

Part 1 (4 pts): Draw a representation of what the computer's memory looks like at the end of the following program.

```
public class Boolean_values {  
    public static void main(String [] args) {  
        int x = 3;  
        double y = 4.7;  
        boolean b = x <= y && y <= 2 * x;  
        boolean c = 2 * x == x + 3;  
    }  
}
```

3, 4.7, true, true

Part 2 (4 pts): Select the correct printout result of the following program

1) The following program will print out (**c**)

```
x=90  
if (x<60) {  
    System.out.println ("Case 1");  
    if (x < 80)  
        System.out.println ("Case 2");  
    }  
else  
    System.out.println ("Case 3");
```

(a) Case 1 (b) Case 2 (c) Case 3 (d) Others

2) The following program will print out (**a**)

```
x=90  
if (x>60) {  
    System.out.println ("Case 1");  
    if (x < 80)  
        System.out.println ("Case 2");  
    }  
else  
    System.out.println ("Case 3");
```

(a) Case 1 (b) Case 2 (c) Case 3 (d) Others

3) The following program will print out (**d**)

```
x=70  
if (x>60) {  
    System.out.println ("Case 1");  
    if (x < 80)  
        System.out.println ("Case 2");  
    }  
else  
    System.out.println ("Case 3");
```

(a) Case 1 (b) Case 2 (c) Case 3 (d) Others

- 4) The following program will print out (d)
- ```

x=90
if (x>60)
System.out.println ("Case 1");
if (x < 80)
System.out.println ("Case 2");
else
System.out.println ("Case 3");

```
- (a) Case 1      (b) Case 2      (c) Case 3      (d) Others

**Part 3** (3 pts): Given the number grade in the test, the following program will print out if the student passed the test or not.

---

```

Scanner keyboard = new Scanner(System.in);
int grade = keyboard.nextInt();
if (grade >=60)
System.out.print("passed");
else
System.out.print("failed");

```

Complete the following programs to print the same results as the above program does.

- 1) 

```

if (60 ___<=___ grade)
System.out.print("passed");
else
System.out.print("failed");

```
- 2) 

```

if (59 ___>=___ grade)
System.out.print("failed");
else
System.out.print("passed");

```
- 3) 

```

if (!(60 ___>___ grade))
System.out.print("passed");
else
System.out.print("failed");

```

**Part 4** (11 pts): Complete the following programs to print out the expected results:

a. Identify the value for a given “int” type variable “g”. If it is in the range of (0..100), print out the corresponding answer “Yes”; otherwise, “No”.

```

if (___0<g && g < 100_____)
System.out.print ("Yes");

_____else_____
System.out.print ("No");

```

b. Identify the given year in an “int” type variable “g” to see if it is a leap year. In the Gregorian calendar 3 criteria must be taken into account to identify leap years:

- The year is evenly divisible by 4;
- If the year can be evenly divided by 100, it is NOT a leap year, unless;
- The year is also evenly divisible by 400. Then it is a leap year.

Print out the corresponding answer “Yes” or “No.

```

if (__g%100 !=0 && g%4==0 || g%400 == 0 _____

_____)
System.out.print (“Yes”);

 else _____
System.out.print (“No”);

```

**Part 5 (10 pts):** Given the call number of a book via keyboard (stored in variable n), display the location of it in the library stacks according to the following table.

| Call number                  | Location    |
|------------------------------|-------------|
| 100 to 500 and over 900      | main floor  |
| 510 to 900 except 700 to 750 | upper floor |
| 700 to 750                   | archives    |

```

int n = keyboard.nextInt();

if __ (100<=n && n <=500 || n > 900) _____
 System.out.println (“main floor”);

 else if _____ (510<=n && n <700 || 750<n && n<=900) _____
 System.out.println (“upper floor”);

 else if _____ (700 <=n && n<=750) _____
 System.out.println (“archives”);
 else
 System.out.println (“Invalid call number”);

```

**Part 6 (6 pts):** Develop the program to calculate the tip of the meal. After read the amount of bill (double number) from the keyboard, your program will calculate the 15% tip, with the minimum \$2, but cannot exceed the amount of the meal price itself. Then, your program will print this tip amount.

---

```
double bill = keyboard.nextDouble();
double tip = 0.15 * bill;
// your program will start from here.
if (tip >=2)
 System.out.println(tip);
else
 if (bill >=2)
 System.out.println(2);
 else
 System.out.println(bill);
```