Please write your name and username here legibly: _____

C212/A592 ○ 6W2 Summer 2017 ○ Early Evaluation Exam: Fundamental Programming Structures in Java

Use `BigDecimal` (a class defined in package `java.math`) to write the following expressions in Java:

1. `4.35 * 100`
2. `0.1 + 0.1 + 0.1`
3. `2 + 3 * 4`
4. `(2 + 3) * 4`
5. `(1 + 2) * (3 + 4)`
6. `1 + 2 * 3 + 4`

Evaluate the following Java expressions:

7. `5 % 3`
8. `-5 % 3`
9. `"substring".substring("length".length())`
10. `true || ! true && false`
11. `true || ! (true && false)`
12. `"This\nis\nnot\nit!".length()`
13. `"\\\\\\\\".length()`
14. `"mesquite in your cellar".replace('e', 'o')`
15. `"\\\\n\"".length()`
16. Write a Java `String` literal that prints as five backslashes: `\\\\\`

Simplify the following expressions where `b` is a `boolean` variable and `n` is an integer:

17. `b == true`
18. `b == false`
19. `b && !b`
20. `b || !b`
21. `n > 3 && n > 5`
22. `n > 3 && n < 5`
23. `n < 3 && n > 5`
24. `n < 3 || n > 5`
25. `n > 3 || n > 5`
26. `b && true`
27. `b && false`
28. `b || true`
29. `b || false`

Evaluate the following Java expressions:

30. `1 / 2 * 4`

31. `4 * 1 / 2`

32. `(41 - 32) * 5 / 9`

33. `5 / 9 * (41 – 32)`

34. If `a` and `b` are boolean variables is `!(a && b)` equivalent with `(!a || !b)`? Why or why not?

35. If `m` and `n` are `int` variables and `n` is not zero can the following expression be simplified?

```
m / n * n + m % n
```

If not briefly explain why. If yes what is the value?

36. What values are in n and m at the end of the following code fragment:

```
int n = 3, m = 5; n = m + n; m = n - m; n = n - m;
```

What are the types of each of the following Java expressions:

37. `Math.sqrt(2)`

38. `System.out`

39. `3 '3' and "3"`

40. What is wrong with the following loop for finding the position of the first space in a `String str`?

```
boolean found = false;
for (int position = 0;
     !found && position < str.length();
     position++){
  char c = str.charAt(position);
  if (c == ' ') {
    found = true;
  }
}
```

41. What is wrong with the following loop for reading a sequence of values?

```
System.out.println("Enter values, Q to quit: ");
do {
  double value = in.nextDouble();        // in is a java.util.Scanner
  sum = sum + value;         // sum, count defined earlier as doubles
  count++;                 // both properly initialized upon creation
} while (in.hasNextDouble());
```

42. Suppose Java didn't have a do loop. Could you rewrite any do loop as a while loop? Explain w/ code.

Use this as scratch paper and turn it in. Don't forget to sign this too: _____