Different types of pattern in Short Questions:-

Q1. Rewrite the following C++ code after removing any/all syntactical errors with each correction underlined.

Note: Assume all required header files are already being included in the program.

(a)
```
#define Formula(a,b) = 2*a+b
void main()
{
float X=3.2;Y=4.1;
Z=Formula(X,Y); cout<<'Result='<<Z<<endl;
}
```

Ans:-

```
#define Formula(a,b) 2*a+b
void main()
{
float X=3.2 , Y=4.1;
float Z=Formula(X,Y);
cout<< "Result=" <<Z<<endl;
}
```

(b)
```
#Define float MaxSpeed=60.5;
void main()
{
int MySpeed char Alert='N' ;
cin»MySpeed;
if MySpeed>MaxSpeed Alert='Y' ;
cout<<Alert<<endline;
}
```

Ans:-

```
#define float MaxSpeed 60.5 ; //Error 1,2,3
void main()
{
int MySpeed ; //Error 4 char Alert='N';
cin>>MySpeed;
if (MySpeed>MaxSpeed) //Error 5
Alert='Y';
cout<<Alert<< endl; //Error 6
}
```

(c)
```
Typedef char[80] STR;
void main( )
{
 Txt STR;
 gets(Txt);
 cout<<Txt[0]<<'\t'<<Txt[2];
  cout<<Txt<<endline;
}
```

Ans:-

```
Typedef char[80] STR;
void main( )
```

```
{
  STR Txt;
  gets(Txt);
  cout<<Txt[0]<<"\t"<<Txt[2];
  cout<<Txt<<endl;
}
```

(d)
```
void main( )
{   struct STUDENT
    {
      char stu_name[20]; char stu_sex;
      int stu_age=17;
     }student; gets(stu_name); gets(stu_sex);
}
```

Ans:

```
#include<iostream.h>
#include<stdio.h> void main( )
{   struct STUDENT
    {   char stu_name[20]; char    stu_sex; int stu_age;
     //Initialization of variables inside a structure is not allowed.
     }student; gets(student.stu_name); cin>>student.stu_sex);

                  //A single character cannot be read using gets

}
```

Q2. Observe the following C++ code and write the name(s) of the header file(s), which will be essentially required to run it in a C++ compiler:

(a)
```
void main( )
  {
  char CH,STR[20];
  cin>>STR; CH=toupper(STR[0]);
 cout<<STR<<"start with"<<CH<<endl;
  }
```

A) iostream.h and ctype.h

(b)
```
void main( )
  {
    int Number;
     cin>>Number;
  if (abs(Number)= = Number);
      cout<<"Positive"<<endl;
  }
```

A) iostream.h, math.h

(c)
```
void main( )
    {
      char TEXT[ ]="SomeThing";
       cout<<"Remaining SMS Chars:"<<160-strlen(TEXT)<<endl;
     }
```

Ans: iostream.h (for cout)
string.h (for strlen( ));

Q3. Find the output of the following program:

(a)
```
#include <iostream.h>
#include <ctype.h>
void Encode (char Info [ ], int N) ;
void main ( )
{          char Memo [ ] = "Justnow" ; Encode (Memo, 2) ;
        cout<<Memo<<endl ;
}
void Encode (char Info [ ], int N)
{        for (int I = 0 ; Info[I] !='\0' ; 1++)
                        if (1%2= =0)
                Info[I] = Info[I] –N ; else if (islower(Info[I]))
                Info[I] = toupper(Info[I]) ;
        else
                Info[I] = Info[I] +N ;
}
```

Ans: **HuqTlOu**

(b)
```
#include <iostream.h>
#include <ctype.h>
void Secret (char Mig[ ], int N); void main ( )
{ char SMS[ ] = "rEPorTmE" ; Secret{SMS,2);
  cout<<SMS<<end1;
}
void Secret(char Msg[ ], int N)
{ for (int C=0; Msg[C] !=' \0' ;C++) if (C%2==0)
        Msg[C] = Msg[C]+N;
                else if (isupper(Msg[C]))
                        Msg[C] = tolower(Msg[C]);
    else
                        Msg[C] = Msg[C]-N;
}
```

Ans **teRmttoe**

(c)
```
#include <iostream.h>
#include <ctype.h>
void Encrypt(char T[])
{ for (int i=0;T[i]!='\0';i+=2)
                if (T[i]=='A' || T[i]=='E') T[i]='#';
    else if (islower(T[i]))
            T[i]=toupper(T[i]);
    else
            T[i]='@';
}
void main()
{   char Text[]="SaVE EartH";
//The two words in the string Textare separated by single space
   Encrypt(Text); cout<<Text<<endl;
}
```

Answer:

@a@E@E#rTH