Burton Rosenberg

Midterm

There are four problems each worth five points for a total of 20 points. Show all your work, partial credit will be awarded. Space is provided on the test for your work; if you use a blue book for additional workspace, sign it and return it with the test. No notes, no collaboration.

Name: _____

Problem	Credit
1	
2	
3	
4	
Total	

1. Write a class containing a `static final boolean HELLO` and a main method. The main method prints `Hello World` if HELLO is true, and `Good-bye` if HELLO is false.

   Answer:

   ```
   class Hello {

      static final boolean HELLO = true ;

      public static void main(String [] args) {
         if ( HELLO==true ) {
            System.out.println("Hello World") :
         } else {
            System.out.println("Good-bye") ;
         }
      }

   }
   ```

2. Write a class that sums positive integers input by the user, printing the total and exiting when the user inputs an integer which is zero or negative. For instance,

```
> 3
> 6
> 1
> 0
Total = 10
```

To get input, just assume that there is a provided method `getInteger()` that returns the value of the integer typed by the user. This method also types the user prompt, that is, the `>` at the beginning of each line on which the user is to input an integer. Also assume that if the user types in something which is not a number, `getInteger()` returns a zero.

```
Answer:

class SumIt {

   public static void main ( String [] args ) {

       int total = 0 ;
       int value = getInteger() ;

       while ( value > 0 ) {
          total = total + value ;
          value = getInteger() ;
       }
       System.out.println("total= "+total) ;
   }

}
```

3. Write a class that prints out any integer which is either multiple of 5 or 7, one per line, in ascending order. The largest number it needs to print is set by `static final int LARGEST_TO_PRINT`. Here is example output when `LARGEST_TO_PRINT` is set to 22.

```
5
7
10
14
15
20
21
```

Answer:

```
class PrintMultiples {

    static final int LARGEST_TO_PRINT = 22 ;

    public static void main( String [] args ) {

        int i = 0 ;
        while ( i <= LARGEST_TO_PRINT ) {
          if ( i%5==0 ) {
             System.out.println( i ) ;
          }
          else if ( i%7==0 ) {
             System.out.println( i ) ;
          }
          i++ ;
        }
    }

}
```

4. Write a recursive method which multiplies two positive integers using the recursion formula:

$$
x \cdot y \;\; = \;\; \begin{cases} 0 & \text{if } y == 0 \\ 2(x \cdot (y/2)) & \text{if } y \text{ is even} \\ x + x \cdot (y-1) & \text{if } y \text{ is odd} \end{cases}
$$

You need only show me the `static int` method which does the recursion. The main method and the enclosing class braces are not important.

Answer:

```
static int recMult(int x, int y) {

   if ( y==0 ) return 0 ;
   if ( y%2==0 ) {
      int t = recMult(x,y/2) ;
      return t+t ;
   }
   return x + recMult(x,y-1) ;

}
```