1. (1 point) Which of the following statements about Java is true?

   A. Java is a procedural programming language.

   B. Java allows method overloading.

   C. Java allows operator overloading.

   D. Java allows direct access to objects in memory.

2. (1 point) Given the following code, what values inserted in order into the blank lines, allow the code to compile?

```
/*INSERT CODE HERE*/ agen t ;
p u bli c /*INSERT CODE HERE*/ Banker {
    p r i v a t e s t a t i c // INSERT CODE HERE getMaxWithdrawal ( ) { r e t
        u r n 1 0;
    }
}
```

   A. import, class, null

   B. import, interface, void

   C. package, int, int

   D. package, class, long

3. (1 point) What is the output of the following application?

```
p u bli c c l a s s Ai r pla n e {
    s t a t i c i n t s t a r t = 2 ;
    f i n a l i n t end ;
    p u bli c Ai r pla n e ( i n t x ) {
        x = 4 ;
        end = x ;
    }
    p u bli c void f l y ( i n t di s t a n c e ) {
        System . out . p r i n t ( end-s t a r t +" " ) ;
        System . out . p r i n t ( di s t a n c e ) ;
    }
    p u bli c s t a t i c void main ( S t ri n g . . . s t a r t ) {
        new Ai r pla n e (10 ) . f l y ( 5 ) ;
    }
}
```

   A. 2 5

   B. 8 5

   C. 6 5

   D. The code does not compile.

4. (1 point) What is one of the most important reasons that Java supports extending classes via inheritance?

A. Inheritance requires that a class that extends another class be in the same package.

B. The program must spend extra time/resources at runtime jumping through multiple layers of inheritance to determine precise methods and variables.

C. Method signature changes in parent classes may break subclasses that use overloaded methods.

D. Developers minimise duplicate code in new classes by sharing code in a common parent class.

5. (1 point) Which of the following is a valid code comment in Java? A. //////// Walk my dog

B. #! Go team!

C. / Process fails at runtime /

D. None of the above

6. (1 point) Which of the following method signatures is not a valid declaration of an entry point in a Java application?

A. public static void main(String... arguments)

B. public static void main(String arguments)

C. public static final void main(String[] arguments)

D. public static void main(String[] arguments)

7. (1 point) Given the file Magnet.java below, which of the marked lines can you indepen dently insert the line public String color; into and still have the code compile?

```
// l i n e a1
p u bli c c l a s s Magnet {
        // l i n e a2
        p u bli c void a t ta c h ( ) {
                // l i n e a3
        }
        // l i n e a4
}
```

A. a1 and a3

B. a2 and a4

C. a2, a3, and a4

D. a1, a2, a3, and a4

8. (1 point) What is required to define a valid Java class file?

A. A class declaration

B. A package statement

C. At least one import statement

D. The public modifier

9. (1 point) What is the proper filename extension for a Java source file? A. .jav

B. .class

C. .source

D. .java

10. (1 point) Given that a Math class exists in both the java.lang and pocket.complex pack ages, what is the result of compiling the following class?

```
package pocke t ;
import poc ke t . complex . * ;
import ja va . u t i l . * ;
p u bli c c l a s s C al c ul a t o r {
        p u bli c s t a t i c void main ( S t ri n g [ ] a rg s ) {
                System . out . p r i n t (Math . f l o o r ( 5 ) ) ;
        }
}
```

A. The code does not compile because of line 2.

B. The code does not compile because of line 3.

C. The code does not compile because of line 6.

D. The code compiles without issue.

11. (1 point) Given a class that uses the following import statements, which class would not be automatically accessible within the class without using its full package name?

```
import dog . * ;
import dog . puppy . * ;
```

A. dog.puppy.female.KC

B. dog.puppy.Georgette

C. dog.Webby

D. java.lang.Object

12. (1 point) Which is the technique of structuring programming data as a unit consisting of attributes, with actions defined on the unit.

A. Encapsulation

B. Object orientation

C. Platform independence

D. Polymorphism

13. (1 point) Given the following class definition, what is the maximum number of import statements that can be discarded and still have the code compile? For this question, assume that the Broccoli class is in the food.vegetables package, and the Apple class is the food.fruit package.

```
package food ;
import food . v e g e t a bl e s . * ;
import food . f r u i t . * ;
import ja va . u t i l . Date ;

p u bli c c l a s s Grocery {
      Apple a ; B r o c c o l i b ; Date c ;
}
```

A. 0

B. 1

C. 2

D. 3

14. (1 point) Given the following application, what is the expected output?

```
p u bli c c l a s s Keyboard {
      p r i v a t e boolean numLock = t r u e ;
      s t a t i c boolean capLock = f a l s e ;
      p u bli c s t a t i c void main ( S t ri n g . . . s h o r t c u t s ) {
            System . out . p r i n t ( numLock+" "+capLock ) ;
      }
}
```

A. true false

B. false false

C. It does not compile.

D. It compiles but throws an exception at runtime.

15. (1 point) What is the result of compiling and executing the following class?

```
p u bli c c l a s s R oll e r S k a t e s {
      s t a t i c i n t wheel s = 1 ;
      i n t t r a c k s = 5 ;
      p u bli c s t a t i c void main ( S t ri n g [ ] arguments ) {
            R oll e r S k a t e s s = new R oll e r S k a t e s ( ) ;
```

```
        int feet=4, tracks = 15;
        System . out . print ( feet + tracks + s . wheels ) ;
```



```
    }
}
```

A. The code does not compile.

B. 5

C. 10

D. 20

16. (1 point) What is the result of compiling and executing the following class?

```
package sports ;
public class Bicycle {
    String color = " red " ;
    private void printColor ( String color ) {
        color = " purple " ;
        System . out . print ( color ) ;
    }
    public static void main ( String [ ] rider ) {
        new Bicycle ( ) . printColor (" blue " ) ;
    }
}
```

A. red

B. purple

C. blue

D. It does not compile.

17. (1 point) Which statements about calling the compilation command javac and the exe cution command java are true?

1. java may use a period . to separate packages.
2. javac takes a .java file and returns a .class file.
3. java may use a slash (/) to separate packages.

A. 1 only

B. 2 only

C. 1 and 2

D. 1, 2, and 3

18. (1 point) What is the result of compiling and executing the following application?

```
package f o r e c a s t ;
p u bli c c l a s s Weather {
        p r i v a t e s t a t i c boolean heatWave = t r u e ;
        p u bli c s t a t i c void main ( ) {
```



```
            boolean heatWave = f a l s e ;
            System . out . p r i n t ( heatWave ) ;
        }
}
```

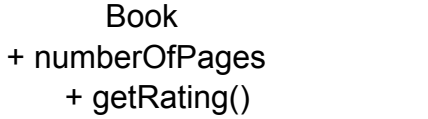
A. true

B. false

C. It does not compile.

D. It compiles but throws an error at runtime.

19. (1 point) Given the following class diagram, which Java implementation most closely matches this



A. \

```
p u bli c c l a s s Book {
        p u bli c i n t numOfPages ;
```

B.

```
p u bli c c l a s s Book {
          p u bli c S t ri n g g e tRa ti ng ( ) { r e t u r n n u l l ; } }
```

C.

```
p u bli c c l a s s Book {
        p u bli c i n t numberOfPages ;
          p u bli c S t ri n g g e tRa ti ng ( ) { r e t u r n n u l l ; } }
```

D.

```
p u bli c c l a s s Book {
        void numberOfPages ; }
```

20. (1 point) Which statement about the JVM is true?

A. The JVM schedules garbage collection on a predictable schedule.

B. The JVM ensures that the application will always terminate.

C. The JVM requires a properly defined entry point method to execute the ap plication.

D. A Java compiled code can be run on any computer.

21. (1 point) Which two primitives have wrapper classes that are not merely the name of the primitive with an uppercase letter?

A. byte and char

B. byte and int

C. char and int

D. None of the above

22. (1 point) Which of the following is true about String instance

variables? A. They can be set to null.

B. They can never be set from outside the class they are defined in.

C. They can only be set in the constructor.

D. They can only be set once per run of the program.

23. (1 point) Which statement is true about primitives?

A. Primitive types begin with a lowercase letter.

B. Primitive types can be set to null.

C. String is a primitive.

D. You can create your own primitive types.

24. (1 point) How do you force garbage collection to occur at a certain

point? A. Call System.forceGc()

B. Call System.gc()

C. Call System.requireGc()

D. None of the above

25. (1 point) How many of the String objects are eligible for garbage collection right before the end of the main method?

```
p u bli c s t a t i c void main ( S t r i n g [ ] f r u i t s ) {
    S t ri n g f r u i t 1 = new S t ri n g (" a p ple " ) ;
    S t ri n g f r u i t 2 = new S t ri n g (" o range " ) ;
    S t ri n g f r u i t 3 = new S t ri n g (" pea r " ) ;

    f r u i t 3 = f r u i t 1 ;
    f r u i t 2 = f r u i t 3 ;
    f r u i t 1 = f r u i t 2 ;
```

```
}
```

A. None

B. One

C. Two

D. Three

26. (1 point) Which of the following can fill in the blanks to make this code compile?

```
/*YourAnswer1 */ d = new /*YourAnswer1 */ (1 _000_000 . 0 0 ) ;
```

A. double, double

B. double, Double

C. Double, double

D. None of the above

27. (1 point) What does the following output?

```
p u bli c c l a s s I ni tO r d e r {
    p u bli c S t ri n g f i r s t = " i n s t a n c e " ;
    p u bli c I ni tO r d e r ( ) {
        f i r s t = " c o n s t r u c t o r " ;
    }
    { f i r s t = " blo c k " ; }
    p u bli c void p r i n t ( ) {
        System . out . p r i n t l n ( f i r s t ) ;
    }
    p u bli c s t a t i c void main ( S t ri n g . . . a rg s ) {
        new I ni tO r d e r ( ) . p r i n t ( ) ;
    }
}
```

A. block

B. constructor

C. instance

D. The code does not compile.

28. (1 point) How many of the following lines compile?

```
i n t i = n u l l ;
I n t e g e r i n = n u l l ;
S t ri n g s = n u l l ;
```

A. None

B. One

C. Two

D. Three

29. (1 point) Which pairs of statements can accurately fill in the blanks in this table?

Variable Type	Can be called within the class from what type of method
Instance	Blank 1: _____
Static	Blank 2: _____

A. Blank 1: an instance method only, Blank 2: a static method only B. Blank 1: an instance or static method, Blank 2: a static method only C. Blank 1: an instance method only, Blank 2: an instance or static method D. Blank 1: an instance or static method, Blank 2: an instance or static method

30. (1 point) Which of the following does not compile?

A. double num = 2.718;

B. double num = 2._718;

C. double num = 2.7_1_8;

D. None of the above; they all compile

31. (1 point) Which of the following lists of primitive numeric types is presented in order from smallest to largest data type?

A. byte, short, int, long

B. int, short, byte, long

C. short, byte, int, long

D. short, int, byte, long

32. (1 point) Fill in the blank to make the code compile:

```
package animal ;
p u bli c c l a s s Cat {
    p u bli c S t ri n g name ;
    p u bli c s t a t i c void main ( S t ri n g [ ] meow) {
```

```
        Cat ca t = new Cat ( ) ;
        /*YourAnswer*/ = " Sa di e " ;
  }
}
```

A. cat.name

B. cat-name

C. cat.setName

D. cat[name]

33. (1 point) Which of the following is the output of this code, assuming it runs to comple tion?

```
package s t o r e ;
p u bli c c l a s s Toy {
    p u bli c void pla y ( ) {
        System . out . p r i n t (" play −") ;
    }
    p u bli c void f i n a l i z e r ( ) {
        System . out . p r i n t (" cl ean −") ;
    }
    p u bli c s t a t i c void main ( S t ri n g [ ] fun ) {
        Toy ca r = new Toy ( ) ;
        ca r . pla y ( ) ;
        System . gc ( ) ;
        Toy d o l l = new Toy ( ) ;
        d o l l . pla y ( ) ;
    }
}
```

A. play

B. play-play

C. play-clean-play

D. play-play-clean-clean

34. (1 point) Which is the most common way to fill in the blank to implement this method?

```
p u bli c c l a s s Pinguino {
    p r i v a t e double beakLength ;
    p u bli c s t a t i c void setBeakLength ( Penguin p , i n t b ) {
        /*INSERT CODE HERE*/
    }
}
```

A. p.beakLength = b;

B. p['beakLength'] = b;

C. p[beakLength] = b;

D. None of the above

35. (1 point) Fill in the blanks to indicate whether a primitive or wrapper class can be assigned without the compiler using the autoboxing feature.

```
/*YourAnswer1 */ f i r s t = I n t e g e r . p a r s e I n t ("5" ) ;
/*YourAnswer1 */ second = I n t e g e r . valueOf ("5" ) ;
```


A. int, int

B. int, Integer

C. Integer, int

D. Integer, Integer

36. (1 point) How many objects are eligible for garbage collection right before the end of the main method?

```
p u bli c c l a s s Person {
    p u bli c Person younge s tChild ;

    p u bli c s t a t i c void main ( S t ri n g . . . a rg s ) {
        Person el e n a = new Person ( ) ;
        Person diana = new Person ( ) ;
        el e n a . younge s tChild = diana ;
        diana = n u l l ;
        Person zoe = new Person ( ) ;
        el e n a . younge s tChild = zoe ;
        zoe = n u l l ;
    }
}
```

A. None

B. One

C. Two

D. Three

37. (1 point) Which is a valid constructor for this class?

```
p u bli c c l a s s T e n ni sBall {
}
```

A. public TennisBall static create() return new TennisBall();

B. public TennisBall static newInstance() return new TennisBall():

C. public TennisBall()

D. public void TennisBall()

38. (1 point) Which of the following is not a possible output of this code, assuming it runs to completion?

```
package s t o r e ;
p u bli c c l a s s Toy {
    p u bli c void pla y ( ) {
        System . out . p r i n t (" play −") ;
    }
```



```
    p u bli c void f i n a l i z e ( ) {
        System . out . p r i n t (" cl ean −") ;
     }
    p u bli c s t a t i c void main ( S t ri n g [ ] a rg s ) {
        Toy ca r = new Toy ( ) ;
        ca r . pla y ( ) ;
        System . gc ( ) ;
        Toy d o l l = new Toy ( ) ;
        d o l l . pla y ( ) ;
    }
}
```

A. play

B. play-play

C. play-play-clean

D. play-play-clean-clean

39. (1 point) Which converts a primitive to a wrapper class object without using autoboxing?

A. Call the asObject() method

B. Call the constructor of the wrapper class

C. Call the convertToObject() method

D. Call the toObject() method

40. (1 point) What is the output of the following?

```
package beach ;
p u bli c c l a s s Sand {
    p u bli c Sand ( ) {
        System . out . p r i n t (" a " ) ;
```

```
    }
    p u bli c void Sand ( ) {
        System . out . p r i n t (" b " ) ;
    }
    p u bli c void run ( ) {
        new Sand ( ) ;
        Sand ( ) ;
    }
    p u bli c s t a t i c void main ( S t ri n g . . . a rg s ) {
        new Sand ( ) . run ( ) ;
    }
}
```

A. a

B. ab

C. aab

D. None of the above

41. (1 point) What is the output of the following application?

```
package bob ;
p u bli c c l a s s AreYouBob {
    p u bli c s t a t i c void main ( S t ri n g [ ] unused ) {
    S t ri n g bob = new S t ri n g (" bob " ) ;
    S t ri n g notBob = bob ;
    System . out . p r i n t ( ( bob==notBob )+" "+(bob . ( notBob ) ) ) ; }
}
```

A. true true

B. true false

C. false true

D. false false

42. (1 point) What is the value of 12 + 6 * 3 % (1 + 1) in Java?

A. 0

B. 12

C. 14

D. None of the above

43. (1 point) Given the following truth table, the boolean variables p and q, and the ex pression $p \wedge q$, what are the missing values in the truth table, starting with the first column?

p = true p = false
q = true false true
q = false

A. false and true

B. false and false

C. true and true

D. true and false

44. (1 point) Which of the following is not a possible result of executing the following ap plication?


```
p u bli c c l a s s C o n d i t i o n a l l y L o g i c a l {
    p u bli c s t a t i c void main ( S t ri n g . . . data ) {
        i f ( data . leng th >=1
                && ( data [ 0 ] . e q u al s (" sound " ) | | data [ 0 ] . e q u al s
                    (" l o g i c " ) )
                && data . leng th <2) {
            System . out . p r i n t ( data [ 0 ] ) ;
        }
    }
}
```

A. Nothing is printed

B. sound is printed

C. The application throws an exception at runtime

D. logic is printed

45. (1 point) Fill in the blanks: The operators +,*blank1* , *blank2* , *blank3*, and ++ are listed in the same or increasing level of operator precedence.

A. *, - -, /

B. %, -, *

C. /, *, %

D. *, -, /

46. (1 point) What statement about the ˆ operator is correct?

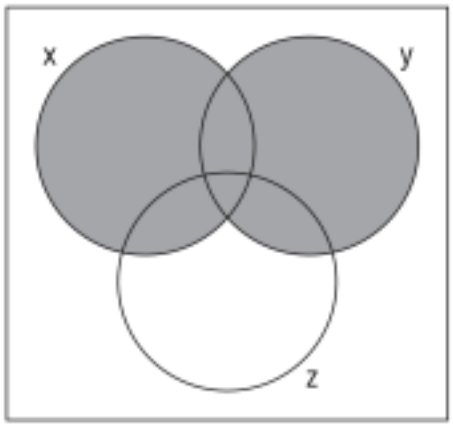
A. If one of the operands of ˆ is true, then the result is always true.

B. There is a conditional form of the operator, denoted as ˆˆ.

C. If both operands of ˆ are true, the result is true.

D. The ˆ operator can only be applied to boolean values.

47. (1 point) Given the following Venn diagram and the variables, x, y, and z, which Java expression most closely represents the filled-in region of the diagram?



A. x || z

B. y || (y && z)

C. x || y

D. y && x

48. (1 point) What variable type of red allows the following application to compile?

```
package to rnado ;
p u bli c c l a s s Kansas {
      p u bli c s t a t i c void main ( S t ri n g [ ] a rg s ) {
            i n t colorOfRainbow = 1 0;
            /∗YourAnswer∗/ red = 5 ;
            swi t c h ( colorOfRainbow ) {
```

```
                d ef a u l t :
                    System . out . p r i n t ("Home" ) ;
                    b reak ;
            ca s e red :
                System . out . p r i n t ("Away" ) ;
            }
        }
    }
```

A. long

B. double

C. int

D. None of the above

49. (1 point) Which two operators would be used to test if a number is equal to or greater than 5.21 but strictly less than 8.1?

A. > and <=

B. >= and >

C. < and >=

D. < and >

50. (1 point) What is the output of the following application?

```
package t r a n s p o r t e r ;
p u bli c c l a s s TurtleVsHare {
    p u bli c s t a t i c void main ( S t ri n g [ ] arguments ) {
        i n t t u r t l e = 10 ∗ (2 + (3 + 2 ) / 5 ) ;
        i n t ha re = t u r t l e < 5 ? 10 : 2 5;
        System . out . p r i n t ( t u r t l e < ha re ? "Hare wins ! " : " T u r tl e wins
            ! " ) ;
    }
}
```

A. Hare wins!

B. Turtle wins!

C. The code does not compile.

D. The code compiles but throws a division by zero error at

runtime. 51. (1 point) What is the output of the following application?

```
p u bli c c l a s s Coun tEn t rie s {
    p u bli c s t a t i c i n t g e t R e s ul t ( i n t t h r e s h ol d ) {
```

```
        return threshold > 5 ? 1 : 0;
    }
    public static final void main ( String [] days ) {
        System . out . print ( getResult ( 5 )+getResult ( 1 )
            +getResult ( 0 )+getResult ( 2 ) +"") ;
    }
}
```

A. 0

B. 1

C. 0000

D. 1000

52. (1 point) What is the output of the following application?

```
package yoyo ;
public class TestGame {
    public String runTest ( boolean spinner , boolean roller ) { if ( s
        pinner = roller ) return "up " ;
```



```
        else return roller ? "down" : " middle " ;
    }
    public static final void main ( String pieces [] ) {
        final TestGame tester = new TestGame ( ) ;
      System . out . println ( tester . runTest ( false , true ) ) ;
    }
}
```

A. up

B. middle

C. down

D. The code does not compile.

53. (1 point) Fill in the blanks: The *blank* operator is true if either of the operands are true, while the *blank* operator flips a boolean value.

A. +, -

B. &&, !

C. |, -

D. ||, !

54. (1 point) Given the following code snippet, what is the value of movieRating after it is executed?

```
int characters = 5 ;
```

```
i n t s t o r y = 3 ;
double movieRating = c h a r a c t e r s <= 4 ? 3 : s to r y >1 ? 2 : 1 ;
```

A. 2.0

B. 3.0

C. The code does not compile but would compile if parentheses were adde D.

E. None of the above

55. (1 point) Fill in the blanks: A switch statement can have *blank* case statements and *blank* default statements.

A. at most one, at least one

B. any number of, at most one

C. at least one, any number of

D. at least one, at most one

56. (1 point) Which of the following is not a possible result of executing the following ap plication?


```
p u bli c c l a s s O u t si d eLogi c {
    p u bli c s t a t i c void main ( S t ri n g . . . weather ) {
        System . out . p r i n t ( weather [ 0 ] ! = n u l l
                && weather [ 0 ] . e q u al s (" sunny " )
                && ! f a l s e
               ? "Go Ou t side " : " Stay I n s i d e " ) ;
    }
}
```

A. Nothing is printe

B.

C. The application throws an exception at runtime.

D. Go Outside is printe

E.

F. Stay Inside is printe

G.

57. (1 point) What is the value of (5 + (!2 + 8) * 3 - 3 % 2)/2 in Java?

A. 2

B. 11

C. 16

D. None of the above

58. (1 point) Given the following truth table, the boolean variables w and z, and the ex pression w || z, what are the missing values in the truth table, starting with the first row?

	w = true	w = false
z = true	true	
z = false	false	

A. false and false

B. true and false

C. true and true

D. false and true

59. (1 point) Fill in the blanks: The operators –, *blank*, *blank*, *blank*, and % are listed in the same or increasing level of operator precedence.

A. +, /, *

B. - -, -, *

C. ++, /, *

D. *, ++, %

60. (1 point) What is the output of the following application?

```
p u bli c s t a t i c S t ri n g pla y ( i n t toy , i n t age ) { f i n
      a l S t ri n g game ;
      i f ( toy <2)
            game = age > 1 ? 1 : 1 0; // p1
      e l s e
                  game = age > 3 ? " B all " : "Swim " ; // p2
      r e t u r n game ;
}
p u bli c s t a t i c void main ( S t ri n g [ ] v a r i a b l e s ) {
      System . out . p r i n t ( pla y ( 5 , 2 ) ) ;
}
}
```

A. Ball

B. Swim

C. The code does not compile due to p1.

D. The code does not compile due to p2.

https://docs.google.com/forms/d/e/1FAIpQLScGeT4J_gSGZXxXIIpSvKQ3DZDpkHxGJh6QrQ7DVxDh8xIs4g/viewscore?viewscore=AE0zAgAhkX-UWYNwYdVWc5il5iqXs9TwqXNLQwui_0iwsKtEZYDiGFwhBhyv82Ts6A (Answers)