1. What is IPO cycle? 

2. What are the key features of 2\textsuperscript{nd} generation computers? 

3. What are utilities? Give an example. 

4. What do you mean by shareware? 

5. Differentiate Real-time OS and Timesharing OS? 

6. Explain the terms: (i) Fire wire port (ii) Instruction set of a processor 

7. Convert:
   i. \((4D5.8)_{16} = (\_\_\_)_{10}\)
   ii. \((2547.6)_{8} = (\_\_\_)_{2}\) 

8. What is the role of comments and indentation in a program? 

9. What is meant by source code and object code? 

10. Explain runtime errors with a suitable example. 

11. Define the terms: i) Guard Code ii) Bug 

12. Explain any two different types of program maintenance. 

13. What are escape sequences? 

14. Which among the following are valid identifiers?
   Char, val@2, _int, col sum, 3rd_num, Const, num_3, break 

15. Name the header files required to execute the following program:
    ```c
    void main()
    {
      char name[20];
      gets(name);
      int l = strlen(name);
      for(int i=0; i<l; ++i)
        if(isdigit(name[i]))
          { cout<<"No digits allowed"); exit(0); } 
        else name[i]=toupper(name[i]);
      puts(name);
    }
    ```
16. Determine the value of \( f \) if \( x=3 \) and \( y=4 \)
\[
f = x^4/5 + y/(8+8-x+5/8)
\]

17. Write the C++ expression for the following:
   i. \[
   \frac{-b+\sqrt{b^2-4ac}}{2a}
   \]
   ii. \( x \) is even

18. What will be the output of the following code?
   ```
   int a=10, b=8;
   if(a%2)
     {
       if ((a==9) || (b==a)) cout<<"Good";
       else cout<<"Better";
     }
   else cout<<"Best";
   ```

19. Rewrite the following using do-while construct:
   ```
   for(int c=0, d=2; c<=d; c+=2, d++)
     cout<<c*d;
   cout<<"Series over";
   ```

20. What will be the output of the following code?
   ```
   void main()
   {
     int x=6, y=8;
     int z=x-- + ++y;
     cout<<x<<' '<<y++<<endl;
     cout<<--x<<' '<<y;
   }
   ```

21. Explain the use of scope resolution operator with an example.

22. Rewrite the following code after correcting syntax errors. Underline the corrections made.
   ```
   #include <iostream.h>
   void main()
   {
     int first=35, second=25;
     manip(first;second);
     manip(second);
   }
   void manip(int val1,val2=30)
   {
     val1=val1-val2;
     cout<<val1,val2;
   }
   ```
23. Write the output of the following code:

a. 
```
#include <iostream.h>
#include <ctype.h>
void main()
{
    char SampleText[]="This$OUTPUT!";
    for(int i=0;SampleText[i]!="\0";i++)
    {
        if(!isalpha(SampleText[i]))
            SampleText[i]='#';
        else if(isupper(SampleText[i]))
            SampleText[i]=SampleText[i]+1;
        else
            SampleText[i]=SampleText[i+1];
    }
    cout<<SampleText;
}
```

b. 
```
#include<stdio.h>
void convert(int arr[],int size,int mid)
{
    for(int i=0; i<size; i++)
    {
        if(i<mid)arr[i]+=i;
        else arr[i]*=i;
    }
}

void show(int arr[],int size)
{
    for(int i=0; i<size; i++)
    {
        (i%2==0)? cout<<arr[i]<<' ':'cout<<arr[i]<<endl;
    }
}

void main()
{
    int scores[]={5,10,15,20,25,30};
    convert(scores,6,3);
    show(scores,6);
}
```

24. For the following C++ program, choose a possible output from options (i) to (iv) given below:
#include<iostream.h>
#include<cstdlib.h>
void main()
{
    randomize();
    int x=5,N;
    for(int i=1;i<=4;i++)
    {
        N=25+random(x);
        cout<<N<<':';
        x--;
    }
}


25. What is the use of #define preprocessor directive? Give example. (2)

26. Rewrite the following code after correcting syntax errors. Underline the corrections made.
    #include<iostream.h>
    struct MyBox
    {
        int Length,Breadth,Height=10;
    }
    void Dimension(MyBox M)
    {
        cout<<M.Length<<"x"<<M.Breadth<<"x";
        cout<<Height<<endl;
    }
    void main()
    {
        MyBox B1=(10,15,20),B2;
        B2={5,10,25};
        Dimension(B1);
        B1.Length++;
        B2=B1;
        Dimension(B2);
    }

27. Write a C++ program to sum the series 1+x^2+x^4+......up to n terms. [The value of x and the number of terms to be input by the user.] (3)

28. Write a C++ program to read a string and check if it is a palindrome. An appropriate message is to be displayed. (3)

29. Write a C++ program that takes an integer as input and finds the sum of its digits. [e.g. if the input is 1365 the output will be 1+3+6+5=15] (4)
30. Write a C++ program that takes an array as input and swaps every element at an even position with the next element. [e.g. if the input array is {1,0,2,8,3}, the output will be {0,1,8,2,3}]

31. Write a C++ program to read a 2-D array as input and count the number of values that end with the digit 3.

32. Write a C++ program to add two matrices. [e.g. if $A = \begin{bmatrix} 1 & 0 \\ 9 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & 8 \\ 7 & 3 \end{bmatrix}$ then $A+B = \begin{bmatrix} 3 & 8 \\ 16 & 5 \end{bmatrix}$]