managing function calls
- (D) Both (B) and (C)

Q20. Find the missing condition (in Line 8) for the function to print

```
public static void main(String[] args)
```

```
{
```

```
int x=1,y=0,n=10;
```

```
System.out.println(recursion(x,y,n));
```

```
}
```

```
static int recursion(int a,int b, int n)
```

```
{
```

```
if(_____) /* Line 8 */
```

Q21. Which of the following statements are true?

- (A) If A is true and B is true then the output is "A & B"
- (B) If A is true and B is false then the output is "noB"
- (C) If A is false and B is true then the output is "ELSE"
- (D) If A is false and B is false then the output is "ELSE"

Q22. What pattern of output will the program produce?

```
int factPattern(int x) {  
    return x << 1;  
}
```

- (A)  $x + 2$
- (B)  $x - 2$
- (C)  $x ^ 2$
- (D)  $x/2$

Q23. Predict the output

```
int main() {  
    int x = 0, y = 0;  
    if(x > 0)  
        if(y > 0)  
            printf("True");  
        else  
            printf("False");  
}
```

(A) No Output

(B) True

```

main()
{
    int x = 100;
    int i = 30;
    call f(x, i);
    print i, x;
}

function f(x, y)
{
    i = 70;
    x = 25;
    y = y + i;
}

```

Which one of the following options represents the correct output of the program for the two parameter passing mechanisms?

- (A) Call by value :  $i = 30, j = 20$ ; Call by reference :  $i = 30, j = 20$
- (B) Call by value :  $i = 100, j = 25$ ; Call by reference :  $i = 70, j = 90$
- (C) Call by value :  $i = 70, j = 20$ ; Call by reference :  $i = 25, j = 45$
- (D) Call by value :  $i = 25, j = 95$ ; Call by reference :  $i = 70, j = 90$

**Q29.** Which of the following is true for computation time in insertion, deletion and finding maximum and minimum element in a sorted array ?

- (A) Insertion –  $O(n)$ , Deletion –  $O(n)$ , Maximum –  $O(1)$ , Minimum –  $O(1)$
- (B) Insertion –  $O(1)$ , Deletion –  $O(1)$ , Maximum –  $O(n)$ , Minimum –  $O(n)$
- (C) Insertion –  $O(1)$ , Deletion –  $O(1)$ , Maximum –  $O(1)$ , Minimum –  $O(1)$
- (D) Insertion –  $O(n)$ , Deletion –  $O(n)$ , Maximum –  $O(n)$ , Minimum –  $O(n)$

- (C) An expression (i.e.  $i < 10$ ) in all the above  
(D) None of the above is correct

Q25. Consider the problem of searching an element in an array which is sorted and rotated by  $k$ .  $k$  is NOT given to you. What is the time complexity of the search?

- (A) 1 Only  
(B) 1 & 2 only  
(C) 1, 2 and 3 only  
(D) 1, 2, 3 and 4

Q26. Which of the following tree traversal uses a stack data structure?

- (A) Preorder  
(B) Inorder  
(C) Postorder  
(D) Level order

Q27. What pattern of output will the program produce?

```
int findPattern(int x) {  
    return x << 1;  
}
```

- (A)  $x + 2$   
(B)  $x - 2$   
(C)  $x * 2$   
(D)  $x/2$

Q28.

Consider the program below in a hypothetical language which allows

```
/*Program Statement 1 with for loop*/
for (i = 0; i < 100; i++)
{
    /*Statement1*/
    /*Statement2*/
    /*Statement3*/
}

/*Program Statement 2 with while loop*/
i = 0;
while (i < 100)
{
    /*Statement1*/
    continue;
    /*Statement2*/
}
/*Program Statement 3 with do-while loop*/
do
{
    /*Statement1*/
    continue;
    /*Statement2*/
} while (i < 100);
```

Which of the following statements are correct?

- (A) All the loops are equivalent i.e. any of the three can be chosen and they all will perform exactly the same.
- (B) continue can't be used with all the three loops in C.

```
}
```

```
/*Program Snippet 2 with while loop*/
```

```
i = 0;
```

```
while (i < 10)
```

```
{
```

```
/*statement1*/
```

```
continue;
```

```
/*statement2*/
```

```
i++;
```

```
}
```

```
/*Program Snippet 3 with do-while loop*/
```

```
i = 0;
```

```
do
```

```
{
```

```
/*statement1*/
```

```
continue;
```

```
/*statement2*/
```

```
i++;
```

```
}while (i < 10);
```

Which of the following statements are correct ?

- (A) All the loops are equivalent i.e. any of the three can be chosen and they a
- (B) continue can't be used with all the three loops

- This question paper has two sections with a total of 20 questions
- Section A is a programming test with 10 questions for 35 minutes
- Section B is an aptitude test with 10 questions for 35 minutes
- Please do not write anything on the question paper
- It is advised to write the rough work in a separate paper with pen

### Section A - Programming

(Assume that all the programs are compiled in a 32 bit GCC compiler. i.e  
There are no syntax and compilation errors in any of the questions.

1) Find the output of the following

```
#include <stdio.h>

int f(int x, int *py, int **ppz)
{
    int y, z;
    **ppz += 1;
    z = **ppz;
    *py += 2;
    y = *py;
    x += 3;
    return x + y + z;
}

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

**Question Code:**

2) Find the output of the following

```
#include <stdio.h>

int main()
{
    enum status { IT,CSE,EEE };
    enum status stud1, stud2, stud3;
    stud1 = IT;
    stud2 = CSE;
    stud3 = EEE;
    printf("%d %d %d", stud3++, --stud1, stud2);
}
```

3) Find the output of the following

```
#include <stdio.h>

int f(int *a, int n)
{
    if(n <= 0) return 0;
    else if(*a % 2 == 0) return *a + f(a+1, n-1);
    else return *a - f(a+1, n-1);
}

int main()
{
    int a[] = {12, 7, 13, 4, 11, 6};
    printf("%d", f(a, 6));
}
```

4) Find the output of the following

```
#include <stdio.h>

int main()
{
    int num1 = 5;
    int num2 = 3;
    int num3 = 2;
    num1 = num2++;
    num2 = --num3;
    printf("%d %d %d", num1, num2, num3);
    return 0;
}
```

**Question Code: MI**

8) Find the output of the following

```
#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);
}

int main()
{
    x=5;
    P(&x);
    print(x);
}
```

9) Find the output of the following

```
#include <stdio.h>

int fun()
{
    static int num = 16;
    return num--;
}

int main()
{
    for(fun(); fun(); fun())
        printf("%d ", fun());
}
```

Question Code: 1

5) Find the output of the following

```
#include <stdio.h>

int fun(int a[], int n)
{
    int x;
    if(n == 1)
        return a[0];
    else
        x = fun(a, n-1);
    if(x > a[n-1])
        return x;
    else
        return a[n-1];
}
int main()
{
    int arr[] = {12, 10, 30, 50, 100};
    printf("%d ", fun(arr, 5));
    return 0;
}
```

6) Find the output of the following

```
#include <stdio.h>
int main(void)
{
    int a;
    int i = 4;
    a = 24 || --i;
    printf("%d %d", a, i);
    return 0;
}
```

7) Find the output of the following

```
#include <stdio.h>

int main()
{
    char *s = "Zoho Corp";
    int n = 6;
    printf("%.*s", n, s);
    return 0;
}
```

10) Find the output of the following

```
#include <stdio.h>

#define print(x) printf ("%d ", x)

void foo(int n, int sum)
{
    int k = 0, j = 0;
    if (n == 0) return;
    k = n % 10;
    j = n / 10;
    sum = sum + k;
    foo (j, sum);
    printf ("%d,", k);
}
int main ()
{
    int a = 2048, sum = 0;
    foo (a, sum);
    printf ("%d\n", sum);
}
```

Que

---

### Section B - Aptitude

---

1. In how many different ways can the letters of the word 'Oxford' be arranged so that the vowels always come together?

**Duration :** 1 hour 30 minutes

**Note :** 1. SECTION A has more weightage  
2. There are no syntax errors in the given programs

## **SECTION A**

**Question 1:** Find the first repeated character of a given String and its number of occurrences

**Examples:**

Sample Input 1 : "i gave an apple"

Sample Output 1 : 'a' 3

Sample Input 2 : "hold me high"

Sample Output 2 : 'h' 3

**Question 2:** Find the nearest square number of the array element for the given position and

store it in the start of the array & sort the remaining elements of the array.

**Example:**

Input: {45, 23, 11, 57, 68, 32} & Position: 2 (Here position 2 refers to number 23)

Output: {25, 11, 32, 45, 57, 68}

Input: {45, 23, 11, 57, 68, 32} & Position: 4

Output: {64, 11, 23, 32, 45, 68}

**Question 3:** Display the diagonal pattern for the string of odd length.

Sample Input 1:

Enter the string : racecar

Sample Output 2:

```
      e  
     c   c  
    a     a  
   r       r  
  a       a  
 c       c  
      e
```

Sample Input 2 :

Enter the string : football

Sample Output 2:

Not Possible

**Question 4:** Divide the given array into two arrays such that both arrays have equal averages.

**Examples:**

Sample Input 1 :

2 4 8 10 16

Sample Output 1 :

8

2 4 10 16

Sample Input 2 :

1 3 3 2 1 2

Sample Output 2 :

1 2 3

1 2 3

Sample Input 3 :

1 4

Sample Output 3 :

Not Possible

Sample Input 1:

```

3
34
0110
1111
0123
015
22
11
11
018
44
1234
1234
1234
1234
1324
029

```

Question 5 :

Given a 2D screen, location of a pixel in the screen  $le(x,y)$  and a color( $K$ ), your task is to replace color of the given pixel and all adjacent(excluding diagonally adjacent) same colored pixels with the given color  $K$ .

Example:

```

{{1, 1, 1, 1, 1, 1},  

 {1, 1, 1, 1, 1, 0},  

 {1, 0, 1, 1, 0, 1},  

 {1, 2, 2, 2, 0, 1},  

 {1, 1, 1, 2, 0, 1},  

 {1, 1, 1, 2, 2, 2, 0},  

 {1, 1, 1, 1, 1, 2, 1},  

 {1, 1, 1, 1, 1, 2, 1},  

 };  

x=4,y=4, color=3  

{{1, 1, 1, 1, 1, 1},  

 {1, 1, 1, 1, 1, 0},  

 {1, 0, 1, 1, 0, 1},  

 {1, 3, 3, 3, 0, 1},  

 {1, 1, 1, 3, 0, 1},  

 {1, 1, 1, 3, 3, 3},  

 {1, 1, 1, 1, 1, 1},  

 {1, 1, 1, 1, 3, 3, 1},  

 };  

0550
5555
0523
88
88
1294
1294
1294
1324

```

Sample Output 1:

```

0550
5555
0523
88
88
1294
1294
1294
1324

```

Input:

The first line of input contains an integer  $T$  denoting the no of test cases. Then  $T$  test cases follow. The first line of each test case contains Two integers  $N$  and  $M$  denoting the size of the matrix. Then in the next line are  $N*M$  space separated values of the matrix. Then in the next line are three values  $x, y$  and  $K$ .

**Question 6:** Write a program that outputs all possibilities to put + or - or nothing between the numbers 1,2,...,9 (in this order) such that the result is 100.

Example:

```

1 + 2 + 3 - 4 + 5 + 6 + 78 + 9 = 100.

```

Output:

For each test case print the space separated values of the new matrix.  
Constraints:  
 $1 \leq T \leq 100$   
 $1 \leq M[i] \leq 100$

continued in the next page...

1. Read the question and understand it clearly before you start writing the program. In case of any doubts, get them clarified with your invigilator.
2. The input should not be hard coded inside the program. The program should work with any input without changing the program for each input.
3. Programs logic, coding standards, modularity will be considered for evaluation.
4. Programs should work with all the sample inputs given in this sheet.
5. Java or C/C++/C# can be used for writing the programs.

#### General instructions

Zoho Programming Test Duration : 2Hrs Work - Online



Zoho Programming Test

Input : onechar  
Output : o , 1 time

Input : mississippi  
Output : s , 4 times [since char 's' is the first char which occurs 4 times]

Input : occurrence  
Output : c , 3 times  
e.g:

- should be given to the first most occurrence character when two character has same number of occurrences.
1. Write a program to find the character which has most occurrence in a given string. Priority

## Programming Test

Duration: 60 mins



### General Instructions

1. Read the question and understand it clearly before you start writing the program. In case of any doubts, get them clarified with your invigilator.
2. The input should not be hard coded inside the program. The program should work with any input without changing the program for each input.
3. Programs logic, coding standards, modularity will be considered for evaluation.
4. Programs should work with all the sample inputs given in this sheet.
5. Java or C/C++/C# can be used for writing the programs.

- 1) Write a program that compares two app versions to detect if it is an upgrade or downgrade.

Sample Input/Output:

Input :	Version 1 = 9.0.23	Version 2 = 9.0.24	Output :	Upgraded	Input :	Version 1 = 1.0.15	Version 2 = 1.1.15	Output :	Downgraded	Input :	Version 1 = 4.0.1	Version 2 = 4.0.0	Output :	Equal	

- 3) Given an input string and a dictionary of words, find out if the input string can be segmented into a space separated sequence of dictionary words. See following examples for more details.

### Example :

Consider the following dictionary

{ i, like, sam, sung, samsung, mobile, ice, cream, icecream, man, go, mango}

### Input:

i like

### Output:

i like samsung  
i like sam sung

Input :	Output:
abcd , a*c	true
spoon , sp*n	true
regex , re*g	true
search , *c	true
zoho , *o*	true
zoho , *ogo	false
test , pest	false
s*t , t*t	true
star , t*r	false
tree , t\	false
tre , t\	true

- 2) Write a program that takes two arguments at the command line, both strings. The program checks to see whether or not the second string is a substring of the first (without using the substr or any other library function). One caveat: any '\*' in the second string can match zero or more characters in the first string, so if the input were abcd and the substring were a\*c, then it would count as a substring. (Also, include functionality to allow an asterisk to be taken literally if preceded by a '\', and a '\' is taken literally except when preceding an asterisk.

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

```
#include<stdio.h>
#include<string.h>

void calculate(char *a, int i, int n);
void swap (char *x, char *y);
int m = 0;
void main()
{
    char str[10] = "India" ;
    int len=0;
    len = strlen(str);
    calculate(str, 0, len-1);
    printf("%d\n",m);

}

void swap (char *x, char *y) {
    char temp;
    temp = *x;
    *x = *y;
    *y = temp;
}

void calculate(char *a, int i, int n) {
    int j=0;
    if (i == n){
        m++;
    }
    else {
        for (j = i; j <= n; j++){
            swap((a+i), (a+j));
            calculate(a, i+1, n);
            swap((a+i), (a+j));
        }
    }
}
```

```

#include<string.h>
int main()
{
    int nf,i,j,c,m;
    char str[]={"Zoho Corporation - Chennai"};
    int length = strlen(str);
    i=0,m=0,c=0;

    while(str[i]!='\0' && i <= length)
    {
        j=i;
        c=0;
        while((str[j]!=' ')&&(str[j]!='\0')){
            j++;
        }
        i=j+1;
        while(~j && str[j] != ' ')
        {
            if ( str[j] == 'o'){
                c++;
            }
        }
        if ( m < c ) m = c;
    }
    printf("%d \n", m);
}

```

14. What will be the output of the following program? (2 marks)

```

#include<stdio.h>
void main()
{
    int arr[] = {-3,1,2,3,2,-3,2};
    int i,j, k=1,s=6;
    for(i=1;i<s;i++)
    {
        for(j=0;j<k;j++)
        {
            if(arr[i] == arr[j])
                break;
        }
        if(j==k)
            arr[k++] = arr[i];
    }
    for(i=0;i < k;i++)
        printf("%d ",arr[i]);
}

```

11. What will be the output of the following program? (2 marks)

```
#include<stdio.h>
#include <string.h>
void main(){
    int table[2][4];
    int m = 5, n = 1, x = 3, i = 0, j = 0, k = 0;
    memset(table, 0, sizeof(table)); //Initialize all entries as 0
    for (j = 1; j <= m && j <= x; j++) {
        table[1][j] = 2;
    }
    for (i = 2; i <= n; i++) {
        for (j = 1; j <= x; j++) {
            for (k = 1; (k <= m && k < j); k++) {
                table[i][j] += table[i-1][j-k];
            }
        }
    }
    printf("%d\n", table[n][x]);
}
```

12. What will be the output of the following program? (2 marks)

```
#include <stdio.h>
int find(int j)
{
    if(j>1)
    {
        j=find(j/10)-(j%10);
        printf("%d \t",j);
    }
    else {
        j=0;
    }
    return j;
}

void main()
{
    int i=7547;
    int k;
    k=find(i);
}
```

8. What will be the output of the following program? (1 mark)

```
#include<stdio.h>
void main()
{
    int b = 9093;
    int a = 0;
    while (b > 0) {
        a = a + (b % 10);
        b = b / 10;
    }
    printf("%d",a);
}
```

9. What will be the output of the following program? (1 mark)

```
#include<stdio.h>
void main()
{
    int a[3][4] = {2,4,6,8,10,12,12,10,8,6,4,2};
    int i = 0, j, k = 13;
    while(i<3)
    {
        for(j=0;j<4;j++)
        {
            if(a[i][j]>k)
            {
                k=a[i][j];
            }
        }
        i++;
    }
    printf("%d",k);
}
```

10. What will be the output of the following program? (1 mark)

```
#include <stdio.h>
#include <string.h>
struct test
{
    char s[10];
}t;
void func (struct test t)
{
    strcpy(t.s, "Chennai");
}
void main (void)
{
    strcpy(t.s, "Zoho");
    printf("%s ", t.s);
    func(t);
    printf("%s ", t.s);
}
```

4. What is the output of the method for the following program? (1 mark)

```
#include <stdio.h>
void main(){
    int n;
    for (n = 5; n != 0 ; n--){
        printf("%d ,", n);
    }
}
```

5. What will be the output of the following program? (1 mark)

```
#include<stdio.h>
void main() {
    int c[]={1,2,3,4};
    int j,*q=c;
    for(j=0;j<4;j++){
        printf("%d ",*c);
        ++q;
    }
}
```

6. What will be the output of the following program? (1 mark)

```
#include<stdio.h>
int a[]={2,4,6};
int* f(void)
{
    int i;
    for(i=0;i<3;i++)
        return a+1;
}
void main(void){
    *f()=12;
    printf("%d %d %d ",a[0],a[1],a[2]);
}
```

7. What will be the output of the following program? (1 mark)

```
#include <stdio.h>
#include <stdlib.h>
void main (void)
{
    int *a, i;
    a = (int *) malloc ( 5 * sizeof(int));
    for (i=0; i<5; i++)
        *(a + i) = i * i;
    for (i=0; i<5; i++)
        printf("%d ", *a++);
    free(a);
}
```

**Section A - Programming**

1. What will be the output of the following program? (1 mark)

```
#include <stdio.h>
void main(){
    int i=0,j=0,sum = 0;
    for(i=1; i<800; i*=3)
        for(j=0; j<i;j++)
            sum++;
    printf("%d",sum);
}
```

2. What will be the output of the following program? (1 mark)

```
#include<stdio.h>
int max(int x, int y){
    return (y > x)? y : x;
}
void main(){
    int a[] = {-6, -3, 8, -1, -2, 1, 5, -3};
    int z = a[0], n=8, i=0,c=a[0];
    for (i = 1; i < n; i++) {
        c = max(a[i], c+a[i]);
        z = max(z, c);
    }
    printf("%d \n", z);
}
```

3. What will be the output of the following program? (1 mark)

```
#include <stdio.h>
void main(){
    int s[] = {9, 7, 5, 3, 1, 0};
    int f[] = {2, 4, 6, 8, 10, 12};
    int n = 6,i=0,j=1;
    for (j = 1; j < n; j++) {
        if (s[j] >= f[i]) {
            printf( "%d ", i);
            i = j;
        }
    }
}
```

Programs compiles and runs successfully.

- 1) What will be the output of the following program?

```
# include <stdio.h>
int main() {
    int i=0;
    for(i=0; i<20; i++) {
        switch(i) {
            case 0:
                i+=5;
            case 1:
                i+=2;
            case 5:
                i+=5;
            default:
                i+=4;
                break;
        }
        printf("%d ", i);
    }
    return 0;
}
```

- 2) What will be the output of the following program?

```
#include <stdio.h>
#define square(x) x*x
int main()
{
    int i;
    i = 64/square(4);
    printf("%d",i);
}
```

5) What will be the output of the following program?

```
#include<stdio.h>

int main(){
    char* str = "Hello World";
    int i;
    int len = strlen(str);
    for(i = 0 ; i <= len ; i++)
    {
        printf("%c",str[len-i]);
    }
    return 0;
}
```

6) What will be the output of the following program?

```
#include <stdio.h>
struct module1
{
    unsigned int x: 5;
    unsigned int y: 8;
}m1;
struct module2
{
    unsigned int x: 5;
    unsigned int: 0;
    unsigned int y: 8;
}m2;

int main()
{
    printf(" %d %d\n", m1.x++-++m2.x, m1.y+m2.y++);
    return 0;
}
```

Zoho Programming Test L1

Question Code : ZOHO\_L1\_600

- 7) What is the output of this program on an implementation where int occupies 2 bytes?

```
#include <stdio.h>
int main(void) {
    int i = 3;
    int j;
    j = sizeof(++i + ++i);
    printf("i=%d j=%d\n", i, j);
    return 0;
}
```

- 8) What will be the output of the following program?

```
#include <stdio.h>
int main()
{
    char s[ ]="zoho";
    int i;
    for(i=0;s[ i ];i++)
        printf("\n%c%c%c%c",s[ i ],*(s+i),*(i+s),i[s]);
}
```

```
#include<stdio.h>
#include<string.h>
int main()
{
    char str1[] = "zohocorp.com";
    char str2[29] = "";
    strcpy(str2, str1, 8);
    printf("%s", str2);
    return 0;
}
```

- 10) What will be the output of the following program?

```
#include<stdio.h>
int main()
{
    void fun(char* );
    char a[100];
    a[0] = 'Z'; a[1] = 'O';
    a[2] = 'H'; a[3] = 'O';
    fun(&a[0]);
    return 0;
}
void fun(char *a) {
    a++;
    printf("%c", *a);
    a++;
    printf("%c", *a);
}
```

- 1) A, B, C and D are four consecutive numbers which are divisible by 4, and their average is 42. the what is the product of B and D?
- 2) The Average weight of the A and B is 36, and average weight of A, B and C is 31, then what is the weight of the C?
- 3) Find the single discount equivalent to successive discount of 20%, 10% and 5%?
- 4) One-year payment to the servant is Rs. 200 plus one shirt. The servant leaves after 9 months and receives Rs. 120 and a shirt. Then find the price of the shirt.
- 5) The maximum allocated size of a queue in a computer program is 1Gb (1024 Mb). Functions A and B push data into the queue at 4Mb/s and 2Mb/s. Functions C and D pops data (takes data) from the queue at 3Mb/s and 1Mb/s respectively for processing. At the start of the program execution, functions A and B push data into the queue at the same time. When the queue is 720Mb full, function C is activated and pops data from the queue for processing and when the queue is 900Mb full, function D is activated. At what time will the queue overflow ?
- 6) What is the angle between the hour and minute hand of the clock when the time is 6:00?
- 7) A tank can be filled by pipe A in 30 minutes & by pipe B in 24 minutes. Outlet pipe C can empty the full tank in 1 hour & 20 minutes. If the tank is empty initially and if all the 3 pipes A, B & C are opened simultaneously, in how much time will the tank be full?
- 8) A red light flashes 3 times per minute and a green light flashes 5 times in two regular intervals. If both lights start flashing at the same time, how many times do they flash together in each hour?
- 9) At a party, everyone shook hands with everybody else. There were 120 handshakes. How many people were at the party?

```
#include<stdio.h>
int i = 0;
int fun(int n){
    i++;
    if(n > 90)
        return n - 20;
    return fun(fun(n + 21));
}
void main() {
    printf("%d\n", fun(87));
    printf("%d\n", i);
}
```

4) What will be the output of the following program?

```
#include<stdio.h>
int main()
{
    int i=4, j=8;
    i = i|j&j|i + i|j&j|i - i^j;
    j = i|i&j|j + j|j&i|i - j^j;
    printf("%d, %d, %d\n", i|j&j|i, i|j&j|i, i^j);
    return 0;
}
```

10) Alex gets on the elevator at the 3rd floor of a building and rides up at the rate of 16 floors per minute. At the same time, Bob gets on an elevator at the 60th floor of the same building and rides down at the rate of 22 floors per minute. If they continue travelling at these rates, then at which floor will their paths cross ?

11) A Contractor employed a certain number of workers to finish constructing a road in a certain scheduled time. Sometime later, when a part of work had been completed, he realized that the work would get delayed by three-fourth of the scheduled time, so he at once doubled the no of workers and thus he managed to finish the road on the scheduled time. How much work he had been completed, before increasing the number of workers?

12) A toy was sold at a loss of 17%. It was observed that if the selling price was Rs.340/- more, then the profit made would have been 66%. What is the actual selling price of the toy?

13) On every Friday Amar, Akbar and Anthony lunch together at Punjabhi-Dhaba where they order lassi based on following facts. 1. Unless neither Amar nor Akbar have lassi, Anthony must have it. 2. If Amar does not have lassi, either Akbar or Anthony or both have it. 3. Anthony has lassi only if either Amar or Akbar or both have it. 4. Akbar and Anthony never have lassi together. Of the 3, who never orders lassi?

14) A bottle contains a mixture of two liquids A and B is the ratio 7 : 5. When 9 liters of mixture is drawn off and the bottle is filled with B, the ratio of A and B becomes 7 : 9. How many liters of liquid B was initially contained in the bottle ?

A motorboat, whose speed is 15 km/hr in still water, goes 30 km downstream and comes back in a total of 4 hours 30 minutes. What is the speed of the stream (in km/hr) ?

11. What will be the output of the following program? (2 marks)

```
#include <stdio.h>
#include <string.h>
void main(){
    int table[2][4];
    int m = 5, n = 1, x = 3, i = 0, j = 0, k = 0;
    memset(table, 0, sizeof(table)); //Initialize all entries as 0
    for (i = 1; i <= m && j <= x; j++) {
        table[i][j] = 2;
    }
    for (i = 2; i <= n; i++) {
        for (j = 1; j <= x; j++) {
            for (k = 1; (k <= m && k < i); k++) {
                table[i][j] += table[i-1][j-k];
            }
        }
    }
    printf("%d\n", table[n][x]);
}
```

12. What will be the output of the following program? (2 marks)

```
#include <stdio.h>
int find(int j)
{
    if(j>1)
    {
        j=find(j/10)-(j%10);
        printf("%d \t",j);
    }
    else {
        j=0;
    }
    return j;
}
```

d main()

```
int i=7547;
int k;
k=find(i);
```

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

```
#include<stdio.h>
#include<string.h>

void calculate(char *a, int i, int n);
void swap (char *x, char *y);
int m = 0;
void main()
{
    char str[10] = "India" ;
    int len=0;
    len = strlen(str);
    calculate(str, 0, len-1);
    printf("%d\n",m);

}

void swap (char *x, char *y) {
    char temp;
    temp = *x;
    *x = *y;
    *y = temp;
}

void calculate(char *a, int i, int n) {
    int j=0;
    if (i == n){
        m++;
    }
    else {
        for (j = i; j <= n; j++){
            swap((a+i), (a+j));
            calculate(a, i+1, n);
            swap((a+i), (a+j));
        }
    }
}
```

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

```
#include<stdio.h>
#include<string.h>

void calculate(char *a, int i, int n);
void swap (char *x, char *y);
int m = 0;
void main()
{
    char str[10] = "India" ;
    int len=0;
    len = strlen(str);
    calculate(str, 0, len-1);
    printf("%d\n",m);

}

void swap (char *x, char *y) {
    char temp;
    temp = *x;
    *x = *y;
    *y = temp;
}

void calculate(char *a, int i, int n) {
    int j=0;
    if (i == n){
        m++;
    }
    else {
        for (j = i; j <= n; j++){
            swap((a+i), (a+j));
            calculate(a, i+1, n);
            swap((a+i), (a+j));
        }
    }
}
```

What will be the output of the following program? (1 mark)

```
#include<stdio.h>
void main()
{
    int b = 9093;
    int a = 0;
    while (b > 0) {
        a = a + (b % 10);
        b = b / 10;
    }
    printf("%d",a);
}
```

9. What will be the output of the following program? (1 mark)

```
#include<stdio.h>
void main()
{
    int a[3][4] = {2,4,6,8,10,12,12,10,8,6,4,2};
    int i = 0, j, k = 13;
    while(i<3)
    {
        for(j=0;j<4;j++)
        {
            if(a[i][j]>k)
            {
                k=a[i][j];
            }
        }
        i++;
    }
    printf("%d",k);
}
```

10. What will be the output of the following program? (1 mark)

```
#include <stdio.h>
#include <string.h>
struct test
{
    char s[10];
}t;
void func (struct test t)
{
    strcpy(t.s, "Chennai");
}
void main (void)
{
    strcpy(t.s, "Zoho");
    printf("%s ", t.s);
    func(t);
    printf("%s ", t.s);
}
```

4. What is the output of the method for the following program? (1 mark)

```
#include <stdio.h>
void main(){
    int n;
    for (n = 5; n != 0 ; n--){
        printf("%d ", n);
    }
}
```

5. What will be the output of the following program? (1 mark)

```
#include<stdio.h>
void main() {
    int c[]={1,2,3,4};
    int j,*q=c;
    for(j=0;j<4;j++){
        printf("%d ", *c);
        ++q;
    }
}
```

6. What will be the output of the following program? (1 mark)

```
#include<stdio.h>
int a[]={2,4,6};
int* f(void)
{
    int i;
    for(i=0;i<3;i++)
        return a+1;

}
void main(void){
    *f()=12;
    printf("%d %d %d ",a[0],a[1],a[2]);
}
```

7. What will be the output of the following program? (1 mark)

```
#include <stdio.h>
#include <stdlib.h>
void main (void)

{
    int *a, i;
    a = (int *) malloc ( 5 * sizeof(int));
    for (i=0; i<5; i++)
        *(a + i) = i * i;
```

**INSTITUTE OF ROAD AND TRANSPORT TECHNOLOGY : ERODE - 638316.**

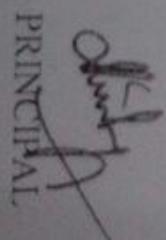
Dr.K.MAYILSAMY  
PRINCIPAL

**CIRCULAR**

Ref: IRTT/EC/NDI/7/1  
Date: 12.07.2017

FILE NO.  
The list of calculators allowed for the semester exams are given below. Students are instructed to use only the calculators permitted in the list during subject classes and in the University exams for the subject concerned. Usage of other calculators not in the list below during University Examination is considered as malpractice.

1. CASIO FX-991 MS
2. TI-30 X-II S
3. TI-30XS-Multiview
4. Caltex CX-991S
5. Caltex CX82MS
6. CASIO FX-991 ES (Not Permitted for Numerical Methods Subject)
7. TI-36X-II (Not Permitted for Numerical Methods Subject)
8. TI-36X-Pro (Not Permitted for Numerical Methods Subject)

  
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11. What will be the output of the following program? (2 marks)

```
#include <stdio.h>
#include <string.h>
void main(){
    int table[2][4];
    int m = 5, n = 1, x = 3, i = 0, j = 0, k = 0;
    memset(table, 0, sizeof(table)); //Initialize all entries as 0
    for (i = 1; i <= m && j <= x; j++) {
        table[i][j] = 2;
    }
    for (i = 2; i <= n; i++) {
        for (j = 1; j <= x; j++) {
            for (k = 1; (k <= m && k < i); k++) {
                table[i][j] += table[i-1][j-k];
            }
        }
    }
    printf("%d\n", table[n][x]);
}
```

12. What will be the output of the following program? (2 marks)

```
#include <stdio.h>
int find(int j)
{
    if(j>1)
    {
        j=find(j/10)-(j%10);
        printf("%d \t",j);
    }
    else {
        j=0;
    }
    return j;
}
```

d main()

```
int i=7547;
int k;
k=find(i);
```

8. What will be the output of the following program? (1 mark)

```
#include<stdio.h>
void main()
{
    int b = 9093;
    int a = 0;
    while (b > 0) {
        a = a + (b % 10);
        b = b / 10;
    }
    printf("%d",a);
}
```

9. What will be the output of the following program? (1 mark)

```
#include<stdio.h>
void main()
{
    int a[3][4] = {2,4,6,8,10,12,12,10,8,6,4,2};
    int i = 0, j, k = 13;
    while(i<3)
    {
        for(j=0;j<4;j++)
        {
            if(a[i][j]>k)
            {
                k=a[i][j];
            }
        }
        i++;
    }
    printf("%d",k);
}
```

10. What will be the output of the following program? (1 mark)

```
#include <stdio.h>
#include <string.h>
struct test
{
    char s[10];
}t;
void func (struct test t)
{
    strcpy(t.s, "Chennai");
}
void main (void)
{
    strcpy(t.s, "Zoho");
    printf("%s ", t.s);
    func(t);
    printf("%s ", t.s);
}
```

11. What will be the output of the following program? (2 marks)

```
#include<stdio.h>
#include <string.h>
void main(){
    int table[2][4];
    int m = 5, n = 1, x = 3, i = 0, j = 0, k = 0;
    memset(table, 0, sizeof(table)); //Initialize all entries as 0
    for (j = 1; j <= m && j <= x; j++) {
        table[1][j] = 2;
    }
    for (i = 2; i <= n; i++) {
        for (j = 1; j <= x; j++) {
            for (k = 1; (k <= m && k < j); k++) {
                table[i][j] += table[i-1][j-k];
            }
        }
    }
    printf("%d\n", table[n][x]);
}
```

12. What will be the output of the following program? (2 marks)

```
#include <stdio.h>
int find(int j)
{
    if(j>1)
    {
        j=find(j/10)-(j%10);
        printf("%d \t",j);
    }
    else {
        j=0;
    }
    return j;
}

void main()
{
    int i=7547;
    int k;
    k=find(i);
}
```

```

#include<string.h>
int main()
{
    int nf,i,j,c,m;
    char str[]={"Zoho Corporation - Chennai"};
    int length = strlen(str);
    i=0,m=0,c=0;

    while(str[i]!='\0' && i <= length)
    {
        j=i;
        c=0;
        while((str[j]!=' ')&&(str[j]!='\0')){
            j++;
        }
        i=j+1;
        while(~j && str[j] != ' ')
        {
            if ( str[j] == 'o'){
                c++;
            }
        }
        if ( m < c ) m = c;
    }
    printf("%d \n", m);
}

```

14. What will be the output of the following program? (2 marks)

```

#include<stdio.h>
void main()
{
    int arr[] = {-3,1,2,3,2,-3,2};
    int i,j, k=1,s=6;
    for(i=1;i<s;i++)
    {
        for(j=0;j<k;j++)
        {
            if(arr[i] == arr[j])
                break;
        }
        if(j==k)
            arr[k++] = arr[i];
    }
    for(i=0;i < k;i++)
        printf("%d ",arr[i]);
}

```

```
clude <stdio.h>
lude <string.h>
t main(){
    int table[2][4];
    int m = 5, n = 1, x = 3, i = 0, j = 0, k = 0;
    memset(table, 0, sizeof(table)); //Initialize all elements of table to 0
    for (j = 1; j <= m && j <= x; j++) {
        table[1][j] = 2;
    }
    for (i = 2; i <= n; i++) {
        for (j = 1; j <= x; j++) {
            for (k = 1; (k <= m && k < j); k++) {
                table[i][j] += table[i-1][k];
            }
        }
    }
    printf("%d\n", table[n][x]);
}
```

will be the output of the following program?

```
#include <stdio.h>
#include <string.h>
t main0{
    int table[2][4];
    int m = 5, n = 1, x = 3, i = 0, j = 0, k = 0;
    memset(table, 0, sizeof(table)); //Initialize all elements of table to 0
    for (j = 1; j <= m && j <= x; j++) {
        table[1][j] = 2;
    }
    for (i = 2; i <= n; i++) {
        for (j = 1; j <= x; j++) {
            for (k = 1; (k <= m && k < j); k++) {
                table[i][j] += table[i-1][k];
            }
        }
    }
    printf("%d\n",table[n][x]);
```

will be the output of the following program?

4. What is the output of the method for the following program? (1 mark)

```
#include <stdio.h>
void main(){
    int n;
    for (n = 5; n != 0 ; n--){
        printf("%d ", n);
    }
}
```

5. What will be the output of the following program? (1 mark)

```
#include<stdio.h>
void main() {
    int c[]={1,2,3,4};
    int j,*q=c;
    for(j=0;j<4;j++){
        printf("%d ", *c);
        ++q;
    }
}
```

6. What will be the output of the following program? (1 mark)

```
#include<stdio.h>
int a[]={2,4,6};
int* f(void)
{
    int i;
    for(i=0;i<3;i++)
        return a+1;

}
void main(void){
    *f()=12;
    printf("%d %d %d ",a[0],a[1],a[2]);
}
```

7. What will be the output of the following program? (1 mark)

```
#include <stdio.h>
#include <stdlib.h>
void main (void)

{
    int *a, i;
    a = (int *) malloc ( 5 * sizeof(int));
    for (i=0; i<5; i++)
        *(a + i) = i * i;
```

4. What will be the output of the following program? (1 mark)

```
#include<stdio.h>
void main()
{
    int n;
    for (n=0; n<6; n++)
        printf("%d ", n);
}
```

5. What will be the output of the following program? (1 mark)

```
#include<stdio.h>
void main()
{
    int c[]={1,2,3,4};
    int j,*q=c;
    for(j=0;j<4;j++){
        printf("%d ",*c);
        ++q;
    }
}
```

6. What will be the output of the following program? (1 mark)

```
#include<stdio.h>
int a[]={2,4,6};
int* f(void)
{
    int i;
    for(i=0;i<3;i++)
        return a+i;
}
void main(void){
    *f()=12;
    printf("%d %d %d ",a[0],a[1],a[2]);
}
```

What will be the output of the following program? (1 mark)

```
#include <stdio.h>
#include <stdlib.h>
main (void)

    int *a, i;
    a = (int *) malloc ( 5 * sizeof(int));
    for (i=0; i<5; i++)
        *a++ = i; *
```

4. What is the output of the method for the following program? (1 mark)

```
#include <stdio.h>
void main(){
    int n;
    for (n = 5; n != 0 ; n--){
        printf("%d ,", n);
    }
}
```

5. What will be the output of the following program? (1 mark)

```
#include<stdio.h>
void main() {
    int c[]={1,2,3,4};
    int j,*q=c;
    for(j=0;j<4;j++){
        printf("%d ",*c);
        ++q;
    }
}
```

6. What will be the output of the following program? (1 mark)

```
#include<stdio.h>
int a[]={2,4,6};
int* f(void)
{
    int i;
    for(i=0;i<3;i++)
        return a+1;
}
void main(void){
    *f()=12;
    printf("%d %d %d ",a[0],a[1],a[2]);
}
```

7. What will be the output of the following program? (1 mark)

```
#include <stdio.h>
#include <stdlib.h>
void main (void)
{
    int *a, i;
    a = (int *) malloc ( 5 * sizeof(int));
    for (i=0; i<5; i++)
        *(a + i) = i * i;
    for (i=0; i<5; i++)
        printf("%d ", *a++);
    free(a);
}
```

4. What is the output of the method for the following program? (1 mark)

```
#include <stdio.h>
void main(){
    int n;
    for (n = 5; n != 0 ; n--){
        printf("%d ,", n);
    }
}
```

5. What will be the output of the following program? (1 mark)

```
#include<stdio.h>
void main() {
    int c[]={1,2,3,4};
    int j,*q=c;
    for(j=0;j<4;j++){
        printf("%d ",*c);
        ++q;
    }
}
```

6. What will be the output of the following program? (1 mark)

```
#include<stdio.h>
int a[]={2,4,6};
int* f(void)
{
    int i;
    for(i=0;i<3;i++)
        return a+1;
}
void main(void){
    *f()=12;
    printf("%d %d %d ",a[0],a[1],a[2]);
}
```

7. What will be the output of the following program? (1 mark)

```
#include <stdio.h>
#include <stdlib.h>
void main (void)
{
    int *a, i;
    a = (int *) malloc ( 5 * sizeof(int));
    for (i=0; i<5; i++)
        *(a + i) = i * i;
    for (i=0; i<5; i++)
        printf("%d ", *a++);
    free(a);
}
```

8. What will be the output of the following program? (1 mark)

```
#include<stdio.h>
void main()
{
    int b = 9093;
    int a = 0;
    while (b > 0) {
        a = a + (b % 10);
        b = b / 10;
    }
    printf("%d",a);
}
```

9. What will be the output of the following program? (1 mark)

```
#include<stdio.h>
void main()
{
    int a[3][4] = {2,4,6,8,10,12,12,10,8,6,4,2};
    int i = 0, j, k = 13;
    while(i<3)
    {
        for(j=0;j<4;j++)
        {
            if(a[i][j]>k)
            {
                k=a[i][j];
            }
        }
        i++;
    }
    printf("%d",k);
}
```

10. What will be the output of the following program? (1 mark)

```
#include <stdio.h>
#include <string.h>
struct test
{
    char s[10];
}t;
void func (struct test t)
{
    strcpy(t.s, "Chennai");
}
void main (void)
{
    strcpy(t.s, "Zoho");
    printf("%s ", t.s);
    func(t);
    printf("%s ", t.s);
}
```

11. What will be the output of the following program? (2 marks)

```
#include<stdio.h>
#include <string.h>
void main(){
    int table[2][4];
    int m = 5, n = 1, x = 3, i = 0, j = 0, k = 0;
    memset(table, 0, sizeof(table)); //Initialize all entries as 0
    for (j = 1; j <= m && j <= x; j++) {
        table[1][j] = 2;
    }
    for (i = 2; i <= n; i++) {
        for (j = 1; j <= x; j++) {
            for (k = 1; (k <= m && k < j); k++) {
                table[i][j] += table[i-1][j-k];
            }
        }
    }
    printf("%d\n", table[n][x]);
}
```

12. What will be the output of the following program? (2 marks)

```
#include <stdio.h>
int find(int j)
{
    if(j>1)
    {
        j=find(j/10)-(j%10);
        printf("%d \t",j);
    }
    else {
        j=0;
    }
    return j;
}

void main()
{
    int i=7547;
    int k;
    k=find(i);
}
```

**Section A - Programming**

1. What will be the output of the following program? (1 mark)

```
#include <stdio.h>
void main(){
    int i=0,j=0,sum = 0;
    for(i=1; i<800; i*=3)
        for(j=0; j<i;j++)
            sum++;
    printf("%d",sum);
}
```

2. What will be the output of the following program? (1 mark)

```
#include<stdio.h>
int max(int x, int y){
    return (y > x)? y : x;
}
void main(){
    int a[] = {-6, -3, 8, -1, -2, 1, 5, -3};
    int z = a[0], n=8, i=0,c=a[0];
    for (i = 1; i < n; i++) {
        c = max(a[i], c+a[i]);
        z = max(z, c);
    }
    printf("%d \n", z);
}
```

3. What will be the output of the following program? (1 mark)

```
#include <stdio.h>
void main(){
    int s[] = {9, 7, 5, 3, 1, 0};
    int f[] = {2, 4, 6, 8, 10, 12};
    int n = 6,i=0,j=1;
    for (j = 1; j < n; j++) {
        if (s[j] >= f[i]) {
            printf( "%d ", i);
            i = j;
        }
    }
}
```

**Section A - Programming**

1. What will be the output of the following program? (1 mark)

```
#include <stdio.h>
void main(){
    int i=0,j=0,sum = 0;
    for(i=1; i<800; i*=3)
        for(j=0; j<i;j++)
            sum++;
    printf("%d",sum);
}
```

2. What will be the output of the following program? (1 mark)

```
#include<stdio.h>
int max(int x, int y){
    return (y > x)? y : x;
}
void main(){
    int a[] = {-6, -3, 8, -1, -2, 1, 5, -3};
    int z = a[0], n=8, i=0,c=a[0];
    for (i = 1; i < n; i++) {
        c = max(a[i], c+a[i]);
        z = max(z, c);
    }
    printf("%d \n", z);
}
```

3. What will be the output of the following program? (1 mark)

```
#include <stdio.h>
void main(){
    int s[] = {9, 7, 5, 3, 1, 0};
    int f[] = {2, 4, 6, 8, 10, 12};
    int n = 6,i=0,j=1;
    for (j = 1; j < n; j++) {
        if (s[j] >= f[i]) {
            printf( "%d ", i);
            i = j;
        }
    }
}
```

4. What will be the output of the following program? (1 mark)

```
#include<stdio.h>
void main()
{
    int n;
    for (n=0; n<6; n++)
        printf("%d ", n);
}
```

5. What will be the output of the following program? (1 mark)

```
#include<stdio.h>
void main()
{
    int c[] = {1,2,3,4};
    int j,*q=c;
    for(j=0;j<4;j++)
        printf("%d ", *q);
    ++q;
}
```

6. What will be the output of the following program? (1 mark)

```
#include<stdio.h>
int a[]={2,4,6};
int* f(void)
{
    int i;
    for(i=0;i<3;i++)
        return a+i;
}
void main(void){
    *f()=12;
    printf("%d %d %d ",a[0],a[1],a[2]);
}
```

What will be the output of the following program? (1 mark)

```
#include <stdio.h>
#include <stdlib.h>
main (void)

    int *a, i;
    a = (int *) malloc ( 5 * sizeof(int));
    for (i=0; i<5; i++)
        *a++ = i; /* ... */
```

```

#include<string.h>
int main()
{
    int nf,i,j,c,m;
    char str[]={"Zoho Corporation - Chennai"};
    int length = strlen(str);
    i=0,m=0,c=0;

    while(str[i]!='\0' && i <= length)
    {
        j=i;
        c=0;
        while((str[j]!=' ')&&(str[j]!='\0')){
            j++;
        }
        i=j+1;
        while(~j && str[j] != ' ')
        {
            if ( str[j] == 'o'){
                c++;
            }
        }
        if ( m < c ) m = c;
    }
    printf("%d \n", m);
}

```

14. What will be the output of the following program? (2 marks)

```

#include<stdio.h>
void main()
{
    int arr[] = {-3,1,2,3,2,-3,2};
    int i,j, k=1,s=6;
    for(i=1;i<s;i++)
    {
        for(j=0;j<k;j++)
        {
            if(arr[i] == arr[j])
                break;
        }
        if(j==k)
            arr[k++] = arr[i];
    }
    for(i=0;i < k;i++)
        printf("%d ", arr[i]);
}

```

What will be the output of the following program? (1 mark)

```
#include<stdio.h>
void main()
{
    int b = 9093;
    int a = 0;
    while (b > 0) {
        a = a + (b % 10);
        b = b / 10;
    }
    printf("%d",a);
}
```

9. What will be the output of the following program? (1 mark)

```
#include<stdio.h>
void main()
{
    int a[3][4] = {2,4,6,8,10,12,12,10,8,6,4,2};
    int i = 0, j, k = 13;
    while(i<3)
    {
        for(j=0;j<4;j++)
        {
            if(a[i][j]>k)
            {
                k=a[i][j];
            }
        }
        i++;
    }
    printf("%d",k);
}
```

10. What will be the output of the following program? (1 mark)

```
#include <stdio.h>
#include <string.h>
struct test
{
    char s[10];
}t;
void func (struct test t)
{
    strcpy(t.s, "Chennai");
}
void main (void)
{
    strcpy(t.s, "Zoho");
    printf("%s ", t.s);
    func(t);
    printf("%s ", t.s);
}
```

12) What will be the output of the following program?

```
#include<stdio.h>
#include<string.h>
int m = 0;
void main() {
    char str[10] = "Zoho";
    int len=0, i=0;
    len = strlen(str);
    calculate(str, 0, len-1);
    printf("%d\n", m);
}
void swap (char *x, char *y) {
    char temp;
    temp = *x;
    *x = *y;
    *y = temp;
}
void calculate(char *a, int i, int n) {
    int j=0;
    if(i == n) {
        m++;
    }
    else {
        for(j = i; j <= n; j++) {
            swap((a+i), (a+j));
            calculate(a, i+1, n);
            swap((a+i), (a+j));
        }
    }
}
```

**Section B - Aptitude**

10 questions | 45 minutes

Each question carries one mark

- 1) While visiting a small town in the United States, I lost my overcoat in a bus. While I reported the matter to the bus company I was asked the number of the bus. Though I did not remember the exact number I remember that the bus number had a certain peculiarity about it. The number plate showed that the bus number was a perfect square and also if the plate was turned upside down, the number would still be a perfect square. I also came to know from the bus company they had buses numbered from 1 to 500. From this I was able to deduce the bus number. Could you tell what the number was?
- 2) In an entrance test, a candidate's point were wrongly taken as 42 instead of 24. Because of that, the average score for the exam got increased by  $\frac{3}{4}$ . Find the number of candidates who have attended the exam.
- 3) Some months back this year I was walking through a park. I saw an intelligent looking little boy playing all by himself and decided to talk to him. Just to start the conversation I asked him how old he was. With a mischievous glint in his eye, he replied, "Two days back I was ten years old and next year I shall be thirteen. If you know what day is today you'll be able to figure out my birthday and that will give you my age." This left me bewildered. Help me find out the boy's age.
- 4) A watch which gains 5 seconds in 3 minutes was set right at 7 a.m. In the afternoon of the same day, when the watch indicated quarter past 4 o'clock, the true time is:
- 5) Find the 50th term of the series 2, 12, 36, 80, ....
- 6) There is game which lasts for ninety minutes which is played only with 8 players. There are 4 reserve players. These 4 reserve players alternate equally with each player. This means that all players, including the reserves, are on the pitch for exactly the same length of time. For how long is each player on the pitch?
- 7) Fresh fruits contains 64% of water and dry fruit contains 25% of water. How much dry fruit from 100 kg of fresh fruit can be obtained?
- 8) The product of 3 consecutive numbers when divided by each of them in turn, the sum of the quotients will be 74. What are the numbers?
- 9) The son of a rich bullion merchant left home on the death of his father. All he had with him was a chain that consisted of 138 links. He rented a place in the city center with a shop at the lower level and an apartment at the upper level. He was required to pay every week one link of the gold chain as rent for the place.
- The landlady told him that she wanted one link of the gold chain at the end of one week, two at the end of two weeks, three gold links at the end of three weeks and so on.
- The son realized that he had to cut the links of the gold chain to pay the weekly rent. If the son had to rent the place for 138 weeks, what would be the minimum number of links he would need to cut?
- 10) It was vacation time, and so I decided to visit my cousin's home. What a grand time we had in the mornings, we both would go for a jog. The evenings were spent on the tennis court. Tennis activities were, we could manage only one per day, i.e., either we went for a jog or play tennis. There were days when we felt lazy and stayed home all day long. In 13 evenings when we stayed at my cousin's home, we managed to play tennis 13 evenings when we stayed at my cousin's home.

- 1) What is the output of the following program?

```
#include <stdio.h>
void main()
{
    static int a[] = { 0,1,2,3,4 };
    static int *p[] = { a,a+1,a+2,a+3,a+4 };
    Int **ptr = p;
    ptr++;
    printf("%d %d %d \n", ptr-p, *ptr-a, **ptr);
    *ptr++;
    printf("%d %d %d \n", ptr-p, *ptr-a, **ptr);
    ++ptr;
    printf("%d %d %d \n", ptr-p, *ptr-a, **ptr);
    ++ptr;
    printf("%d %d %d \n", ptr-p, *ptr-a, **ptr);
}
```

- 2) What will be the output of the following program?

```
#include<stdio.h>
int f(int x, int *py, int **ppz)
{
    int y, z;
    **ppz += 1;
    z = **ppz;
    *py += 2;
    y = *py;
    x += 3;
    return x + y + z;
}
void main()
{
    int c, *b, **a;
    c = 5;
    b = &c;
    a = &b;
    printf("%d ", f(c, b, a));
    return 0;
}
```

```
{  
    int n = 897;  
    n = getValue(n);  
    printf("%d \n", n );  
    return 0;  
}
```

14) What is the output of the following program?

```
#include <stdio.h>  
int x=2, y=4, z=5, w=3, xcount=0;  
void p(int z,int *x) {  
    *x= 3*z - *x;  
    int w=*x+z;  
    if(*x<=y) {  
        p(*x+1,&w);  
        ++xcount;  
    }  
}  
int main(void) {  
    p(1,&x);  
    printf("%d %d %d %d \n",x,z,w,xcount);  
    return 0;  
}
```

**SECTION B - Aptitude**

10 questions | 45 minutes

Each question carries one mark.

- 1) While visiting a small town in the United States, I lost my overcoat in a bus. While I reported the matter to the bus company I was asked the number of the bus. Though I did not remember the exact number I remember that the bus number had a certain peculiarity about it. The number plate showed that the bus number was a perfect square and also if the plate was turned upside down, the number would still be a perfect square. I also came to know from the bus company they had buses numbered from 1 to 60. From this I was able to deduce the bus number. Could you tell what the number was?
- 2) In an entrance test, a candidate's point were wrongly taken as 42 instead of 24. Because of this, the average score for the exam got increased by  $\frac{3}{4}$ . Find the number of candidates who took the exam.
- 3) Some months back this year I was walking through a park. I saw an intelligent looking little boy all by himself and decided to talk to him. Just to start the conversation I asked him how old he is. With a mischievous glint in his eye, he replied, "Two days back I was ten years old and next year I will be thirteen. If you know what day is today you'll be able to figure out my birthday and that we are." This left me bewildered. Help me find out the boy's age.
- 4) A watch which gains 5 seconds in 3 minutes was set right at 7 a.m. In the afternoon of the same day the watch indicated quarter past 4 o'clock, the true time is:
- 5) Find the 50th term of the series 2, 12, 36, 80, ...
- 6) There is a game which lasts for ninety minutes which is played only with 8 players. The players, including the reserves, are on the pitch for exactly the same length of time. How many players on the pitch?
- Fresh fruits contain 64% of water and dry fruit contains 25% of water. How much of fresh fruit can be obtained?
- The product of 3 consecutive numbers when divided by each of them in turn will be 74. What are the numbers?
- The son of a rich bullion merchant left home on the death of his father. He had a gold chain in that consisted of 138 links. He rented a place in the city center with an apartment at the upper level. He was required to pay every week rent for the place.
- A lady told him that she wanted one link of the gold chain at the end of two weeks, three gold links at the end of three weeks and so on. When he realized that he had to cut the links of the gold chain to pay the rent at the place for 138 weeks, what would be the minimum number of links he would have to cut?

To visit my cousin's house

**Section B - Aptitude**

10 questions | 45 minutes

Each question carries one mark

- 1) While visiting a small town in the United States, I lost my overcoat in a bus. While I reported the matter to the bus company I was asked the number of the bus. Though I did not remember the exact number I remember that the bus number had a certain peculiarity about it. The number plate showed that the bus number was a perfect square and also if the plate was turned upside down, the number would still be a perfect square. I also came to know from the bus company they had buses numbered from 1 to 500. From this I was able to deduce the bus number. Could you tell what the number was?
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- 4) A watch which gains 5 seconds in 3 minutes was set right at 7 a.m. In the afternoon of the same day, when the watch indicated quarter past 4 o'clock, the true time is:
- 5) Find the 50th term of the series 2, 12, 36, 80, ....
- 6) There is game which lasts for ninety minutes which is played only with 8 players. There are 4 reserve players. These 4 reserve players alternate equally with each player. This means that all players, including the reserves, are on the pitch for exactly the same length of time. For how long is each player on the pitch?
- 7) Fresh fruits contains 64% of water and dry fruit contains 25% of water. How much dry fruit from 100 kg of fresh fruit can be obtained?
- 8) The product of 3 consecutive numbers when divided by each of them in turn, the sum of the quotients will be 74. What are the numbers?
- 9) The son of a rich bullion merchant left home on the death of his father. All he had with him was a chain that consisted of 138 links. He rented a place in the city center with a shop at the lower level and an apartment at the upper level. He was required to pay every week one link of the gold chain as rent for the place.
- The landlady told him that she wanted one link of the gold chain at the end of one week, two at the end of two weeks, three gold links at the end of three weeks and so on.
- The son realized that he had to cut the links of the gold chain to pay the weekly rent. If the son had to rent the place for 138 weeks, what would be the minimum number of links he would need to cut?
- 10) It was vacation time, and so I decided to visit my cousin's home. What a grand time we had in the mornings, we both would go for a jog. The evenings were spent on the tennis court. Tennis activities were, we could manage only one per day, i.e., either we went for a jog or play tennis. There were days when we felt lazy and stayed home all day long. In 13 evenings when we stayed at my cousin's home, we managed to play tennis 13 evenings when we stayed at my cousin's home.

**Section B - Aptitude**

10 questions 45 minutes

Each question carries one mark

- 1) While visiting a small town in the United States, I lost my overcoat in a bus. While I reported the matter to the bus company I was asked the number of the bus. Though I did not remember the exact number, I remember that the bus number had a certain peculiarity about it. The number plate showed that the bus number was a perfect square and also if the plate was turned upside down, the number would still be a perfect square. I also came to know from the bus company they had buses numbered from 1 to 500. From this I was able to deduce the bus number. Could you tell what the number was?
- 2) In an entrance test, a candidate's point were wrongly taken as 42 instead of 24. Because of that, the average score for the exam got increased by  $\frac{3}{4}$ . Find the number of candidates who have attended the exam.
- 3) Some months back this year I was walking through a park. I saw an intelligent looking little boy playing all by himself and decided to talk to him. Just to start the conversation I asked him how old he was. A mischievous glint in his eye, he replied, "Two days back I was ten years old and next year I shall be thirteen. If you know what day is today you'll be able to figure out my birthday and that will give you a hint." This left me bewildered. Help me find out the boy's age.
- 4) A watch which gains 5 seconds in 3 minutes was set right at 7 a.m. In the afternoon of the same day, when the watch indicated quarter past 4 o'clock, the true time is:
- 5) Find the 50th term of the series 2, 12, 36, 80, ....
- 6) There is a game which lasts for ninety minutes which is played only with 8 players. There are 4 players. These 4 reserve players alternate equally with each player. This means that all 8 players, including the reserves, are on the pitch for exactly the same length of time. For how many minutes does each player on the pitch?
- 7) Fresh fruits contains 64% of water and dry fruit contains 25% of water. How much dry fruit can be obtained from 1 kg of fresh fruit?
- 8) The product of 3 consecutive numbers when divided by each of them in turn, the sum will be 74. What are the numbers?
- 9) The son of a rich bullion merchant left home on the death of his father. All he had was a gold chain that consisted of 138 links. He rented a place in the city center with a shop at the end of two weeks, three gold links at the end of three weeks and so on. The landlady told him that she wanted one link of the gold chain at the end of one week, two links at the end of two weeks, three gold links at the end of three weeks and so on. What is the minimum number of links he had to cut the links of the gold chain to pay the weekly rent?

The landlady told him that she wanted one link of the gold chain at the end of one week, two links at the end of two weeks, three gold links at the end of three weeks and so on. What is the minimum number of links he had to cut the links of the gold chain to pay the weekly rent?

1.3) What is the output of the following program?

```
#include <stdio.h>
int getValue(int x) {
    int y = 0;
    if(x / 10 == 0)
        return x;
    else {
        while(x > 1) {
            y = y + x % 10;
            x = x / 10;
        }
        if(y / 10 != 0) {
            y = getValue(y);
        }
    }
    return y;
}
int main()
{
    int n = 897;
    n = getValue(n);
    printf("%d \n", n );
    return 0;
}
```



14) What is the output of the following program?

```
#include <stdio.h>
int x=2, y=4, z=5, w=3, xcount=0;
void p(int z,int *x) {
    *x= 3*z - *x;
    int w=*x+z;
    if(*x<=y) {
        p(*x+1,&w);
        ++xcount;
    }
}
```

```
#include <stdio.h>
int getValue(int x) {
    int y = 0;
    if(x / 10 == 0)
        return x;
    else {
        while(x > 1) {
            y = y + x % 10;
            x = x / 10;
        }
        if( y / 10 != 0) {
            y = getValue(y);
        }
    }
    return y;
}
int main( )
{
    int n = 897;
    n = getValue(n);
    printf("%d \n", n );
    return 0;
}
```

4) What is the output

What is the output of the following program?

```
#include <stdio.h>
#include <string.h>
void concat(char *p,char *q);
int main() {
    char *x = "ZohoCorp";
    char *y = "ManageEngine";
    concat(x,y);
    return 0;
}
void concat(char *p,char *q) {
    int i,j,k=0,temp=0;
    char c[50];
    for(j=0; j<strlen(p); j++) {
        c[k++]=p[j];
        temp++;
        for(i=j+1; q[i]!='\0',i<=j+temp; i++) {
            c[k++]=q[i];
        }
        j=k-1;
    }
    c[k]='\0';
    printf("%s",c);
}
```

3) What will be the output of the following program?

```
#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("%d\n", maxsum);
}
```

4) What will be the output of the following program?

```
#include <stdio.h>
void main() {
    int i=0,j,k,n=4;
    while(i++ < n) {
        if(i%2 == 1)
            k = 1;
        else
            k = 0;
        for(j=1; j<=i; j++, k+=1) {
            printf("%d ", k)
        }
        printf("\n");
    }
}
```

- 1) The Average weight of the A and B is 36, and average weight of A, B and C is 20, then what is the weight of the C?
- 2) A Contractor employed a certain number of workers to finish constructing a road in a certain estimated time. Sometime later, when a part of work had been completed, he realized that the work would get delayed by three-fourth of the scheduled time, so he at once doubled the no. of workers and thus he managed to finish the road on the scheduled time. How much work he had been completed before increasing the number of workers?
- 3) A toy was sold at a loss of 17%. It was observed that if the selling price was Rs. 300 more, then the profit made would have been 60%. What is the actual selling price of the toy?
- 4) Find the single discount equivalent to successive discount of 20%, 10% and 5%.
- 5) A, B, C and D are four consecutive numbers which are divisible by 4, and their average is 42. Then what is the product of B and D?
- 6) One-year payment to the servant is Rs. 200 plus one shirt. The servant leaves after 2 months and receives Rs. 120 and a shirt. Then find the price of the shirt.
- 7) At a party, everyone shook hands with everybody else. There were 120 handshakes. How many people were at the party?
- 8) A red light flashes 3 times per minute and a green light flashes 5 times in two minutes. If regular intervals, if both lights start flashing at the same time, how many times do they flash together in each hour?
- 9) A tank can be filled by pipe A in 30 minutes & by pipe B in 24 minutes. Outlet pipe C can empty the full tank in 1 hour & 20 minutes. If the tank is empty initially and if all the 3 pipes A, B & C are opened simultaneously, in how much time will the tank be full?