Package Title: Test Bank
Course Title: Big Java, Late Objects
Chapter Number: 2 Fundamental Data Types

Question type: Multiple Choice

1) Which of the following options declares a `float` variable?

a) `Float age;`
b) `flt age;`
c) `float age;`
d) `age: float;`

Answer: c

Title: Which declares a `float` variable?
Difficulty: Easy
Section Reference 1: 2.1 Variables
Section Reference 2: Special Topic 2.1

2) What is the result of the following code snippet?

```
public static void main(String[] args)
{
   double circleRadius;
   double circleVolume = 22 / 7 * circleRadius * circleRadius;
   System.out.println(circleVolume);
}
```

a) 0
b) 3.14
c) 6.28
d) compile-time error

Answer: d

Title: What is result of snippet (with assignment)?
Difficulty: Medium
Section Reference 1: 2.1 Variables

3) What is wrong with the following code snippet?

```
public class Area
{
```



```
   public static void main(String[] args)
   {
      int width = 10;
      height = 20.00;
      System.out.println("area = " + (width * height));
   }
}
```

a) The code snippet uses an uninitialized variable.
b) The code snippet uses an undeclared variable.
c) The code snippet attempts to assign a decimal value to an integer variable.
d) The code snippet attempts to add a number to a string variable.

Answer: b

Title: What is wrong with snippet (with variable error)?
Difficulty: Medium
Section Reference 1: 2.1 Variables

4) What is wrong with the following code snippet?

```
int average;
average = 78A;
```

a) The `average` variable is never initialized.
b) The data type for the `average` variable is not specified.
c) The `average` variable is never assigned a value.
d) The `average` variable is assigned a non-numeric value.

Answer: d

Title: What is wrong with snippet (with value assigned to variable)?
Difficulty: Medium
Section Reference 1: 2.1 Variables

5) Which of the following guidelines will make code more explanatory for others?

a) Use more statements in source code.
b) Add comments to source code.
c) Avoid usage of complex calculations in source code.
d) Always enclose the statements in curly braces in source code.

Answer: b

Title: Which of the following guidelines will make code more explanatory for others?
Difficulty: Easy

Section Reference 1: 2.1 Variables

6) What will be the value stored in the variable `x` after the execution of the following code snippet?

```
int a = 10;
int b = 20;
int c = 2;
int x = b / a /*c*/;
```

a) 1
b) 2
c) 4
d) The code has a syntax error

Answer: b

Title: What is output of snippet (with arithmetic expression)?
Difficulty: Medium
Section Reference 1: 2.1 Variables

7) Which of the following statements with comments is(are) valid?

I. `int cnt = 0; /* Set count to 0`
II. `int cnt = 0; /* Set count to 0 */`
III. `int cnt = 0; // Set count to 0`

a) Only I is valid
b) I and II are valid
c) II and III are valid
d) Only III is valid

Answer: c

Title: Which statement has good comments?
Difficulty: Medium
Section Reference 1: 2.1 Variables

8) What is wrong with the following code?

```
int count = 2000 * 3000 * 4000;
```

a) Wrong data type
b) Variable is undefined
c) Integer overflow

d) Illegal expression

Answer: c

Title: What's wrong with integer expression?
Difficulty: Medium
Section Reference 1: 2.1 Variables
Section Reference 2: Common Error 2.2

9) Which one of the following variables is assigned with valid literals?

a)
```
int salary = 0;
salary = 5000.50;
```
b)
```
int salary1 = 0;
salary1 = 1.2E6;
```
c)
```
double salary2 = 0;
salary2 = 2.96E-2;
```
d)
```
long salary3 = 0;
salary3 = 1E-6;
```

Answer: c

Title: Which variable is assigned with valid literals?
Difficulty: Medium
Section Reference 1: 2.1 Variables

10) What will be the value inside the variables `a` and `b` after the given set of assignments?

```
int a = 20;
int b = 10;
a = (a + b) / 2;
b = a;
a++;
```

a) a = 15, b = 16
b) a = 16, b = 16
c) a = 16, b = 15
d) a = 15, b = 15

Answer: c

Title: What is the value of `a` and `b` after these assignments?
Difficulty: Medium

Section Reference 1: 2.2 Arithmetic

11) What is the value inside the `value` variable at the end of the given code snippet?

```
public static void main(String[] args)
{
   int value = 3;
   value = value - 2 * value;
   value++;
}
```

a) –2
b) 0
c) 2
d) 4

Answer: a

Title: What is `value` after this snippet (with assignment and increment)?
Difficulty: Easy
Section Reference 1: 2.2 Arithmetic

12.) What are the values of `num1` and `num2` after this snippet executes?

```
double num1 = 4.20;
double num2 = num1 * 10 + 5.0;
```

a) num1 = 4.20 and num2 = 42.0
b) num1 = 4.20 and num2 = 47.0
c) num1 = 42.0 and num2 = 42.0
d) num1 = 42.0 and num2 = 47.0

Answer: b

Title: What are `num1` and `num2` after snippet (with assignment)?
Difficulty: Medium
Section Reference 1: 2.2 Arithmetic

13) What is the result of the following expression?

```
double d = 2.5 + 4 * -1.5 - (2.5 + 4) * -1.5;
```

a) 24.375
b) 6.25
c) 12.375
d) 6

Answer: b

Title: What is the result of (arithmetic) expression?
Difficulty: Hard
Section Reference 1: 2.3 Input and Output

14) What is the output of the following code snippet?

```
public static void main(String[] args)
{
   int value = 3;
   value++;
   System.out.println(value);
}
```

a) 2
b) 3
c) 4
d) No output due to syntax error

Answer: c

Title: What is output of snippet (with increment)?
Difficulty: Easy
Section Reference 1: 2.2 Arithmetic

15) What is the output of the following code snippet?

```
public static void main(String[] args)
{
   int value = 25;
   value = value * 2;
   value--;
   System.out.println(value);
}
```

a) 25
b) 50
c) 49
d) 26

Answer: c

Title: What is output of snippet (with decrement)?
Difficulty: Easy
Section Reference 1: 2.2 Arithmetic

16) Assuming that the user inputs a value of 25 for the price and 10 for the discount rate in the following code snippet, what is the output?

```
public static void main(String[] args)
{
   Scanner in = new Scanner(System.in);
   System.out.print("Enter the price: ");
   double price = in.nextDouble();
   System.out.print("Enter the discount rate: ");
   double discount = in.nextDouble();
   System.out.println("The new price is " +
       price - price * (discount / 100.0));
}
```

a) The new price is 25
b) The new price is 15
c) The new price is 22.5
d) The new price is 20.0

Answer: c

Title: What is output of snippet (that calculates value based on user input)?
Difficulty: Medium
Section Reference 1: 2.2 Arithmetic

17) Which of the following statements is correct about constants?

a) Constants are written using capital letters because the compiler ignores constants declared in small letters.
b) The data stored inside a constant can be changed using an assignment statement.
c) You can make a variable constant by using the `final` reserved word when declaring it.
d) Constant variables can only be changed through the Math library.

Answer: c

Title: Which statement is correct about constants?
Difficulty: Medium
Section Reference 1: 2.1 Variables

18) Which one of the following operators computes the remainder of an integer division?

a) `/`
b) `%`
c) `\`

d) `!`

Answer: b

Title: Which operator computes the remainder of an integer division?
Difficulty: Easy
Section Reference 1: 2.2 Arithmetic

19) What is the value of `Math.pow(3, 2)`?

a) 6
b) 9
c) 8
d) 5

Answer: b

Title: What is the value of `Math.pow(3, 2)`?
Difficulty: Easy
Section Reference 1: 2.2 Arithmetic

20) What is the output of the following code snippet?

```
public static void main(String[] args)
{
   double a;
   a = Math.sqrt(9.0) + Math.sqrt(16.0);
   System.out.println(a);
}
```

a) 25.0
b) 337.0
c) 7.0
d) 19.0

Answer: c

Title: What is output of snippet (with Math.sqrt())?
Difficulty: Medium
Section Reference 1: 2.2 Arithmetic

21) Which is the Java equivalent of the following mathematical expression?

$c = \sqrt{(a^2 + b^2)}$

a) `c = Math.sqrt(a * 2 + b * 2);`
b) `c = Math.sqrt(a * 2) + Math.sqrt(b * 2);`
c) `c = Math.sqrt(Math.pow(a, 2) + Math.pow(b, 2));`
d) `c = Math.sqrt(Math.pow(a, 2)) + Math.sqrt(Math.pow(b, 2));`

Answer: c

Title: TB 2.10 Which is the Java equivalent of this mathematical expression?
Difficulty: Medium
Section Reference 1: 2.2 Arithmetic

22) Which one of the following is a correct representation of the given mathematical expression in Java?

$$\frac{a + b}{2}$$

a) `a + b % 2`
b) `a + b / 2`
c) `a + (b / 2)`
d) `(a + b) / 2`

Answer: d

Title: Which is the Java equivalent of this mathematical expression?
Difficulty: Easy
Section Reference 1: 2.2 Arithmetic

23) Which of the following is the Java equivalent of the following mathematical expression?

$c = 2\pi \cdot radius$

a) `c = 2 * Math.PI * radius * 2;`
b) `c = 2 * Math.PI * Math.pow(2, radius);`
c) `c = 2 * Math.PI * Math.pow(radius, 2);`
d) `c = 2 * Math.PI * radius;`

Answer: d

Title: Which is the Java equivalent of this mathematical expression?
Difficulty: Medium
Section Reference 1: 2.2 Arithmetic

24) What is the result of the following statement?


```
String s = "You" + "had" + "me" + "at" + "hello";
```

a) The string s has the following value: `"You had me at "hello"`
b) The statement results in an error because the `+` operator can be used only with numbers
c) The statement results in an error because the `+` operation cannot be performed on string literals
d) The string `s` has the following value: `"Youhadmeathello"`

Answer: d

Title: What is result of statement (that uses + with strings)?
Difficulty: Medium
Section Reference 1: 2.5 Strings

25) Which operator is used to concatenate two or more strings?

a) `+`
b) `%`
c) `&`
d) `^`

Answer: a

Title: Which operator is used to concatenate two or more strings?
Difficulty: Easy
Section Reference 1: 2.5 Strings

26) What output is produced by these statements?

```
String name = "Joanne Hunt";
System.out.println(name.length());
```

a) 8
b) 10
c) 9
d) 11

Answer: d

Title: What output is produced by (sending string length to output)?
Difficulty: Medium
Section Reference 1: 2.5 Strings

27) How do you compute the length of the string `str`?

a) `length(str)`
b) `length.str`
c) `str.length`
d) `str.length()`

Answer: d

Title: How do you compute the length of the string `str`?
Difficulty: Medium
Section Reference 1: 2.5 Strings

28) What is the output of the following code snippet?

```
public static void main(String[] args){
{
   String str1;
   str1 = "I LOVE MY COUNTRY";
   String str2 = str1.substring(4, 9);
   System.out.println(str2);
}
```

a) I LOV
b) OVE M
c) V
d) VE MY

Answer: d

Title: What is output of snippet (with substring)?
Difficulty: Medium
Section Reference 1: 2.5 Strings

29) What is the output of the following code snippet?

```
public static void main(String[] args)
{
   int s;
   double f = 365.25;
   s = f / 10;
   System.out.println(s);
}
```

a) 36
b) 36.525
c) 37
d) No output because the code snippet generates compilation errors

Answer: a

Title: What is output of snippet (with division)?
Difficulty: Medium
Section Reference 1: 2.2 Arithmetic

30) Assuming that the user inputs “Joe” at the prompt, what is the output of the following code snippet?

```
public static void main(String[] args)
{
   System.out.print("Enter your name ");
   String name;
   Scanner in = new Scanner(System.in);
   name = in.next();
   name += ", Good morning";
   System.out.print(name);
}
```

a) The code snippet does not compile because the += operator cannot be used in this context.
b) Joe, Good morning
c) , Good morning
d) Joe

Answer: b

Title: What is output of snippet (using += with string variable)?
Difficulty: Medium
Section Reference 1: 2.5 Strings

31) Which one of the following refers to a number constant that appears in code without explanation?

a) Constant
b) Variable
c) Magic number
d) String literal

Answer: c

Title: Which refers to a number constant that appears without explanation?
Difficulty: Easy
Section Reference 1: 2.1 Variables
Section Reference 2: Programming Tip 2.2

32) What happens to the fractional part when a division is performed on two integer variables?

a) The fractional part is rounded off to the nearest integer value.
b) The fractional part is discarded.
c) Two integers cannot be used in division; at least one of the operands should be a floating-point number.
d) Instead of using an integer division, you should use the modulus operator to perform floating-point division.

Answer: b

Title: What happens to the fractional part (in integer division)?
Difficulty: Medium
Section Reference 1: 2.2 Arithmetic

33) Consider the following division statements:

I. 22 / 7
II. 22.0 / 7
III. 22 / 7.0

Which of the following is correct?

a) All three statements will return an integer value.
b) Only I will return an integer value.
c) Only I, II will return an integer value.
d) Only I and III will return an integer value.

Answer: b

Title: Which is correct (about division statements)?
Difficulty: Medium
Section Reference 1: 2.2 Arithmetic

34) Which of the following options is valid with reference to the code snippet?

```
public static void main(String[] args)
{
   double d = 45.326;
   double r = d % 9.0;
   System.out.println(r);
}
```

a) The value inside the variable `r` will be 0.326
b) The value inside the variable `r` will be 5.036

c) Variable `r` has to be defined as an integer because the `%` operator always returns an integer
d) The initialization of variable `r` is wrong, because the `%` operator expects integer values as operands

Answer: a

Title: Which is valid for this snippet (using modulus)?
Difficulty: Medium
Section Reference 1: 2.2 Arithmetic

35) What is the output of the following code snippet?

```
public static void main(String[] args)
{
   int var1 = 10;
   int var2 = 2;
   int var3 = 20;
   var3 = var3 / (var1 % var2);
   System.out.println(var3);
}
```

a) 0
b) 4
c) 20
d) There will be no output due to a run-time error.

Answer: d

Title: What is output of snippet (using modulus)?
Difficulty: Hard
Section Reference 1: 2.2 Arithmetic

36) Which one of the following statements gives the absolute value of the floating-point number `x = -25.50`?

a) `abs(x);`
b) `Math.abs(x);`
c) `x.abs();`
d) `x.absolute();`

Answer: b

Title: Which statement gives the absolute value of this floating-point number?
Difficulty: Easy
Section Reference 1: 2.2 Arithmetic

37) Assuming that the user enters 45 and 62 as inputs for `n1` and `n2`, respectively, what is the output of the following code snippet?

```
public static void main(String[] args)
{
   System.out.print("Enter a number: ");
   Scanner in = new Scanner(System.in);
   String n1 = in.next();
   System.out.print("Enter another number: ");
   String n2 = in.next();
   String result = n1 + n2;
   System.out.print(result);
}
```

a) 46
b) 4662
c) 107
d) 4562

Answer: d

Title: What is output of snippet (that adds two numbers stored as strings)?
Difficulty: Medium
Section Reference: 2.5 Strings

38) Which of the methods below are static methods?

I. `length`
II. `substring`
III. `pow`
IV. `sqrt`

a) All the methods are static
b) Only I, II and III
c) Only II and IV
d) Only III and IV

Answer: d

Title: Which of these methods are static?
Difficulty: hard
Section Reference 1: 2.5 Strings
Section Reference 2: Special Topic 2.4

39) Which one of the following statements can be used to extract the last five characters from any string variable `str`?

a) `str.substring(str.length() - 5, str.length())`
b) `str.substring(5, 5)`
c) `str.substring(str.length() - 4, 5)`
d) `str.substring(str.length() - 5, 5)`

Answer: a

Title: Which statement extracts the last five characters from any string variable?
Difficulty: Hard
Section Reference 1: 2.5 Strings

40) Assuming that the user inputs a value of 25000 for the pay and 10 for the bonus rate in the following code snippet, what is the output?

```
public static void main(String[] args)
{
   Scanner in = new Scanner(System.in);
   System.out.print("Enter the pay: ");
   double pay = in.nextDouble();
   System.out.print("Enter the bonus rate: ");
   double bonus = in.nextDouble();

   System.out.println("The new pay is " +
      (pay + pay * (bonus / 100.0)));
}
```

a) The new pay is 25000
b) The new pay is 25100
c) The new pay is 27500
d) The new pay is 30000

Answer: c

Title: What is output of snippet (that calculates value based on user input)?
Difficulty: Medium
Section Reference 1: 2.3 Input and Output

41) What is the value of `Math.abs(-2)`?

a) -2
b) 0
c) 2
d) 4

Answer: c

Title: What is the value of `Math.abs(-2)`?
Difficulty: Easy
Section Reference 1: 2.2 Arithmetic

42) What is the output of the following code snippet?

```
public static void main(String[] args)
{
   double x;
   x = Math.pow(3.0, 2.0) + Math.pow(4.0, 2.0);
   System.out.println(x);
}
```

a) 25.0
b) 34
c) 7.0
d) 14

Answer: a

Title: What is output of snippet (with pow function)?
Difficulty: Medium
Section Reference 1: 2.2 Arithmetic

43) Which is the Java equivalent of the following mathematical expression?
$c = (\sqrt{a} + \sqrt{b})^2$

a) `c = Math.sqrt(a * 2 + b * 2);`
b) `c = Math.sqrt(a * 2) + Math.sqrt(b * 2);`
c) `c = Math.sqrt(pow(a, 2) + Math.pow(b, 2));`
d) `c = Math.pow((Math.sqrt(a) + Math.sqrt(b)), 2);`

Answer: d

Title: Which is the Java equivalent of this mathematical expression?
Difficulty: Medium
Section Reference 1: 2.2 Arithmetic

44) Which of the following is the Java equivalent of the following mathematical expression?
$p = 2 \cdot \pi \cdot (radius)^3$

a) `p = 2 * Math.PI * (radius * 3);`
b) `p = Math.PI * Math.pow(3, radius);`

c) `p = 2 * Math.PI * Math.pow(radius, 3);`
d) `p = 2 * Math.pow(Math.PI * radius, 3);`

Answer: c

Title: Which is the Java equivalent of this mathematical expression?
Difficulty: Medium
Section Reference 1: 2.2 Arithmetic

45) How do you extract the first 5 characters from the string `str`?

a) `substring(str, 5)`
b) `substring.str(0, 5)`
c) `str.substring(5)`
d) `str.substring(0, 5)`

Answer: d

Title: How do you extract the first 5 characters from the string `str`?
Difficulty: Medium
Section Reference 1: 2.5 Strings

46) Which of the given `System.out.print` statements generates the following output?

```
ABCDE"\
```

a) `System.out.println("ABCDE\"\\");`
b) `System.out.println("ABCDE"\");`
c) `System.out.println("ABCDE"\);`
d) `System.out.println("ABCDE\"\");`

Answer: a

Title: Which System.out.print statement generates output with quote and backslash?
Difficulty: Medium
Section Reference 1: 2.5 Strings

47) Which of the given statements generates the following output?

```
\\\"///
```

a) `System.out.println("\\\"///");`
b) `System.out.println("\\\\\\\"///");`
c) `System.out.println("\\\\\\""//////");`

d) `System.out.println("\\\"///");`

Answer: b

Title: Which statement generates this output?
Difficulty: Hard
Section Reference 1: 2.5 Strings

48) What will be the value inside the variables `x` and `y` after the given set of assignments?

```
int x = 20;
int y = 10;
x = (x - y) * 2;
y = x / 2;
```

a) x = 40, y = 20
b) x = 20, y = 10
c) x = 10, y = 20
d) x = 20, y = 20

Answer: b

Title: What is the value of `x` and `y` after these assignments?
Difficulty: Medium
Section Reference 1: 2.2 Arithmetic

49) What is the value inside the `var` variable at the end of the given code snippet?

```
public static void main(String[] args)
{
   int var = 30;
   var = var + 2 / var;
   var++;
}
```

a) 0
b) 1
c) 30
d) 31

Answer: d

Title: What is `var` after this snippet (with assignment and increment)?
Difficulty: Easy
Section Reference 1: 2.2 Arithmetic

50) What is the output of the following code snippet?

```
public static void main(String[] args)
{
   int num1 = 10;
   int num2 = 5;
   int num3 = 200;
   num3 = num3 % (num1 * num2);
   System.out.println(num3);
}
```

a) 0
b) 4
c) 10
d) 250

Answer: a

Title: What is output of snippet (using modulus)?
Difficulty: Hard
Section Reference 1: 2.2 Arithmetic

51) Assuming that the user enters 23 and 45 as inputs for `num1` and `num2`, respectively, what is the output of the following code snippet?

```
public static void main(String[] args)
{
   Scanner in = new Scanner(System.in);
   System.out.print("Enter a number: ");
   String num1 = in.next();
   System.out.print("Enter another number: ");
   String num2 = in.next();
   System.out.println(num1 + num2);
}
```

a) 23
b) 4523
c) 68
d) 2345

Answer: d

Title: What is output of snippet (that adds two numbers stored as strings)?
Difficulty: Medium
Section Reference 1: 2.5 Strings

52) Which one of the following statements can be used to extract the last 10 characters from the string variable `str`?

a) `str.substring(str.length() - 10, str.length())`
b) `str.substring(10, str.length())`
c) `str.substring(str.length() - 9, 10)`
d) `str.substring(0, 10)`

Answer: a

Title: Which statement extracts the last 10 characters from the string variable `str`?
Difficulty: Hard
Section Reference 1: 2.5 Strings

53) Which one of the following statements can be used to convert a string `str` to a double?

a) `double n = str.parseDouble();`
b) `double n = Integer.parseDouble(str);`
c) `double n = Double.parseDouble(str);`
d) `double n = double.parseDouble(str);`

Answer: c

Title: Which statement converts string to double?
Difficulty: Medium
Section Reference 1: 2.5 Strings
Section Reference 2: Special Topic 2.5

54) Which one of the following statements can be used to get the fifth character from a string `str`?

a) `char c = str.charAt(5);`
b) `char c = str.charAt(4);`
c) `char c = str[5];`
d) `char c = str[4];`

Answer: b

Title: Which statement gets a character from a string ?
Difficulty: Medium
Section Reference 1: 2.5 Strings

55) Which one of the following statements displays the output as 54321.00?

a) `System.out.printf("%8.2f", 54321.0);`
b) `System.out.printf("%8,2f", 54321.0);`

c) `System.out.printf(",8.2f", 54321.0);`
d) `System.out.printf("%8.00f", 54321.0);`

Answer: a

Title: Which statement displays specified formatted output?
Difficulty: Medium
Section Reference 1: 2.3 Input and Output

56) Which one of the following statements displays the output as (1.23e+02)?

a) `System.out.printf("%(5.2e", -123.0);`
b) `System.out.printf("%5.2e", -123.0);`
c) `System.out.printf("^5.2e", -123.0);`
d) `System.out.printf("%5.2E", -123.0);`

Answer: a

Title: Which statement displays specified formatted output ?
Difficulty: Medium
Section Reference 1: 2.3 Input and Output

57) Which one of the following statements defines a constant with the value 123?

a) `final int MY_CONST = 123;`
b) `const int MY_CONST = 123;`
c)
```
final int MY_CONST;
MY_CONST = 123;
```
d) `static int MY_CONST = 123;`

Answer: a

Title: Which statement defines a constant?
Difficulty: Medium
Section Reference 1: 2.1 Variables

58) Which one of the following statements displays the output as +00321.00?

a) `System.out.printf("+%09.2f", 321.0);`
b) `System.out.printf("%009,2f", 321.0);`
c) `System.out.printf("+9.2f", 321.0);`
d) `System.out.printf("%09.00f", 321.0);`

Answer: a

Title: Which statement displays specified formatted output ?
Difficulty: Medium
Section Reference 1: 2.3 Input and Output

59) One way to avoid round-off errors is to use:

a) `Math.sqrt()`
b) `Math.pow()`
c) `Math.round()`
d) `Math.truncate()`

Answer: c

Title: What to use for rounding number?
Difficulty: Medium
Section Reference 1: 2.2 Arithmetic

60) What (if any) type of error occurs with the following code if the user input is ABC?

```
public static void main(String[] args)
{
   Scanner in = new Scanner(System.in);
   System.out.print("Enter a number: ");
   String str = in.next();
   int count = Integer.parseInt(str);
   System.out.println("Input is " + count);
}
```

a) Compile-time error
b) Run-time error
c) Overflow error
d) Illegal expression

Answer: b

Title: What type of error with code containing Integer.parseInt()?
Difficulty: Medium
Section Reference 1: 2.5 Strings
Section Reference 2: Special Topic 2.5

61) What does the following statement sequence print?

```
String str = "Harry";
int n = str.length();
```



```
String mystery = str.substring(0, 1) + str.substring(n - 2, n);
System.out.println(mystery);
```

a) Ha
b) Har
c) Hy
d) Hry

Answer: d

Title: Output of code snippet with substring
Difficulty: Medium
Section Reference 1: 2.5 Strings

62) What does the following statement sequence print?

```
String str = "Hello";
int n = str.length();
String mystery = str.substring(0, 1)
   + str.substring(n - 2, n + 1);
System.out.println(mystery);
```

a) Run-time error
b) He
c) Ho
d) Hry

Answer: a

Title: Output of code snippet with substring
Difficulty: Medium
Section Reference 1: 2.5 Strings

63) What does the following statement sequence print?

```
String str = "Java Is Good";
int n = str.length();
String mystery = str.substring(n - 4, n) +
   str.charAt(4) + str.substring(0, 4);
System.out.println(mystery);
```

a) Java
b) Good Java
c) Good
d) Is Good

Answer: b

Title: Output of code snippet with substring
Difficulty: Medium
Section Reference 1: 2.5 Strings

64) What does the following statement sequence print?

```
final String str = "Java";
str += " is powerful";
System.out.println(str);
```

a) Java is powerful
b) Java + is powerful
c) is powerful
d) Nothing; compile-time error

Answer: d

Title: Output of code snippet with string expression
Difficulty: Medium
Section Reference 1: 2.5 Strings

65) What does the following statement sequence print?

```
String str = "Java";
str += " is powerful";
System.out.println(str);
```

a) Java is powerful
b) Java + is powerful
c) is powerful
d) Compile-time error

Answer: a

Title: Output of code snippet with string expression
Difficulty: Medium
Section Reference 1: 2.5 Strings

66) What does the following statement sequence print if the user input is 123?

```
public static void main(String[] args)
{
   Scanner in = new Scanner(System.in);
   System.out.print("Enter a number ");
   int myInt = in.nextInt();
```



```
   myInt += 456;
   System.out.println(myInt);
}
```

a) 579
b) Compile-time error
c) Run-time error
d) 123456

Answer: a

Title: Output of code snippet with Scanner input
Difficulty: Medium
Section Reference 1: 2.3 Input and Output

67) What does the following statement sequence print if the user input is 123?

```
public static void main(String[] args)
{
   Scanner in = new Scanner(System.in);
   System.out.print("Enter a number: ");
   String str = in.next();
   str += 456;
   System.out.println(str);
}
```

a) 579
b) Compile-time error
c) Run-time error
d) 123456

Answer: d

Title: Output of code snippet with Scanner input
Difficulty: Medium
Section Reference 1: 2.3 Input and Output

68) What is the output of the following statement sequence?

```
public static void main(String[] args)
{
   int x = 100.0 % 6.0;
   System.out.println(x);
}
```

a) 4
b) Compile-time error

c) Run-time error
d) 16

Answer: b

Title: Output of code snippet with modulus operator
Difficulty: Medium
Section Reference 1: 2.2 Arithmetic

69) Which statement is true?

a) Variables cannot be assigned and declared in the same statement
b) Variable names must contain at least one dollar sign
c) Variable names can be no more than 8 characters long
d) It is incorrect to initialize a string variable with a number

Answer: d

Title: Which statement about variable names is true?
Difficulty: Easy
Section Reference 1: 2.1 Variables

70) Which statement about number literals in Java is false?

a) Numbers in exponential notation always have type `double`
b) Zero is an integer
c) Integers must be positive
d) An integer with fractional part of .0 has type `double`.

Answer: c

Title: Which statement about number literals in Java is false?
Difficulty: Easy
Section Reference 1: 2.1 Variables

71. Which option represents the best choice for a variable name to represent the average grade of students on an exam?

a) `averageGrade`
b) `$averageGrade`
c) `avg`
d) `AveGd`

Answer: a

Title: Which option is the best variable name?
Difficulty: Easy
Section Reference 1: 2.1 Variables

72) The assignment operator

a) denotes mathematical equality
b) places a new value into a variable
c) means the same as the equals sign used in algebra
d) makes it illegal to write a statement like `sum = sum + 4;`

Answer: b

Title: What is true about the assignment operator?
Difficulty: Easy
Section Reference 1: 2.1 Variables

73) Which of the following statements about constants in Java are true?

I. Although not required, constants are commonly named using uppercase letters
II. Only integer values can appear as constants
III. A variable can be defined with an initial value, but the reserved word `final` prevents it from being changed
IV. A named constant makes computations that use it clearer

a) I, II, III
b) II, III, IV
c) I, III, IV
d) I, II, IV

Answer: c

Title: Which of the following statements about constants are true?
Difficulty: Easy
Section Reference 1: 2.1 Variables

74) What is the output of this code snippet?

```
int sum = 22;
sum = sum + 2;
System.out.print(sum);  // sum = sum + 4;
System.out.print(sum);
```


a) 2424
b) 2425
c) 2428
d) 2528

Answer: a

Title: What is the output of the code snippet?
Difficulty: Easy
Section Reference 1: 2.1 Variables

75) What is the output of this code snippet?

```
double average;
int grade1 = 87;
int grade2 = 94;
// System.out.print("The average is " + (grade1 + grade2) / 2.0);
System.out.print("The average is " + average);
```

a) Unpredictable result
b) The average is 91.5
c) The average is 91.5
The average is 91.5
d) The average is 91.5
The average is 0.0

Answer: a

Title: What is the output of the code snippet?
Difficulty: Medium
Section Reference 1: 2.1 Variables
Section Reference 2: Common Error 2.1

76) What is the output of the following code snippet?

```
int counter = 0;
counter++;
System.out.print("The initial value of the counter is ");
System.out.println(count);
```

a) The initial value of the counter is 0
b) The initial value of the counter is 1
c) The code will not compile
d) The initial value of the counter is

Answer: c

Title: What is the output of the code snippet (using the ++ operator and initialization of variables)?
Difficulty: Easy
Section Reference 1: 2.1 Variables
Section Reference 2: Common Error 2.1

77. Which statements about numeric types in Java are true?

I. There is more than one integer type
II. The data type `float` uses twice the storage of `double`
III. The numeric range of the Java integer type is related to powers of two

a) I, II
b) I, III
c) II, III
d) I, II, III

Answer: b

Title: Which statements about numeric types in Java are true?
Difficulty: Easy
Section Reference 1: 2.1 Variables
Section Reference 2: Special Topic 2.1

78. The typical ranges for integers may seem strange but are derived from

a) Base 10 floating-point precision
b) Field requirements for typical usage and limits
c) Overflows
d) Powers of two because of base 2 representation within the computer

Title: What is the reason for the ranges for integer values in Java?
Difficulty: Medium
Section Reference 1: 2.1 Variables
Section Reference 2: Special Topic 2.1

79. What is result of evaluating the following expression?

```
(45 / 6) % 5
```

a) 2
b) 7

c) 2.5
d) 3

Answer: a

Title: What is the result of evaluating this arithmetic expression using the mod operator?
Difficulty: Easy
Section Reference 1: 2.2 Arithmetic

80. What is the difference between the result of the following two Java statements?

I. `int cents = (int)(100 * price + 0.5);`
II. `int cents = (100 * price + 0.5);`

a) Statement I causes truncation, but II does not
b) Statement II causes truncation, but I does not
c) Statement I compiles, but II does not
d) Statement II compiles, but I does not

Answer: c

Title: What is the difference in execution and result between these two Java statements?
Difficulty: Medium
Section Reference 1: 2.2 Arithmetic
Section Reference 2: Special Topic 2.3

81) The first step in problem solving is

a) To write the expression that calculates the answer
b) To understand the problem and its inputs and outputs
c) To do examples by hand that confirm the solution will work
d) To write Java code that can be executed and tested

Answer: b

Title: What is the first step in problem solving?
Difficulty: Easy
Section Reference 1: 2.4 Problem Solving: First Do it By Hand

82) At what point in the problem-solving process should one write pseudocode?

a) After writing Java code, as a way to summarize the code's algorithm
b) Before writing Java code, as a guide for a general solution
c) After defining Java variables so that the pseudocode and data types make sense

d) Before working out examples by hand in order to guide those examples

Answer: b

Title: When should pseudocode be written (in the steps for problem solving)?
Difficulty: Easy
Section Reference 1: 2.4 Problem Solving: First Do it By Hand

83) The problem solving process emphasizes a "first, do-it-by-hand" approach because

a) Pseudocode is not able to capture the subtleties of complex problems.
b) it is faster to do computations by hand than to do them by computer.
c) this guarantees that programs will be correct.
d) if programmers cannot compute a solution by hand, it is unlikely they will be able to write a program that can do it.

Answer: d

Title: Why should one "do examples by hand" in problem solving?
Difficulty: Easy
Section Reference 1: 2.4 Problem Solving: First Do it By Hand

84) What is the output of the following code snippet?

```
String firstname = "William";
String lastname;
System.out.println("First: " + first);
System.out.println("Last: " + lastname);
```

a)
First: William
Last:
b)
First: William
Last: lastname
c)
Code will not compile
d)
Unpredictable output

Answer: c

Title: What is the output of the code snippet (strings)
Difficulty: Medium
Section Reference 1: 2.5 Strings

85) What is the correct way to invoke methods on variables in Java that are strings?

a) Methods can only be invoked on string constants, not on variables.
b) For each method there is a special operator that must be used.
c) There are no methods available in Java for string variables.
d) Invoke them using the variable name and the dot (.) notation.

Answer: d

Title: How should methods be invoked on string variables?
Difficulty: Easy
Section Reference 1: 2.5 Strings

86) Suppose a phone number, stored as a ten-character string (of digits only) called `phoneNumber`, must be converted into a string that has parentheses around the area code. Which statement below will do that?

a) `String newNumber = "(" + phoneNumber.substring(3, 0) + ")";`
b) `String newNumber = "(" + ")" + phoneNumber;`
c) `String newNumber = "(" + phoneNumber.substring(1, 3) + ")" + phoneNumber.substring(3, 7);`
d) `String newNumber = "(" + phoneNumber.substring(0, 3) + ")" + phoneNumber.substring(3, 10);`

Answer: d

Title: How do you manipulate a phone number as a string?
Difficulty: Hard
Section Reference 1: 2.5 Strings

87) Which of the following options defines an integer variable?

a) `char age;`
b) `integer age;`
c) `int age;`
d) `age: int;`

Answer: c

Title: Which defines an integer variable?
Difficulty: Easy
Section Reference 1: 2.1 Variables

88) Which statement is true about variable names in Java?

a) They can contain the percent sign (%)
b) They can contain an underscore symbol ("_")
c) They can contain spaces
d) They must make sense as a word

Answer: b

Title:
Difficulty: Easy
Section Reference 1: 2.1 Variables

89) Consider the following Java variable names:

I. `1stInstance`
II. `basicInt%`
III. `empName_`
IV. `addressLine1`
V. `DISCOUNT`

Which of the following options is correct?

a) Only IV is a valid Java variable name.
b) Only I and IV are valid Java variable names.
c) Only I, IV, and V are valid Java variable names.
d) Only III, IV, and V are valid Java variable names.

Answer: d

Title: Which is correct (about variable names)?
Difficulty: Medium
Section Reference 1: 2.1 Variables

90) Which is the appropriate time to initialize a variable?

a) When you define it
b) When you use it
c) At the end of the program
d) Before the main function

Answer: a

Title: Which is the appropriate time to initialize a variable?
Difficulty: Medium
Section Reference 1: 2.1 Variables

91) What is the result of the following code snippet?

```
double bottles;
double bottleVolume = bottles * 2;
System.out.println(bottleVolume);
```

a) 0
b) 1
c) 2
d) Does not compile

Answer: d

Title: What is the result of snippet (with assignment)?
Difficulty: Medium
Section Reference 1: 2.1 Variables
Section Reference 2: Common Error 2.1

92) Which one of the following is a correct method for defining and initializing an integer variable with name `value`?

a) `int value = 30;`
b) `Int value = 30;`
c) `int value = .30;`
d) `Int value = .30;`

Answer: a

Title: Which correctly defines and initializes an integer variable `value`?
Difficulty: Easy
Section Reference 1: 2.1 Variables

93) What is wrong with the following code snippet?

```
int size = 42;
cost = 9.99;
System.out.println("size = " + size);
System.out.println(" cost = " + cost);
```

a) The code snippet uses a variable that has not yet been initialized.
b) The code snippet uses a variable that has not been declared.

c) The code snippet attempts to assign a decimal value to an integer variable.
d) The code snippet attempts to assign an integer value to a decimal variable.

Answer: b

Title: What is wrong with snippet?
Difficulty: Medium
Section Reference 1: 2.1 Variables
Section Reference 2: Common Error 2.1

94) Which one of the following reserved words is used in Java to represent a value without a fractional part?

a) `integer`
b) `int`
c) `Int`
d) `Float`

Answer: b

Title: Which reserved word represents a value without a fractional part?
Difficulty: Easy
Section Reference 1: 2.1 Variables

95) In an airline reservation system, the number of available seats in an airplane is required. Which data type should be used to store this value?

a) `double`
b) `float`
c) `int`
d) `long`

Answer: c

Title: Which data type should store the number of available seats in an airplane?
Difficulty: Medium
Section Reference 1: 2.1 Variables

96) In an airline reservation system, the cost of an airline ticket is required. Which data type should be used to store this value?

a) `int`
b) `byte`

c) `double`
d) `short`

Answer: c

Title: Which data type should store the cost of an airline ticket?
Difficulty: Easy
Section Reference 1: 2.1 Variables

97) What is wrong with the following code snippet?

```
int price;
price = 9.42;
```

a) The `price` variable is never initialized.
b) The data type for the `price` variable is not specified.
c) The `price` variable is never assigned a value.
d) The `price` variable is assigned a decimal value.

Answer: d

Title: What is wrong with snippet (with value assigned to variable)?
Difficulty: Medium
Section Reference 1: 2.1 Variables

98.) Which one of the following is an assignment statement?

a) `int a = 20;`
b) `a = 20;`
c) `assign a = 20;`
d) `assign 20 to a;`

Answer: b

Title: Which is an assignment statement?
Difficulty: Easy
Section Reference 1: 2.1 Variables

99) Which one of the following types of statements is an instruction to replace the existing value of a variable with another value?

a) Update
b) Declaration
c) Assignment

d) Initialization

Answer: c

Title: Which statement replaces the existing value of a variable with another value?
Difficulty: Easy
Section Reference 1: 2.1 Variables

100) What is the meaning of `x = 0;` in Java?

a) It checks whether x equals 0.
b) It sets the variable x to zero.
c) It defines a variable named x and initializes it with 0.
d) It is a syntax error because x is not always 0.

Answer: b

Title: What is the meaning of `x = 0;` in Java?
Difficulty: Easy
Section Reference 1: 2.1 Variables

101) What are the values of `num1` and `num2` after this snippet executes?

```
double num1 = 4.20;
double num2 = num1 * 10 + 5.0;
```

a) `num1 = 4.20 and num2 = 63.0`
b) `num1 = 4.20 and num2 = 47.0`
c) `num1 = 42.0 and num2 = 42.0`
d) `num1 = 42.0 and num2 = 47.0`

Answer: b

Title: What are `num1` and `num2` after snippet (with assignment)?
Difficulty: Medium
Section Reference 1: 2.2 Arithmetic

102) Which of the following statements places input into the variable `value` given this line of code?

```
Scanner in = new Scanner(System.in);
```

a) `int value = in();`
b) `int value = in.nextInt();`

c) `int value = in.next();`
d) `int value = in.nextFloat();`

Answer: b

Title: Which statement places input into the variable `value`?
Difficulty: Easy
Section Reference 1: 2.3 Input and Output

103) Assuming that the user inputs a value of 30 for the price and 10 for the discount rate in the following code snippet, what is the output?

```
Scanner in = new Scanner(System.in);
System.out.print("Enter the price: ");
double price = in.nextDouble();

System.out.print("Enter the discount rate: ");
double discount = in.nextDouble();

System.out.print("The new price is ");
System.out.println(price - price * (discount / 100.0));
```

a) The new price is 30
b) The new price is 20
c) The new price is 27.0
d) The new price is 33.0

Answer: c

Title: What is output of snippet (that calculates value based on user input)?
Difficulty: Medium
Section Reference 1: 2.3 Input and Output

104) Which of the following statements is correct about constants?

a) Constants are written using uppercase letters because the compiler ignores constants declared in lowercase letters.
b) The data stored inside a `final` variable can be changed using an assignment statement.
c) You can make a variable constant by using the `constant` reserved word while declaring the variable.
d) Variables defined using `final` make a code snippet more readable and easier to maintain.

Answer: d

Title: Which statement is correct about constants?
Difficulty: Medium

Section Reference 1: 2.2 Arithmetic

105) What is the value of `Math.pow(2, 3)?`

a) 5
b) 6
c) 8
d) 9

Answer: c

Title: What is the value of `Math.pow(2, 3)?`
Difficulty: Easy
Section Reference 1: 2.2 Arithmetic

106) Which one of the following is a correct representation of the given mathematical expression in Java?

$$\frac{(a - b/2)}{2}$$

a) `a - b / 2 % 2`
b) `a - b / 2`
c) `a - (b / 2) / 2`
d) `(a - b / 2) / 2`

Answer: d

Title: Which is the Java equivalent of this mathematical expression?
Difficulty: Easy
Section Reference 1: 2.2 Arithmetic

107) Given the definition `final double PI = 3.14159;` which of the following is the Java equivalent of the mathematical expression $c = \pi \cdot radius^2$

a) `c = PI * (radius * 2);`
b) `c = PI * Math.pow(2, radius);`
c) `c = PI * Math.pow(radius, 2);`
d) `c = Math.pow(PI * radius, 2);`

Answer: c

Title: Which is the Java equivalent of this mathematical expression?
Difficulty: Medium
Section Reference 1: 2.2 Arithmetic

108) Which of the following is the mathematical equivalent of the following Java expression?

```
h = (4.0 * a * b - Math.pow(b, 2)) / c;
```

a) h = 4ab – 2b / c
b) h = (4ab – 2b) / c
c) h = 4ab – b^2 / c
d) h = (4ab – b^2) / c

Answer: d

Title: Which is the mathematical equivalent of Java expression?
Difficulty: Medium
Section Reference 1: 2.2 Arithmetic

109) Which of the following statements displays

```
price =      20.00
```

a)
```
System.out.print("price = ");
System.out.printf(price);
```
b)
```
System.out.print("price = ");
System.out.printf("%f", price);
```
c)
```
System.out.print("price = ");
System.out.printf("%10.2f", price);
```
d)
```
System.out.print("price = ");
System.out.printf("%2.10f", price);
```

Answer: c

Title: Which statement displays (this formatted output)?
Difficulty: Easy
Section Reference 1: 2.3 Input and Output

110) What is the output of the following code snippet?

```
System.out.printf("%5.3f", 20.0);
```


a) 20
b) 20.0
c) 20.00
d) 20.000

Answer: d

Title: What is output of code using format specifier?
Difficulty: Easy
Section Reference 1: 2.3 Input and Output

