

Question 1 (8 Marks):

(i)- Circle the operator which is not a relational operator?

- a. ==
- b. <
- c. !=
- d. &&
- e. >=

(ii)- If **value** is a Boolean variable, which of the following logical expressions always has the value FALSE?

- a. value && value
- b. value || value
- c. value && ! value
- d. value || ! value
- e. b and d above

(iii)- After execution of the following code, what will be the value of **angle** if the input value is 15?

```
angle = in.nextInt();  
if (angle > 5)  
    angle = angle + 5;  
else if (angle > 10)  
    angle = angle + 10;  
else angle = 5;
```

- a. 5
- b. 15
- c. 25
- d. 20

(iv)- Which statement is correctly written? (suppose that beta is an integer variable and result is a Boolean variable)

- a. result = 0 < beta < 100 ;
- b. result = 0 < beta && beta < 100 ;
- c. result = (0 < beta) && (beta < 100) ;
- d. b and c above
- e. a, b, and c above

Question 2 (6 Marks):**Convert the following switch statement into if –else statement**

```
String dayString1, dayString2, dayString3;
int day = in.nextInt();
switch (day) {
    case 1: dayString1 = "Saturday";
    case 2: dayString2 = "Sunday";
        break;
    case 3: dayString3 = "Monday";
        break;
    case 4: dayString1 = "Tuesday";
    case 5: dayString2 = " Wednesday";
        break;
    default: dayString3 = "Invalid day";
        break;
}
```

Answer :

```
if ( day == 1 ){ // because no break after case 1
    dayString1 = "Saturday";
    dayString2 = "Sunday";
}
else if ( day == 2 ) {
    dayString2 = "Sunday";
}
else if ( day == 3 ) {
    dayString3 = "Monday";
}
else if ( day == 4 ) { // because no break after case 4
    dayString1 = " Tuesday ";
    dayString2 = " Wednesday ";
}
else if ( day == 5 ) {
    dayString2 = " Wednesday ";
}
else
    dayString3 = "Invaild day";
```

Question 3 (8 Marks):

**We would like to write a program that reads a number of seconds, a number of minutes and a number of hours . It converts them into seconds and print the result.
For that:**

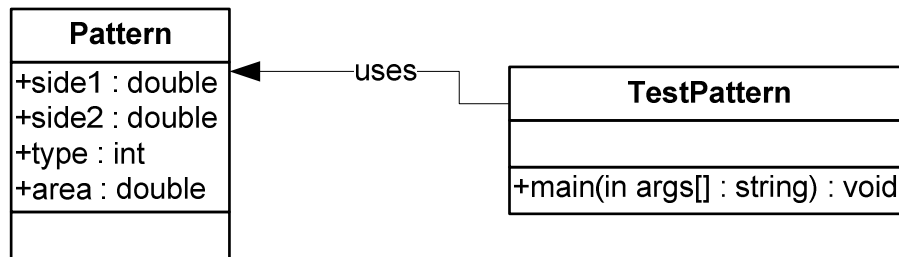
1. determine the input and the output
2. list the needed variables and their types
3. write down a suitable conversion formula(s) that solves the problem
4. Suggest and write a complete java program solution

Answer :

- 1- Input : seconds , min , hours all integers output: total second integer
- 2- -----
- 3- -----

```
Scanner read = new Scanner(System.in);
System.out.print(" Enter hours : ");
int hour = read.nextInt();
System.out.print(" Enter min : ");
int min = read.nextInt();
System.out.print(" Enter second : ");
int second = read.nextInt();

int total = (hour*3600 ) + (min * 60 ) + second ;
System.out.print(" total in second : " + total );
```

Question 4 (8 Marks):

Consider the class *Pattern* with the following attributes:

Side1 : represents a length side of the pattern

Side2 : represents another length side of the pattern

type : represents the type of the pattern (rectangle, triangle or square)

area : represents the area of the pattern

- a- Implement the class *Pattern*.
- b- Write a java program that performs the following:
 - i- creates an object of the class *Pattern*.
 - ii- reads the **needed attributes** and **calculates the area** with respect to the **type** of the pattern according to the following table.

Pattern	Type	side1	side2	Area
Rectangle	1	height	Width	side1*side2
Triangle	2	height	Base	side1*side2/2
Square	3	side	--	side1*side1

Example if type is 1 the pattern is a rectangle, side1 will represent the height, side2 will represent the width and the area will be equal to side1*side2.

- iii- Displays the **name** of the pattern (rectangle, triangle or square) and its **area**

Answer : **use if statement**

```

public class Pattern {

    public double side1 , side2 , area ;
    public int type ;

}

import java.util.Scanner;

public class Ex3 {
  
```

```
public static void main(String[] args) {

    Scanner read = new Scanner(System.in);
    Pattern p = new Pattern();
    System.out.print(" Enter type ");
    p.type = read.nextInt();

    if ( p.type == 1 ){ // rectangle
        System.out.print(" Enter length ");
        p.side1 = read.nextDouble();
        System.out.print(" Enter wedth ");
        p.side2 = read.nextDouble();
        p.area = p.side1 * p.side2 ;
        System.out.print(" the shape is rectangle ,
and area = " + p.area);

    }
    else if ( p.type == 2 ){ // Triangle
        System.out.print(" Enter height ");
        p.side1 = read.nextDouble();
        System.out.print(" Enter base ");
        p.side2 = read.nextDouble();
        p.area = (p.side1 * p.side2) / 2 ;
        System.out.print(" the shape is Triangle ,
and area = " + p.area);
    }
    else if ( p.type == 3 ){
        System.out.print(" Enter side ");
        p.side1 = read.nextDouble();
        p.area = p.side1 * p.side1;
        System.out.print(" the shape is square , and
area = " + p.area);
    }

}
}
```

use switch statement

```
public class Ex3 {

    public static void main(String[] args) {

        Scanner read = new Scanner(System.in);
        Pattern p = new Pattern();
        System.out.print(" Enter type ");
        p.type = read.nextInt();
```

```
        switch( p.type ){

            case 1 : // rectangle
                System.out.print(" Enter length ");
                p.side1 = read.nextDouble();
                System.out.print(" Enter wedth ");
                p.side2 = read.nextDouble();
                p.area = p.side1 * p.side2 ;
                System.out.print(" the shape is rectangle ,
and area = " + p.area);
                break;

            case 2 :
            { // Triangle
                System.out.print(" Enter height ");
                p.side1 = read.nextDouble();
                System.out.print(" Enter base ");
                p.side2 = read.nextDouble();
                p.area = p.side1 * p.side2 * 0.5 ;
                System.out.print(" the shape is Triangle ,
and area = " + p.area);
                break;
            }

            case 3 :{
                System.out.print(" Enter side ");
                p.side1 = read.nextDouble();
                p.area = p.side1 * p.side1;
                System.out.print(" the shape is square , and
area = " + p.area);
                break;
            }

        }

    }
}
```