1. Write Structure declaration for the following:
   (a) An array of 5 structures that store rollno, name and marks in 3 subjects for students.

   (b) A structure that includes two structure variables - distance and time. The distance includes two
       float type variables - feet and inches. The time includes three int type variables – hrs, mins and
       secs.

   (c) An Array to store 60 player names and their positions

2. What is function prototyping? Describe any three different styles of function prototyping using
   appropriate examples.

3. How does the amount of storage depend upon type and size of an array? Explain with the help of an
   example.

4. Write an equivalent switch case block for the following if – else block.

   char code;
   if (code == 'A')
       cout << "Accountant";
   else
       if (code == 'C' || code == 'G')
           cout << "Grade IV";
       else
           if (code == 'F')
               cout << "Financial Advisor";

5. Name the header files, to which the following built-in function belong to:
   a) clrscr()   (b) strcpy     (c) log        (d) toupper  (e) setw()  (f) putc

6. What are the purposes of following mathematical functions in C++?
   (i) fabs()    (ii) fmod()

7. Predict the outputs of the following code fragments:-

   (a) int calc(int u)
       { if (u%2==0)
           return u+10;
       else
           return u*2; }

   void pattern(char m, int b=2)
   {
     for(int cnt=0;cnt<b;cnt++)
cout<<calc(cnt)<<m; }

void main()
{
pattern('*');
pattern('#',4);
pattern('@',3);
}

(b) #include<stdio.h>
struct pixel { int c, r };
void display(pixel p)
{ cout<<"Col"<<p.c<<"Row"<<p.r<<endl; }
void main()
{ pixel x={40,50},y,z;
z=x;
x.c+=10;
y=z;
y.c+=10;
y.r+=20;
z.c=15;
display(x); display(y); display(z); }

c) int b[10];

for(int i=1;i<3;i++)
for(int j=1;j<3;j++)
{
    b[i]=4*i+j;
    cout<<"\n"<<b[i];
}

8.(a) Find out the errors by rewriting the corrected program and highlight the corrections.
include<stdio.h>
const int size 5;
void main()
{ int array[size];
    array={50,40,30,20,10};
    for(ctr=0;ctr<size;ctr++)
        cout>>array[ctr];
}

(b) #include<stdio.h>
void main()
{ struct Student
    { char stu_name[20];
        char stu_sex;
        int stu_age=17;
    } student;
    gets(stu_name);
    gets(stu_sex); }
#include<iostream.h>

void main() {
    int n1,n2;
    int sub(int m1, int m2)
    int result;
    cin>>n1
    cin>>n2;
    result=sub(n1);
}

float sub(int m1, int m2) {
    return m1-m2;
}

9. Explain the difference between call-by-value and call-by-reference method with the help of example.

10. What is a scope of a variable? How many scopes are there in C++? Explain them.

11. Write a program to concatenate two strings.

12. Write a short program that doubles every element of a matrix a[4][4].

13. Write a complete C++ program that uses a function called carea() to calculate area of a circle. The function carea() receives radius of float type and returns area of double type. The function main() gets a radius value from the user, calls, area(), and displays the result. The function carea() is local to main().

14. What is the role of a return statement in a function? What are global and local prototypes?

15. Create a structure called volume that uses three variables(length, width, height) of type distance(feet and inches) to model the volume of a room. Read the three dimensions of the room and calculate the volume it represents and print out the result. The volume should be in feet form i.e., you will have to convert each dimension in to feet and fractions of foot. For instance, the length 12 feet 6 inches will be 12.5 feet.

16. An array stores details of 25 students (rollno, name, marks in 3 subjects). Write a program to create such an array and print out a list of students who have failed in more than one subjects. Assume 40% as pass marks.

17. Write a program to call the following functions:
(i) display() to display a matrix of a size m X n.
(ii) times2() to double each number of the matrix of size m X n.
(iii) main() to read a matrix of size m X n and then to display original matrix and then the new matrix formed by doubling its elements.

18. Write a menu driven program to take a number from the user and test
   • If it is a palindrome or not
   • To print its factorial
   • If it is a Armstrong number or not
19. ) In the following program, find the correct possible output(s) from the options:

```c
void main( )
{ randomize( );
char City[ ][10]={"DEL", "CHN", "KOL", "BOM", "BNG"};
    int Fly;
    for(int l=0; l<City[Fly]<<
    ".": }
}
Outputs: (i) DEL : CHN : KOL:
(ii) CHN : KOL : CHN:
(iii) KOL : BOM : BNG:
(iv) KOL : CHN : KOL:
```

19. Convert the following-

(i) (97)$_{10}$ to binary
(ii) (63.25)$_{10}$ to binary
(iii) (110.01)$_{2}$ to decimal
(iv) (11101110101)$_{2}$ to hexadecimal
(v) (5B7D)$_{16}$ to binary
(vi) (5A9)$_{16}$ to decimal
(vii) (510)$_{10}$ to hexadecimal
(viii) (11001101110)$_{2}$ to octal
(ix) (5371)$_{8}$ to binary
(x) (5737)$_{8}$ to decimal
(xi) (257)$_{10}$ to octal

20. Find the eight bit two’s complement form of (-15)$_{10}$


22.