1. (20 pts) Complete the following code.

```
int i, ia, ib, im=0, ig, iholder;
char ca, cb=;

do{
  cout << "Enter a and b (a!=b):";
  cin >> ia >> ib;
}while(                              ); //ia and ib are equal

if(            ){  // ia is greater than  ib
//swap iand ib



}

do{
  cout << "Enter a lowercase letter: ";
  cin >> ca;
}while(                      ); //ca is not a lowercase letter

do{
  cout << "Enter an uppercase letter: ";
  cin >> cb;
}while(                   ); //cb is not an uppercase letter

//display all the characters between cb and ca (inclusive)
for(            ;                ;            ){

}

//assign ia to i


do{
 //assign i*i*i - 2*i to ig

 //if ig is greater than im and i is a multiple of 5
 if(                            ){
    //assign ig to im
```

```
    }

  //increment i by 1


}while(                          ); //i is between ia and ib (inclusive)

//display im
```

2. (20 pts) Write a C++ program that prompts the user to enter four numbers. The program proceeeds to display the minimum of the four numbers.

3. (20 pts) Write a program that uses while loops to perform the following steps:
   a. Prompt the user to input two integers: firstNum and secondNum
      (firstNum must be less than secondNum).
   b. Output all odd numbers between firstNum and secondNum.
   c. Output the sum of all even numbers between firstNum and secondNum.
   d.Output the sum of the square of the odd numbers between firstNum and secondNum.

4. (20 pts) Write a program that mimics a calculator. The program should take as input two integers and the operation to be performed. It should then output the numbers, the operator, and the result. (For division, if the denominator is zero, output an appropriate message.) Some sample outputs follow:
   3 + 4 = 7
   13 * 5 = 65

5. (10 pts) State what output, if any, results from each of the following statements.
   a. int x = 15, y=3;
      if(x + y > 17 || y - x < 20){
          y = x - y;
          x = y + x;

```
        } else {
              x = y - x+ y%5;
        }
      cout << x << y;


  b. int digit=25;
     switch(digit/4){
            case 0:
         case 1:
            cout << "low." << endl;
            break;
         case 2:
            cout << "middle." << endl;
         case 3:
            cout << "high." <<endl;
        }



   c. int x=5, y=10;
      while(x<y){
            x = x*2;
      }
      cout << x << y;


   d. for(int i=1; i<=2; i++){
            cout << "*";
      }
```

6. (10 pts) Equivalent statements.
   a. Write an equivalent while loop.

```
     for(int i=4; 2*i<=9; i*=3){
       int j = i*i - 2*i + i%3;
        cout << j;
      }
```

   b. Write an equivalent switch statement.

```
      int k=4;
      if(k%4 == 0){
            k++;
      } else if(k%4 == 1){
```

```
      k--;
  } else if(k%4 == 2){
    k*=2;
  } else {
    k/=4;
  }
```