1. (1 point) What is the result of compiling and executing the following class?

```
1 public class Tolls {
2     private static int yesterday = 1;
3     int tomorrow = 10;
4     public static void main(String[] args) {
5         Tolls tolls = new Tolls();
6         int today=20, tomorrow = 40;
7         System.out.print(today + tolls.tomorrow + tolls.
             yesterday);
8     }
9 }
```

A. The code does not compile due to line 6.

B. The code does not compile due to line 7.

C. 31

D. 61

2. (1 point) Given the following class definition, which is the only line that does not contain a compilation error?

```
1 public ThisClassDoesNotCompile {
2     double int count;
3     void errors() {}
4     static void private limit; }
```

A. Line 1

B. Line 2

C. Line 3

D. Line 4

3. (1 point) Which of the following features allows a Java class to be run on a wide variety of computers and devices?

A. Encapsulation

B. Object oriented

C. Inheritance

D. Platform independence

4. (1 point) Which of the following is not a property of a JVM?

A. It prevents Java bytecode from being easily decoded/decompiled.

B. It supports platform independence.

C. It manages memory for the application.

D. It translates Java instructions to machine instructions.

5. (1 point) Which of the following variables are always in scope for the entire program?

   A. Package variables

   B. Class variables

   C. Instance variables

   D. Local variables

6. (1 point) Given the following wildcard import statements, which class would be included in the import?

```
import television.actor.*;
import movie.director.*;
```

   A. television.actor.recurring.Marie

   B. movie.directors.John

   C. television.actor.Package

   D. movie.NewRelease

7. (1 point) Which is the correct order of statements for a Java class file?

   A. import statements, package statement, class declaration

   B. package statement, class declaration, import statement

   C. class declaration, import statements, package declaration

   D. package statement, import statements, class declaration

8. (1 point) What is the first line in the following code to not compile?

```
public static void main(String[] args) {
    int Integer = 0; // k1
    Integer int = 0; // k2
    Integer ++; // k3
    int++; // k4
}
```

   A. `k1`

   B. `k2`

   C. `k3`

   D. `k4`

9. (1 point) Suppose `foo` is a reference to an instance of a class. Which of the following is not true about `foo.bar`?

   A. `bar` is an instance variable.

   B. `bar` is a local variable.

   C. It can be used to read from `bar`.

D. It can be used to write to `bar`.

10. (1 point) Which of the following is not a valid class declaration?

    A. `class building {}`

    B. `class Cost$ {}`

    C. `class 5MainSt {}`

    D. `class _Outside {}`

11. (1 point) Which of the following can fill in the blanks to make this code compile?

```
/*YourAnswer1*/ d = new /*YourAnswer2*/(1_000_000_.00);
```

    A. `double, double`

    B. `double, Double`

    C. `Double, double`

    D. None of the above

12. (1 point) Which is correct about a local variable of type `String`?

    A. It defaults to an empty string.

    B. It defaults to `null`.

    C. It does not have a default value.

    D. It will not compile without initializing on the declaration line.

13. (1 point) Of the types double, `int`, `long`, and `short`, how many could fill in the blank to have this code output `0`?

```
static /*YourAnswer*/ defaultValue;

    public static void main(String[] args) {
        System.out.println(defaultValue);
    }
```

    A. One

    B. Two

    C. Three

    D. Four

14. (1 point) Which of the following is true about primitives?

    A. You can call methods on a primitive.

    B. You can convert a primitive to a wrapper class object simply by assigning it.

    C. You can convert a wrapper class object to a primitive by calling `valueOf()`.

    D. You can store a primitive directly into an `ArrayList`.

15. (1 point) What is the output of the following application?

```
package schedule;
public class PrintWeek {
    public static final void main(String[] days) {
        System.out.print(5 + 6 + "7" + 8 + 9);
    }
}
```

A. `56789`

B. `11789`

C. `11717`

D. The code does not compile.

16. (1 point) Fill in the blanks: The *blank* operator is used to find the difference between two numbers, while the *blank* operator is used to find the remainder when one number is divided by another.

A. `/, %`

B. `-, %`

C. `%, <`

D. `-, ||`

17. (1 point) What is the output of the following application?

```
package transporter;
public class Rematerialize {
    public static void main(String[] input) {
        int dog = 11;
        int cat = 3;
        int partA = dog / cat;
        int partB = dog % cat;
        int newDog = partB + partA * cat;
        System.out.print(newDog);
    }
}
```

A. `9`

B. `11`

C. `15`

D. The code does not compile.

18. (1 point) What is the output of the following application?

```
package dessert;
public class IceCream {
    public final static void main(String... args) {
        int flavors = 30;
        int eaten = 0;
        switch(flavors) {
            case 30: eaten++;
            case 40: eaten+=2;
            default: eaten--;
        }
        System.out.print(eaten);
    }
}
```

A. `1`

B. `2`

C. `3`

D. The code does not compile

19. (1 point) What is the output of the following application?

```
package mode;
public class Transportation {
    public static String travel(int distance) {
        return distance<1000 ? "train" : 10;
    }
    public static void main(String[] answer) {
        System.out.print(travel(500));
    }
}
```

A. `train`

B. `10`

C. The code does not compile.

D. The code compiles but throws an exception at runtime.

20. (1 point) Fill in the blanks: Given two non-null String objects with reference names apples and oranges, if apples *blank* oranges evaluates to true, then apples *blank* oranges must also evaluate to true.

A. `==, equals()`

B. `!=, equals()`

C. `equals(), ==`

D. `equals(), =!`

21. (1 point) For a given non-null `String myTestVariable`, what is the resulting value of executing the statement `myTestVariable.equals(null)`?

   A. `true`

   B. `false`

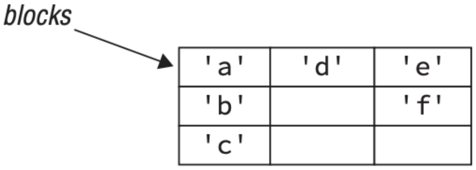
   C. The statement does not compile.

   D. The statement compiles but will produce an exception when used at runtime.

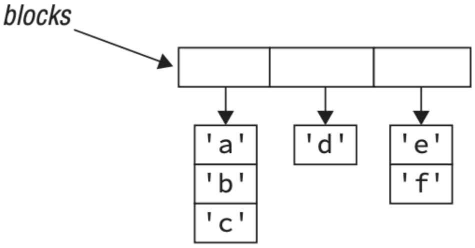
22. (1 point) Which of the options in the graphic best represent the blocks variable?

```
char[][] blocks = new char[][] {{'a', b', 'c'}, {'d'}, {'e', 'f'}};
```

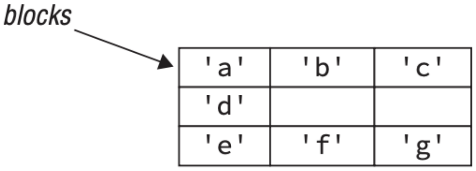
Option A



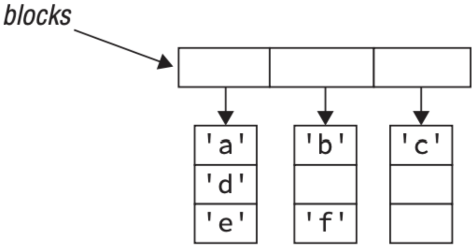
Option B



Option C



Option D



   A. Option A

   B. Option B

   C. Option C

   D. Option D

23. (1 point) What happens when calling the following method with a non-null and non-empty array?

```
public static void addStationName(String[] names) {
    names[names.length] = "Times Square";
}
```

   A. It adds an element to the array the value of which is `Times Square`.

B. It replaces the last element in the array with the value `Times Square`.

C. It does not compile.

D. It throws an exception.

24. (1 point) How many lines does the following code output?

```
String[] days = new String[] { "Sunday", "Monday", "Tuesday",
          "Wednesday", "Thursday", "Friday", "Saturday" };
for (int i = 0; i < days.size(); i++)
     System.out.println(days[i]);
```

A. Six

B. Seven

C. The code does not compile.

D. The code compiles but throws an exception at runtime.

25. (1 point) How many dimensions does the array reference moreBools allow?

```
boolean[][][] bools, moreBools;
```

A. One dimension

B. Two dimensions

C. Three dimensions

D. None of the above

26. (1 point) What is a possible output of the following code?

```
String[] strings = new String[2];
System.out.println(strings);
```

A. `[null, null]`

B. `[,]`

C. `[Ljava.lang.String;@74a14482`

D. None of the above

27. (1 point) Which is the first line to prevent this code from compiling and running without error?

```
char[][] ticTacToe = new char[3][3]; // r1
ticTacToe[1][3] = ’X’; // r2
ticTacToe[2][2] = ’X’;
ticTacToe[3][1] = ’X’;
System.out.println(ticTacToe.length + " in a row!"); // r3
```

A. Line `r1`

B. Line `r2`

C. Line `r3`

D. None of the above

28. (1 point) What is the result of running the following as `java Copier`?

```
package duplicate;
public class Copier {
    public static void main(String... original) {
        String... copy = original;
        System.out.println(copy.length + " " + copy[0]);
    }
}
```

A. `0`

B. `0` followed by an exception

C. `1` followed by an exception

D. The code does not compile.

29. (1 point) What happens when running the following code?

```
do (
    System.out.println("helium");
) while (false);
```

A. It completes successfully without output.

B. It outputs `helium` once.

C. It keeps outputting `helium`.

D. The code does not compile.

30. (1 point) Which of the following is equivalent to this code snippet given an array of String objects?

```
for (int i=0; i<fun.length; i++)
    System.out.println(fun[i]);
```

A. `for (String f = fun) System.out.println(f);`

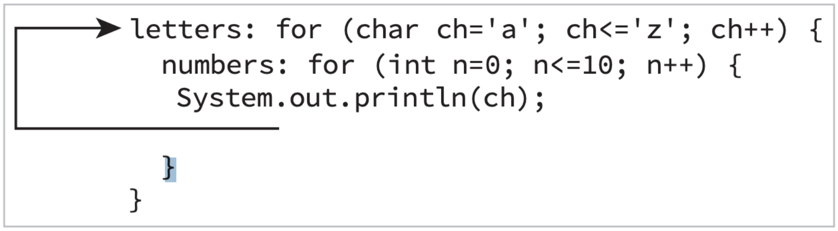
B. `for (String f :  fun) System.out.println(f);`

C. `for (String = fun) System.out.println(it);`

D. None of the above

31. (1 point) How many of these statements can be inserted after the println to have the code flow follow the arrow in this diagram?

```
break;
break letters;
break numbers;
```



```
letters: for (char ch='a'; ch<='z'; ch++) {
  numbers: for (int n=0; n<=10; n++) {
   System.out.println(ch);

  }
}
```

A. None

B. One

C. Two

D. Three

32. (1 point) Using the diagram in the previous question, how many of these statements can be inserted after the println to have the code flow follow the arrow in the diagram?

```
continue;
continue letters;
continue numbers;
```

A. None

B. One

C. Two

D. Three

33. (1 point) What does the following code output

```
int singer = 0;
while (singer > 0)
    System.out.println(singer++);
```

A. `0`

B. The code does not compile.

C. The loops completes with no output.

D. This is an infinite loop.

34. (1 point) Which of the following types is taxis not allowed to be in order for this code to compile?

```
for (Object obj : taxis) {
}
```

A. `ArrayList<Integer>`

B. `int[]`

C. `StringBuilder`

D. All of these are allowed.

35. (1 point) What is the output of the following?

```
boolean balloonInflated = false;
do {
    if (!balloonInflated) {
        balloonInflated = true;
        System.out.print("inflate-");
    }
} while (! balloonInflated);
System.out.println("done");
```

A. `done`

B. `inflate-done`

C. The code does not compile.

D. This is an infinite loop.

36. (1 point) How many `final` modifiers would need to be removed for this application to compile?

```
package end;
public final class Games {
    public final static int finish(final int score) {
    final int win = 3;
    final int result = score++ < 5 ? 2 : win;
    return result+=win;
    }
    public static void main(final String[] v) {
        System.out.print(finish(Integer.parseInt(v[0])));
    }
}
```

A. None

B. One

C. Two

D. The code will not compile regardless of the number of final modifiers that are removed.

37. (1 point) Fill in the blanks: *blank* is used to call a constructor in the parent class, while *blank* is used to reference a member of the parent class.

A. `super` and `this()`

B. `super` and `super()`

C. `super()` and `this`

D. `super()` and `super`

38. (1 point) Given the following method signature, which classes can call it?

```
void run(String government)
```

A. Classes in other packages

B. Classes in the same package

C. Subclasses in a different package

D. All classes

39. (1 point) Which statement(s) about the following class would help to properly encapsulate the data in the class?

```
package shield;
public class Protect {
    private String material;
    protected int strength;

    public int getStrength() {
        return strength;
    }
    public void setStrength(int strength) {
        this.strength = strength;
    }
}
```

1. Change the access modifier of strength to private.
2. Add a getter method for material.
3. Add a setter method for material

A. 1

B. 1 and 2

C. All 3

D. None, the data in the class is already encapsulated

40. (1 point) Which of the following is a valid method name in Java?

A. `Go_$Outside$2()`

B. `have-Fun()`

C. `new()`

D. `9enjoyTheWeather()`

41. (1 point) Which of the following lines of code can be inserted in the line below that would allow the class to compile?

```
package farm;
public class Coop {
    public final int static getNumberOfChickens() {
        // INSERT CODE HERE
    }
}
```

A. `return 3.0;`

B. `return 5L;`

C. `return 10;`

D. None of the above

42. (1 point) Which of the following is a true statement about passing data to a method?

A. A change made to a primitive value passed to a method is reflected in the calling method.

B. A change made to the data within an object passed to a method is reflected in the calling method.

C. Reassigning an object reference passed to a method is reflected in the calling method.

D. A change made to a boolean value passed to a method is reflected in the calling method.

43. (1 point) What is the output of the following application?

```
package paper;
abstract class Book {
    protected static String material = "papyrus";
    public Book() {}
    public Book(String material) {this.material = material;}
}
public class Encyclopedia extends Book {
    public static String material = "cellulose";
    public Encyclopedia() {super();}
    public String getMaterial() {return super.material;}
    public static void main(String[] pages) {
        System.out.print(new Encyclopedia().getMaterial());
    }
}
```

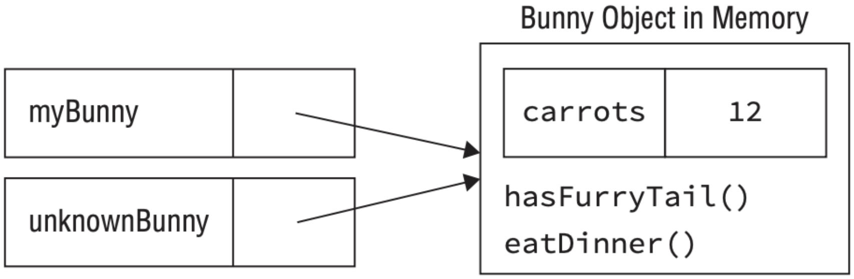
A. `papyrus`

B. `cellulose`

C. The code does not compile.

D. The code compiles but throws an exception at runtime.

44. (1 point) The following diagram shows two reference variables pointing to the same Bunny object in memory. The reference variable myBunny is of type Bunny, while unknownBunny is of an unknown data type. Which statement about the reference variables is not true? For this question, assume the instance methods and variables shown in the diagram are marked public.



A. If the unknownBunny reference does not have access to the same variables and methods that myBunny has access to, it can be explicitly cast to a reference type that does.

B. The data type of unknownBunny must be Bunny or a subclass of Bunny.

C. If the data type of unknownBunny is Bunny, it has access to all of the same methods and variables as myBunny.

D. The data type of unknownBunny could be an interface, class, or abstract class.

45. (1 point) Which of the following modifiers can be applied to an abstract method?

A. final

B. private

C. default

D. protected

46. (1 point) What is the output of the following application?

```
package space;
interface Sphere {
    default String getName() { return "Unknown"; }
}
abstract class Planet {
    abstract String getName();
}
public class Mars extends Sphere implements Planet {
    public Mars() {
        super();
    }
    public String getName() { return "Mars"; }
    public static void main(final String[] probe) {
        System.out.print(((Planet)new Mars()).getName());
    }
}
```

A. `Mars`

B. `Unknown`

C. The code does not compile due to the declaration of `Sphere`.

D. The code does not compile for another reason.

47. (1 point) Which of the following statements is correct?

A. A reference to a class can be assigned to a subclass reference without an explicit cast.

B. A reference to a class can be assigned to a superclass reference without an explicit cast.

C. A reference to an interface can be assigned to a reference of a class that implements the interface without an explicit cast.

D. A reference to a class that implements an interface can be assigned to an interface reference only with an explicit cast.

48. (1 point) Of the following four modifiers, choose the one that is not implicitly applied to all interface variables.

A. `final`

B. `abstract`

C. `static`

D. `public`

49. (1 point) What is the output of the following application?

```
package race;
abstract class Car {
    static { System.out.print("1"); }
    public Car(String name) {
        super();
        System.out.print("2");
    }
    { System.out.print("3"); }
}
public class BlueCar extends Car {
    { System.out.print("4"); }
    public BlueCar() {
        super("blue");
        System.out.print("5");
    }
    public static void main(String[] gears) {
        new BlueCar();
    }
}
```

A. `23451`

B. `12354`

C. `13245`

D. The code does not compile.

50. (1 point) Fill in the blanks: A program must handle or declare *blank* but should never handle *blank*.

A. `java.lang.Error`, unchecked exceptions

B. checked exceptions, `java.lang.Error`

C. `java.lang.Throwable`, `java.lang.Error`

D. unchecked exceptions, `java.lang.Exception`

51. (1 point) What is the result of compiling and running the following application?

```
package castles;
class CastleUnderSiegeException extends Exception {}
class KnightAttackingException extends CastleUnderSiegeException {}
public class Citadel {
    public void openDrawbridge() throws RuntimeException { // q1
        try {
            throw new KnightAttackingException();
        } catch (Exception e) {
            throw new ClassCastException();
        } finally {
            throw new CastleUnderSiegeException(); // q2
        }
    }
    public static void main(String[] moat) {
        new Citadel().openDrawbridge(); // q3
    }
}
```

A. The code does not compile because of line `q1`.

B. The code does not compile because of line `q2`.

C. The code does not compile because of line `q3`.

D. The code compiles, but a stack trace is printed at runtime.

52. (1 point) If an exception matches two or more catch blocks, which catch block is executed?

    A. The first one that matches is executed.

    B. The last one that matches is executed.

    C. All matched blocks are executed.

    D. It is not possible to write code like this.

53. (1 point) What is the output of the following application?

```java
package system;
public class Computer {
    public void compute() throws Exception {
        throw new RuntimeException("Error processing request");
    }
    public static void main(String[] bits) {
        try {
            new Computer().compute();
            System.out.print("Ping");
        } catch (NullPointerException e) {
            System.out.print("Pong");
            throw e;
        }
    }
}
```

    A. `Ping`

    B. `Pong`

    C. The code does not compile.

    D. The code compiles but throws an exception at runtime.

54. (1 point) In the following application, the value of list has been omitted. Assuming the code compiles without issue, which one of the following is not a possible output of executing this class?

```java
package checkboard;

public class Attendance {
    private Boolean[] list = // value omitted
    public int printTodaysCount() {
        int count=0;
        for(int i=0; i<10; i++) {
            if(list[i]) ++count;
        }
        return count;
    }
    public static void main(String[] roster) {
        new Attendance().printTodaysCount();
    }
}
```

A. A stack trace for `NullPointerException` is printed.

B. A stack trace for `ArrayIndexOutOfBoundsException` is printed.

C. A stack trace for `ClassCastException` is printed.

D. None of the above

55. (1 point) Fill in the blanks: A *blank* occurs when a program recurses too deeply into an infinite loop, while a(n) *blank* occurs when a reference to a nonexistent object is acted upon.

A. `NoClassDefFoundError, StackOverflowError`

B. `StackOverflowError, NullPointerException`

C. `ClassCastException, IllegalArgumentException`

D. `StackOverflowError, IllegalArgumentException`

56. (1 point) Which of the following is not a reason to add checked exceptions to a method signature?

A. To force a caller to handle or declare its exceptions

B. To notify the caller of potential types of problems

C. To ensure that exceptions never cause the application to terminate

D. To give the caller a chance to recover from a problem

57. (1 point) What is the output of the following?

```
String[] array = {"Natural History", "Science"};
List<String> museums = Arrays.asList(array);
museums.set(0, "Art");
System.out.println(museums.contains("Art"));
```

A. `true`

B. `false`

C. The code does not compile.

D. The code compiles but throws an exception at runtime.

58. (1 point) Which is a true statement?

A. If `s.contains("abc")` is `true`, then `s.equals("abc")` is also `true`.

B. If `s.contains("abc")` is `true`, then `s.startsWith("abc")` is also `true`.

C. If `s.startsWith("abc")` is `true`, then `s.equals("abc")` is also `true`.

D. If `s.startsWith("abc")` is `true`, then `s.contains("abc")` is also `true`.

59. (1 point) What is the output of the following?

```
List<Character> chars = new ArrayList<>();
chars.add(’a’);
chars.add(’b’);
chars.set(1, ’c’);
chars.remove(0);
System.out.print(chars.length());
```

A. `0`

B. `1`

C. `2`

D. None of the above

60. (1 point) The author of this method forgot to include the data type. Which of the following reference types can fill in the blank to complete this method?

```
public static void secret(/*YourAnswer*/ mystery) {
    mystery = mystery.replace("1", "8");
    mystery.startsWith("paper");
    String s = mystery.toString();
}
```

A. `ArrayList`

B. `String`

C. `StringBuilder`

D. None of the above