CLASSWORK APPLICATIONS FOR SELECTIVE STRUCTURES 1

Q1. Write a C++ program to determine a given number is odd or even.

```
#include<iostream>
using namespace std;

int main(){
    int number;
    cout<<"enter a number: \n";
    cin>>number;
    if(number%2==0) {
        cout<<"The number is even!"<<endl;
    }
    else if(number%2==1)
    cout<<"The number is odd!"<<endl;

}
```

Q2. Write a C++ program that determines whether a given temperature is less than or greater than the room temperature (25°C). If it is exaclty equal to the room temperature, the program displays “the temperature is good!”. If it is less than rooom temperature, the program displays “increase the temperature”. If it is greater, the program displays “decrease the temperature”.

```
#include<iostream>
using namespace std;

int main(){
    int temp;
    cout<<"enter a temperature: \n";
    cin>>temp;
    if(temp==25) {
        cout<<"the temperature is good!"<<endl;
    }
    else if(temp>25)
    cout<<"decrease the temperature"<<endl;
    else cout<<"increase the temperature"<<endl;

}
```

Q3. Write the C++ program required to calculate y(t) from the equation

$$y(t)=\begin{cases} -4t^3+3 & t\le 0 \\ 4t^3+3 & 0<t<2 \\ 17.5t & t\ge 2 \end{cases}$$

for any values of t.

```
#include<iostream>
#include<cmath>
using namespace std;

int main(){
    double t;
    cout<<"enter t: \n";
    cin>>t;
    if(t<=0) {
        cout<<"y("<<t<<")="<<-4*t*t*t+3<<endl;
    }
    else if(0<t && t<2) cout<<"y("<<t<<")="<<4*pow(t,3)+3<<endl;
    else cout<<"y("<<t<<")="<<17.5*t<<endl;

}
```

Q4. In a mechanical engineering department, a student must enroll for three elective courses during the last term. The student must select three courses from following list of options:

```
ME 401 KIN. SYNTHESIS OF LINKAGE

ME 405 MECHANICAL VIBRATIONS

ME 407 ELEC.ACTUATIONS OF MECH.SYS.

ME 408 STRENGTH OF MATERIALS 2

ME 410 CENTRIFUGAL PUMP BLOWER
```

Construct a C++ p rogram that prompts the student for his or her choice, read in the choice, and use the answer as the case expression for a switch construct. Be sure to include a default case to handle invalid inputs.

```cpp
#include<iostream>
using namespace std;

int main(){
    int code;
    cout<<"enter course code: \n";
    cin>>code;

    switch(code) {
        case 401 : cout<<"KIN. SYNTHESIS OF LINKAGE"<<endl;
        break;
        case 405 : cout<<"MECHANICAL VIBRATIONS "<<endl;
        break;
        case 407 : cout<<"ELEC.ACTUATIONS OF MECH.SYS."<<endl;
        break;
        case 408 : cout<<"STRENGTH OF MATERIALS 2  "<<endl;
        break;
        case 410 : cout<<"CENTRIFUGAL PUMP BLOWER  "<<endl;
        break;
        default: cout<<"Enter a valid course code!!\n ";
    }
}
```

Q5. Write a program to read one of the codes “C” for circle, “S” for square, or “T” for a triangle, and a number representing the radius of the circle, the side of the square, or the sides of the triangle, respectively. Then calculate and display the area and the perimeter of that geometric figure with appropriate labels.

```cpp
#include<iostream>
#include<cmath>
using namespace std;

int main(){
    char shape;
    double a,b,c;
    cout<<"enter shape:'C' for circle, 'S' for square 'T' for a triangle \n";
    cin>>shape;

    if (shape=='C'|| shape=='c') {
        cout<<"Enter the radius of circle: \n";
        cin>>a;
        cout<<"Area= "<<M_PI*a*a<<" Perimeter= "<<2*M_PI*a<<endl;
    }
    else if (shape=='S'|| shape=='s') {
        cout<<"Enter the side length of square: \n";
        cin>>a;
        cout<<"Area= "<<a*a<<" Perimeter= "<<4*a<<endl;
    }
    else if (shape=='T'|| shape=='t') {
        cout<<"Enter the side lengths of right angle triangle: \n";
        cin>>a>>b;
        cout<<"Area= "<<0.5*a*b<<" Perimeter= "<<a+b+sqrt(a*a+b*b)<<endl;
    }
}
```

Q6. Write a program to order three arbitrary numbers that are input from keyboard. Use an increasing order.

```cpp
#include<iostream>
#include<cmath>
using namespace std;

int main(){
    double a,b,c;
    cout<<"enter 3 numbers \n";
    cin>>a>>b>>c;

if(a<b && a<c) {
    if (b<c) cout<<a<<b<<c;
}
else if(b<a && b<c) {
    if (a<c) cout<<b<<a<<c;
}
}
```