Chapter 3: Making decisions

1. Which of the following data types can be used in a switch expression? (Choose all that apply.)

```
A. enum
B. int
C. Byte
D. long
E. String
F. char
G. var
H. double
```

2. What is the output of the following code snippet? (Choose all that apply.)

```
3: int temperature = 4;
4: long humidity = -temperature
+ temperature * 3; //humidity = 8
5: if (temperature>=4)
6: if (humidity < 6) System.out.println("Too Low");
7: else System.out.println("Just Right");
8: else System.out.println("Too High");

A. Too Low
B. Just Right
C. Too High
D. A NullPointerException is thrown at runtime.
E. The code will not compile because of line 7.
F. The code will not compile because of line 8.
```

3. Which of the following data types are permitted on the right side of a for-each expression? (Choose all that apply.)

```
A. Double[][]
B. Object
C. Map
D. List
E. String
F. char[]
G. Exception
H. Set
//Son permitidos los tipos de datos que
    tienen elementos iterables
```

4. What is the output of calling printReptile(6)?

```
void printReptile(int category) {
    var type = switch(category) {
        case 1,2 ->"Snake";
        case 3,4 -> "Lizard";
        case 5,6 -> "Turtle";
        case 7,8 -> "Alligator";
    };
    System.out.print(type);
}

A. Snake
B. Lizard
C. Turtle
D. Alligator
E. TurtleAlligator
F. None of the above
//Falta el caso default
```

5. What is the output of the following code snippet?

```
List<Integer> myFavoriteNumbers = new ArrayList<>();
myFavoriteNumbers.add(10);
```

```
myFavoriteNumbers.add(14);
for (var a : myFavoriteNumbers) {
    System.out.print(a + ", ");
    break;
}
for (int b : myFavoriteNumbers) {
    continue;
    System.out.print(b + ", ");
}
for (Object c : myFavoriteNumbers)
    System.out.print(c + ", ");

A. It compiles and runs without issue but does not produce
any output.
B. 10, 14,
C. 10, 10, 14,
D. 10, 10, 14, 10, 14,
E. Exactly one line of code does not compile.
//La parte de continue salta el sysout
F. Exactly two lines of code do not compile.
G. Three or more lines of code do not compile.
H. The code contains an infinite loop and does not terminate.
```

6. Which statements about decision structures are true? (Choose all that apply.)

```
A. A for-each loop can be executed on
    any Collections Framework object.
B. The body of a while loop
    is guaranteed to be executed at least once.
C. The conditional expression of a for loop is
    evaluated before the first execution of the loop body.
D. A switch expression that takes a String and assigns
    the result to a variable requires a default branch.
E. The body of a do/while loop is guaranteed
    to be executed at least once.
```

```
F. An if statement can have multiple
    corresponding else statements.
```

7. Assuming weather is a well-formed nonempty array, which code snippet, when inserted independently into the blank in the following code, prints all of the elements of weather? (Choose all that apply.)

```
private void print(int[] weather) {
    for( ) {
        System.out.println(weather[i]);
    }
}
A. int i=weather.length; i>0; i--
B.int i=0; i<=weather.length-1;++i
//Recorre los elementos de weather de acuerdo a su longitud-1.
C. var w : weather
D. int i=weather.length-1; i>=0; i--
//Recorre los elementos de weather pero del ultimo al primero.
E. int i=0, int j=3; i<weather.length; ++i
F. int i=0; ++i<10 && i<weather.length;
G. None of the above
```

8. What is the output of calling printType(11)?

```
31: void printType(Object o) {
32:    if(o instanceof Integer bat) {
33:       System.out.print("int");
34:    } else if(o instanceof Integer bat && bat < 10) {
35:       System.out.print("small int");
36:    } else if(o instanceof Long bat || bat <= 20) {
37:       System.out.print("long");
38:    } default {
39:       System.out.print("unknown");
40:    }
41: }
```

```
A. int
B. small int
C. long
D. unknown
E. Nothing is printed.
F. The code contains one line that does not compile.
//default no puede ser utilizado en if.
G. The code contains two lines that do not compile.
H. None of the above
```

9. Which statements, when inserted independently into the following blank, will cause the code to print 2 at runtime? (Choose all that apply.)

```
int count = 0;
BUNNY: for(int row = 1; row <=3; row++)
    RABBIT: for(int col = 0; col <3 ; col++) {
        if((col + row) % 2 == 0)
            ---------;
        count++;
    }
System.out.println(count);

A. break BUNNY
B. break RABBIT
C. continue BUNNY
D. continue RABBIT
E. break
F. continue
G. None of the above, as the code contains a compiler error.
//Cuando el contador llega a 2 se busca salir del loop,
    las opciones B, C y E, regresan al loop inicial.
```

10. Given the following method, how many lines contain compilation errors? (Choose all that apply.)

```
10: private DayOfWeek getWeekDay(int day, final int thursday) {
11:    int otherDay = day;
12:    int Sunday = 0;
13:    switch(otherDay) {
14:       default:
15:       case 1: continue;
16:       case thursday: return DayOfWeek.THURSDAY;
17:       case 2,10: break;
18:       case Sunday: return DayOfWeek.SUNDAY;
19:       case DayOfWeek.MONDAY: return DayOfWeek.MONDAY;
20:    }
21:    return DayOfWeek.FRIDAY;
22: }

A. None, the code compiles without issue.
B. 1
C. 2
D. 3
//continue no se puede utilizar,
    thuesday es un parametro y no se utiliza final,
    DayOfWeek.MONDAY no es int.
E. 4
F. 5
G. 6
H. The code compiles but may produce an error at runtime.
```

11. What is the output of calling printLocation(Animal.MAMMAL)?

```
10: class Zoo {
11:    enum Animal {BIRD, FISH, MAMMAL}
12:    void printLocation(Animal a) {
13:       long type = switch(a) {
14:       case BIRD ->1;
15:       case FISH ->2;
16:       case MAMMAL ->3;
```

```
17:       default ->4;
18:    };
19:    System.out.print(type);
20: } }
```

A. 3
//La salida seria 3 porque se utilizo MAMMAL.
B. 4
C. 34
D. The code does not compile because of line 13.
E. The code does not compile because of line 17.
F. None of the above

12. What is the result of the following code snippet?

```
3: int sing = 8, squawk = 2, notes = 0;
4: while(sing > squawk) {
5:    sing--; //7, 6
6:    squawk += 2; //4, 6
7:    notes += sing + squawk;
8: }
9: System.out.println(notes);
```

A. 11
B. 13
C. 23
D. 33
E. 50
F. The code will not compile because of line 7.

13. What is the output of the following code snippet?

```
2: boolean keepGoing = true;
3: int result = 15, meters = 10;
4: do {
```

```
5:    meters--;
6:    if(meters==8) keepGoing = false;
7:    result -=2;
8: } while keepGoing; //while(keepGoing)
9: System.out.println(result);

A. 7
B. 9
C. 10
D. 11
E. 15
F. The code will not compile because of line 6.
G. The code does not compile for a different reason.
//Error de sintaxis, faltan paréntesis en la linea 8.
```

14. Which statements about the following code snippet are correct? (Choose all that apply.)

```
for(var penguin : new int[2])
    System.out.println(penguin);
var ostrich = new Character[3];
for(var emu : ostrich)
    System.out.println(emu);
List<Integer> parrots = new ArrayList<Integer>();
for(var macaw : parrots)
    System.out.println(macaw);

A. The data type of penguin is Integer.
B. The data type of penguin is int.
// Contiene un new int, por lo que penguin
    toma este tipo de dato.
C. The data type of emu is undefined.
D. The data type of emu is Character.
//Como el tipo de dato de ostrich es Character,
    es el tipo de dato que tomara emu.
```

```
E. The data type of macaw is List.
F. The data type of macaw is Integer.
//parrots es un objeto de tipo List con elementos Integer,
    por lo tanto macaw sera Integer.
G. None of the above, as the code does not compile.
```

15. What is the result of the following code snippet?

```
final char a = 'A', e = 'E';
char grade = 'B';
switch (grade) {
    default:
    case a:
    case 'B': 'C': System.out.print("great ");
    case 'D': System.out.print("good "); break;
    case e:
    case 'F': System.out.print("not good ");
}

A. great
B. great good
C. good
D. not good
E. The code does not compile because the data type
of one or more case statements does not match the
data type of the switch variable.
F. None of the above
//No se pueden utilizar case B y B separados por ":"
```

16. Given the following array, which code snippets print the elements in reverse order from how they are declared? (Choose all that apply.)

```
char[] wolf = {'W', 'e', 'b', 'b', 'y'};
A. int q = wolf.length;
     for( ; ; ) {
```

```
      System.out.print(wolf[--q]);
      if(q==0) break;
   }
//Toma la longitud de wolf y comienza desde la utlima posición,
cuando q == 0 se sale del ciclo for.
B. for(int m=wolf.length-1;m>=0; --m)
      System.out.print(wolf[m]);
//Se toma la longitud total de wolf, y se decrementa el valor
    de la variable que lo contiene en cada ciclo mientras
    sea mayor o igual a 0.
C. for(int z=0; z<wolf.length; z++)
       System.out.print(wolf[wolf.length-z]);
D. int x = wolf.length-1;
       for(int j=0; x>=0 && j==0; x--)
            System.out.print(wolf[x]);
E. final int r = wolf.length;
     for(int w = r-1;r>-1;w = r-1)
         System.out.print(wolf[w]);
F. for(int i=wolf.length; i>0; --i)
       System.out.print(wolf[i]);
G. None of the above
```

17. What distinct numbers are printed when the following method is executed? (Choose all that apply.)

```
private void countAttendees() {
    int participants = 4, animals = 2, performers = -1;
    while((participants = participants+1) < 10) {}
    do {} while (animals++ <= 1); //animals = 2, 3
    for( ; performers<2; performers+=2) {}
            //performers = -1, 1, 3
    System.out.println(participants);
    System.out.println(animals);// 3
    System.out.println(performers); // 3
}
```

```
A. 6
B. 3
C. 4
D. 5
E. 10
F. 9
G. The code does not compile.
H. None of the above
```

18. Which statements about pattern matching and flow scoping are correct? (Choose all that apply.)

```
A. Pattern matching with an if statement is
    implemented using the instance operator.
B. Pattern matching with an if statement is
    implemented using the instanceon operator.
C. Pattern matching with an if statement is
    implemented using the instanceof operator.
//instanceof se utiliza con if para conocer
    si un objeto es parte de otra clase.
D. The pattern variable cannot be accessed
    after the if statement in which it is declared.
E. Flow scoping means a pattern variable is
    only accessible if the compiler can discern its
    type.
//En flow scoping el flujo de ejecución del programa
    delimitara el alcance de las variables.
F. Pattern matching can be used to declare a
    variable with an else statement.
```

19. What is the output of the following code snippet?

```
3: do {
4:    int snake = 1;
```

```
5:    System.out.print(snake++ + " ");
6:    iguana--;
7: } while (snake <= 5);
8: System.out.println(iguana);

A. 1 2 3 4 -4.0
B. 1 2 3 4 -5.0
C. 1 2 3 4 5 -4.0
D. 0 1 2 3 4 5 -5.0
E. The code does not compile.
//La variable iguana deberia ser declarada antes
    del ciclo do while.
F. The code compiles but produces an infinite loop at runtime.
G. None of the above
```

20. Which statements, when inserted into the following blanks, allow the code to compile and run without entering an infinite loop? (Choose all that apply.)

```
4: int height = 1;
5:    L1: while(height++ <10) {
6:    long humidity = 12;
7:    L2: do {
8:       if(humidity--% 12 == 0) ;
9:       int temperature = 30;
10:      L3: for( ; ; ) {
11:         temperature++;
12:            if(temperature>50) ;
13:      }
14:    } while (humidity > 4);
15: }

A. break L2 on line 8; continue L2 on line 12
B. continue on line 8; continue on line 12
C. break L3 on line 8; break L1 on line 12
D. continue L2 on line 8; continue L3 on line 12
```

```
E. continue L2 on line 8; continue L2 on line 12
//Evitaria un loop infinito en for.
F. None of the above, as the code contains a compiler error
```

21. A minimum of how many lines need to be corrected before the following method will compile?

```
21: void findZookeeper(Long id) { //id no puede ser long
22:    System.out.print(switch(id)
23:       case 10 ->{"Jane"} //Faltan ";"
24:       case 20 ->{yield "Lisa";}; //Tiene dos ";"
25:       case 30 ->"Kelly";
26:       case 30 ->"Sarah";
                                        //Linea 25 y 26 tiene e
27:       default ->"Unassigned";
28:    });
29: }

A. Zero
B. One
C. Two
D. Three
E. Four
F. Five
```

22. What is the output of the following code snippet? (Choose all that apply.)

```
3: final var one = 1;
4: switch (tailFeathers) {
5:    case one: System.out.print(3 + " ");
6:    default: case 3: System.out.print(5 + " "); //5
7: }
8: while (tailFeathers > 1) {
9:    System.out.print(--tailFeathers + " "); } //3 - 1 = 2
```

```
A. 3
B. 5 1
C. 5 2
D. 3 5 1
E. 5 2 1
F. The code will not compile because of lines 3–5.
G. The code will not compile because of line 6.
```

23. What is the output of the following code snippet?

```
15: int penguin = 50, turtle = 75;
16: boolean older = penguin >= turtle;
17: if (older = true) System.out.println("Success");
18: else System.out.println("Failure");
19: else if(penguin != 50) System.out.println("Other");

A. Success
B. Failure
C. Other
D. The code will not compile because of line 17.
E. The code compiles but throws an exception at runtime.
F. None of the above
//else if debería estar despues de if.
```

24. Which of the following are possible data types for friends that would allow the code to compile? (Choose all that apply.)

```
for(var friend in friends) {
    System.out.println(friend);
}

A. Set
B. Map
C. String
D. int[]
```

```
E. Collection
F. StringBuilder
G. None of the above
//No es un for each
```

25. What is the output of the following code snippet?

```
6: String instrument = "violin";
7: final String CELLO = "cello";
8: String viola = "viola";
9: int p = -1;
10: switch(instrument) {
11:    case "bass" : break;
12:    case CELLO : p++;
13:    default: p++;
14:    case "VIOLIN": p++;
15:    case "viola" : ++p; break;
16: }
17: System.out.print(p);

A. -1
B. 0
//Aumenta el valor de p = -1, a p = 1
C. 1
D. 2
E. 3
F. The code does not compile.
```

26. What is the output of the following code snippet? (Choose all that apply.)

```
9: int w = 0, r = 1;
10: String name = "";
11: while(w < 2) {
12:    name += "A";
13:    do {
```

```
14:       name += "B";
15:       if(name.length()>0) name += "C";
16:       else break;
17:    } while (r <=1);
18:    r++; w++; }
19: System.out.println(name);

A. ABC
B. ABCABC
C. ABCABCABC
D. Line 15 contains a compilation error.
E. Line 18 contains a compilation error.
F. The code compiles but never terminates at runtime.
//Se forma un loop infinito en el do while interior
    porque r nunca actualiza su valor.
G. The code compiles but throws a NullPointerException
at runtime.
```

27. What is printed by the following code snippet?

```
23: byte amphibian = 1;
24: String name = "Frog";
25: String color = switch(amphibian) {
26:    case 1 ->{ yield "Red"; }
27:    case 2 ->{ if(name.equals("Frog")) yield "Green"; }
28:    case 3 ->{ yield "Purple"; }
29:    default ->throw new RuntimeException();
30: };
31: System.out.print(color);

A. Red
B. Green
C. Purple
D. RedPurple
E. An exception is thrown at runtime.
```

```
F. The code does not compile.
//Causa un error por el condicional de la linea 27
```

28. What is the output of calling getFish("goldie")?

```
40: void getFish(Object fish) {
41:    if (!(fish instanceof String guppy))
42:       System.out.print("Eat!");
43:    else if (!(fish instanceof String guppy)) {
44:       throw new RuntimeException();
45:    }
46:    System.out.print("Swim!");
47: }

A. Eat!
B. Swim!
C. Eat! followed by an exception.
D. Eat!Swim!
E. An exception is printed.
F. None of the above
//No compila porque las variable guppy esta definida dos veces.
```

29. What is the result of the following code?

```
1: public class PrintIntegers {
2: public static void main(String[] args) {
3: int y = -2;
4: do System.out.print(++y + " ");
5: while(y <= 5);
6: } }

A. -2-1 0 1 2 3 4 5
B. -2-1 0 1 2 3 4
C. -1 0 1 2 3 4 5 6
//Iniciara con -2 a la entrada, se imprimira -1
```

```
    y el ciclo se repetira hasta que y sea igual a 6.
D. -1 0 1 2 3 4 5
E. The code will not compile because of line 5.
F. The code contains an infinite loop and does not terminate.
```