Unless mentioned otherwise, all coding questions reference the Java 8 language.

1. In html or jsp files, the <input ... > element can have several attributes.

   Which attribute should you use for JavaScript's getElementById(...) ___id = "name"___ ?

   Which attribute should you use for Java's request.getParameter(...) ___name = "name"___ ?

2. Name three types of Java comments and give syntax examples.

   a. ___Single-line___   // comment

   b. ___Block___   /* Block comment */

   c. ___Javadoc___   /** Method comment */

3. In Java, statements with what type of modifier(s) should have Javadoc comments coded? ___public / protected___

4. Which of the following is *not* true regarding legal java identifiers?

   a. A java identifier can start with an underscore (_)

   b. A java identifier can start with a currency character ($)

   c. A java identifier can start with a number

   d. A java identifier can start with an uppercase letter

5. An object can be a person, ___place___ , ___thing___ , or ___event___ .

6. In Java, can you have a final abstract class? Why or why not?

   ___No it cannot. Your class can only be final or abstract.___

7. Methods which are marked protected can be accessed by classes in different packages.

   a. True

   (b.) False

8. Methods that do not have any access modifier can be accessed by classes in other packages.

   (a.) True

   b. False

9. According to BCBSSC standards, what javadoc annotation(s) should be coded before a method that returns a value? ___@return___

10. According to BCBSSC standards, what annotation should be coded before a toString( ) method in a bean?

    ___@Override___

11. Making a member ___private___ means that it is only visible to methods in the same class.

12. Methods that are marked as "private" can be accessed by the subclasses of that class.

    a. True

    (b.) False

13. Making a member __Static__ means that there is only one instance of that particular member variable.

14. Making a member __final__ means that it can only be assigned once, making the compiler more optimized, since it knows the value of the variable will never change once assigned.

15. Giving the following line of code, where the parameter will never be changed within the method, add just one word that will make it more efficient:

    ```
    public String myMethod(BigDecimal cost) { . . . }   final (before parameter)
    ```

16. Given the following code:

    ```
    private static final Person myPerson = new Person("John","Smith",1234,"May 3");
    ```

    ...where Person is a bean with the four attributes (firstName, lastName, bankBalance, and birthDate), and getters and setters, is it possible to change bankBalance for the instance named myPerson? Explain your answer.

    a. Yes, _it is because only the reference is final, not the attributes._

    b. No, _____

17. Referencing the code in the previous question, create a JUnit test that will test the bankBalance in the Person class. Start your code with the appropriate JUnit annotation.

    ```
    @Test
    public final void testBankbalance(){
    Person myPerson = new Person("John", "Smith", 1234, "May 3");
    assertEquals("Testing bank balance", myPerson.getBankBalance(), 1234);
    }
    ```

18. Show the code for two constructors that illustrate "cascading" (aka "telescoping"). The first constructor receives two Strings and validates both. The second constructor only receives the first string, and validates it. Assume these two methods exist for validating these Strings: **validate1** and **validate2**. Your class name is MyBean.

    ```
    public MyBean (String validate1, String validate2) {
        validate here... ;
        this(validate1);
    }

    public MyBean (String validate1){
        validate here...;
    }
    ```

19. Code an enum that lists up to four URL pages that you have created so far. You should list the constant name as well as the associated value. Code the entire enum, including constructor, methods, and variables.

```
Public enum URIS {
    PAGE_ONE ("Page1.jsp"),
    PAGE_TWO ("Page2.jsp"),
    PAGE_THREE ("Page3.jsp"),
    PAGE_FOUR ("Page4.jsp");

    private string url = null;

    private url (string url) {
        this.url = url;
    }

    public String getUrl() {
        return url;
    }
}
```

20. Suppose you have an ArrayList named 'studentCount' that holds four Integer values. Write a line of code to create this ArrayList and a second line that changes the first element in the ArrayList to 10.

```
List<Integer> studentCount = new ArrayList<Integer>(4);
studentCount.set(0, 10);
```

21. It is a best practice to follow what two rules in regards to naming a constant?

   a. All Upper Case letters
   b. Seperate words with underscores

22. To create text strings that are mutable, you can use what two classes?

   StringBuilder or String Buffer

23. What does "mutable" mean?

   mutable means the value can be changed.

24. Class 'Baseball' extends class 'Ball'. The throwBall( ) method is coded in both, with the one in the Baseball overriding the one in the 'Ball' class. Which method gets invoked in the following code?

```
Ball sport = new Baseball();
sport.throwBall();
```

    a. throwBall( ) in Ball

    b. compiler error

    c. runtime error

    (d.) throwBall( ) in Baseball

25. In Java 7 and earlier, assume that class Sport implements the interface SportInterface, and that class BaseBall extends Sport.

    (a.) 'Sport" must contain concrete methods for all methods in SportInterface

    b. 'Baseball' must contain concrete methods for all methods in SportInterface

    c. Baseball must contain concrete methods for the methods that have not been coded in as concrete (not abstract) in Sport.

26. A final method can be overridden.

    a. True

    (b.) False

27. Code a ternary operator in Java to make the word "**ducks**" singular or plural, based on the value in the int countOfDucks. This should work for zero, one, two, minus one, etc.

    String duck = countOfDucks <= 1 ? "duck" : "ducks";

28. You can use the increment and decrement operators with the byte type.

    (a.) True

    b. False

29. Which of the following is true regarding constructors in Java?

    a. They are called to initialize an object when the object is instantiated

    b. They must have the same name as the name of the class they're in

    c. They have no return type, including 'void'

    (d.) All of the above

30. A constructor is used to create a/an ___instance__ of__ an__ object___.

31. In Java, will the following statement compare as true or false?

```
String stringA = new String("Hello World! ");
String stringB = new String("Hello World! ");
If (stringA == stringB)  . . .
```

    a. True
    b. False

32. In Java, will the following statement usually compare as true or false?

```
String stringA = "Hello World! ";
String stringB = "Hello World! ";
If (stringA == stringB)  . . .
```

    a. True
    b. False

33. What are the values of x and y after executing the following statements?

```
int myIntA;
int myIntB;
myIntA = 3;
myIntB = myIntA++;
```

    a. myIntA = 3, myIntB = 3
    b. myIntA = 4, myIntB = 4
    c. myIntA = 4, myIntB = 3
    d. myIntA = 3, myIntB = 4

34. Which of the following statements is true about exceptions?

    a. All exceptions must be caught or handled in your Java program
    b. Only unchecked exceptions must be caught or handled in your Java program
    c. Only checked exceptions must be caught or handled in your Java program
    d. All of the above
    e. None of the above

35. Which of the following is illegal when defining a class in Java?

    a. class ClassA implements ClassB, ClassC...
    b. class ClassA extends ClassB...
    c. class ClassA extends ClassB, ClassC...
    d. class ClassA extends ClassB, implements ClassC

36. When is it permitted to code the following?

    ```
    ClassA obj = new ClassB();
    ```

    a. When ClassA is a subclass of ClassB

    b. When ClassB is a subclass of ClassA

    c. When ClassA and ClassB are both subclasses of the same superclass

    d. The statement is never legal

37. If a class is declared final, then:

    a. You cannot instantiate it

    b. You cannot extend it

    c. You cannot implement it

    d. "final" is invalid for a class

38. instanceof is a(n):

    a. Operator

    b. Method of an object

    c. Variable

39. Is it legal to access a static method using an instance of the class?

    a. Yes. It is the best way to access such a method.

    b. Yes, but it is strongly discouraged.

    c. No

40. What is the primary difference between a hash map and a tree map?
    A treemap is sorted by its keys (implemented by Red-Black tree).

41. In an ArrayList, if you don't specify the initial capacity, what will the default capacity be set to? _____
    1. O initially. It will become 10 when you add 1 thing to it.

42. Can a subclass access the private member variables of its own superclass?

    a. Yes

    b. No

43. How do you code a comment in HTML?

    a. `<- comment >`

    b. `<-- comment -->`

    c. `<!-- comment -->`

    d. `<comment />`

44. What is the recommended way to code a comment in a JSP? _____

45. The HTML <form> element is a block level element, so browsers create a line break before and after the form.

    (a.) True
    b. False

46. List three different uses of the <meta> tag in an HTML page.

    a. Define keywords for search engines
    b. Define page Author
    c. Refresh page at intervals

47. Given the HTML code below, fill in the missing CSS so that the text 'My Link' is assigned the color red.

    Assume there are other unordered lists in the webpage, and you want just this link in this list to be red.

    css:

    ```
    #list2 li a          {

                         color: red;

                         }
    ```

    html:

    ```
    <ul id="list2">
            <li><a href=" . . . ">My Link</a></li>
    </ul>
    ```

48. If you want to preserve the spacing in your HTML code, what tag could you use? <pre>

49. If you want three spaces between two values in your JSP, what entity can you code?   3 times

50. Referencing the following CSS code, fill in the blanks with either 5px, 25px, or 40px.

    ```
    border-width: 25px 5px 40px;
    ```

    a. Left-border   5px
    b. Bottom-border   40px
    c. Top-border   25px
    d. Right-border   5px

51. One __em__ is equal to the current font size (specify the CSS measurement value).

52. In JavaScript, what is the value of 'myVariable' in the following code? True

    ```
    var myVariable = !isNaN("12.345");
    ```

53. Given a Date object named dueDate, which statement(s) set(s) the month to February?

    (a.) dueDate.setMonth(1);
    b. dueDate.setMonth(2);
    c. dueDate.setMonth("Feb");
    d. dueDate.setMonth("February");
    e. dueDate.setMonth(Calendar.FEBRUARY);

54. What are the three primitive data types in JavaScript (code the correct upper/lower case)?

    a. _boolean_

    b. _number_

    c. _string_   object

55. Show an example to create an insurancePolicy using JavaScript in a JSP file.

```
var insurancePolicy = {
    insurance Type : "Type",
    ID : "ID",
    Policy: "Policy"
};
```

56. Show the code to place the cursor in an input text field with id=price.

```
<input type="text" id="price" autofocus />
```

57. According to the BCBSSC standards, which is the valid way to access a form in your JavaScript?

    a. document.forms[0]

    (b.) document.formname

58. Given the HTML code below, write the JavaScript function so that if the checkbox isn't checked, an alert will prompt the user to make a selection. If the checkbox is checked, an alert will let the user know that their order will be processed. Follow BCBSSC standards.

```
<form name="orderForm">
        <input type="checkbox" name="processOrder">Process my order
        <input type="button" value="Click to continue" onClick="goProcess();">
</form>
```

```
<script>
function goProcess() {
    if (document.getElementsByName[0].checked == false) {
            alert("check the box!");
    }
}
</script>
```

59. When should you use JavaScript validation, and when should you use server validation?

    JavaScript validation should be checking for incomplete fields.
    Server validation is for correct information.

60. Assume you are in the doPost method of a servlet. Write the code to forward a URL request to a JSP page, named mainmenu.jsp that is in a folder named jsp, where both are in the context named web5.

request.getRequestDispatcher("jsp/mainmenu.jsp").forward(request, response);

61. One of the advantages of the post method over the get method is that it is easier to bookmark.

    a. True

    b. False

62. What is wrong with the following JSP footer code?

```
<% page import="java.util.*" %>
<%
        Calendar currentDate = new GregorianCalendar( );
        int  currentYear = currentDate.get(Calendar.YEAR);
%>
```

Should never import a whole library.

63. Which of the following JSP expressions is valid?

    a. <%= request.getParameter("occupation"); %>

    b. <%= request.getParameter("occupation") %>

    c. <%= String occupation = request.getParameter("occupation"); %>

    d. <%= String occupation = request.getParameter("occupation") %>

    e. none of the above

64. Which of the following JSP expression(s) is equivalent to

              <jsp: getProperty name="book" property="title" />

    a. <%= book.getTitle( ) %>

    b. <%= bean.getBook("title") %>

    c. <%= bean.getTitle("book") %>

    d. <%= book.getBook( ) %>

65. Write the EL code for accessing the 'time' property in a session attribute named 'clock'.

    ${ sessionScope.clock.time }

66. Write the EL code for accessing the 'time' property in an attribute named 'clock' of the request object (explicitly specify the scope).

    ${ requestScope.clock.time }

67. To get the effect of a Java nested if/else-if/else-if or switch, code this JSTL tag in your JSP:

<c:when> ... </c:when> <c:otherwise>... </c:otherwise>

68. If the following code is used to parse an attribute named 'emailAddress' that contains a value of 'jjones@net@asset.com', what is displayed in the browser?

```
<p>
<c:forTokens var="part" items="${emailAddress}" delims="@">
    ${part}<br>
</c:forTokens>
</p>
```

a. jjones

   net

   asset

   com

b. jjones

   net

   asset.com

c. jjones

   net@asset

   com

d. jjones

   net@asset.com

69. Another name for web.xml is _Deployment   Descriptor_.

70. Identify five items in the code below that break Java coding convention standards at BCBSSC.

```
package com.bcbssc.eltp.dbconn;

public class TestStuff {

        public static void main (String args[])
        {
                int count1, count2;
                count1 = 10;
                count2 = 5;
                if(count1 != count2)
                        System.out.println("Count's don't equal!");
        }
}
```

a. _No brackets on if statement_

b. _Main() brackets are on wrong line. should be main() {_

c. _Should not declare multiple variables on one line._

d. _Should declare and initialize on one line._

e. _____

71. Given these values for a Java array {3,8,12,5,9,21,6,10}, write a loop that will display just the odd numbers.

```
for (int i=0; i < array.length; i++) {
    if (i % 2 == 1) {
        System.out.println(i);
    }
}
```

72. What is the Singleton design pattern?

It restricts the instantiation of a class to a single instance.

73. Give an advantage to using BigDecimal over float or double

It provides more accuracy than floats or doubles.

74. Give a disadvantage to using BigDecimal over float or double (other than that it is more difficult to code).

It is slower and harder to program algorithms since +, -, /, × are not overloaded.

75. On which lines does autoboxing/unboxing occur in the following code?

```
Integer count = 5;
count++;
if  (count.equals(6)) {
        System.out.println(count + " is equal to 6");
        }
```

76. What is an advantage to using a factory?

I + provides abstraction between implementation and client classes through inheritance.

77. What is another advantage to using a factory?

It removes the instantiation of classes from client code.

78. In Java, name 4 ways to loop thru lines of code in Java?

for, while, for each, do while

79. In Java, name 3 ways to code conditional processing, other than the conditions on loops?

if, else if, switch

NOTE: *The following may have multiple answers*

80. In Java, is **Employee** a variable, constructor, class, interface, or method? *class, interface*

81. In Java, is **employee** a variable, constructor, class, interface, or method? *variable*

82. In Java, is **employee()** a variable, constructor, class, interface, or method? *method*

83. In Java, is **Employee()** a variable, constructor, class, interface, or method? *Constructor*

84. In Java, Contrast a primitive and an object. Give at least three differences.
    a. Primitives are passed by value, objects by reference
    b. Primitives are immutable, objects are not by default.
    c. objects have shallow and deep copies that are significantly different, where primitives have deep copy only.

85. In Java, what is a null?
It is a reference type whose value does not refer to an object.

86. What type of variables can have null values in Java
Objects.

87. What is the difference between a static variable and a static final variable?
static - only 1 instance but can be changed.
static final - only 1 instance but cannot be changed.

88. What is a static method?
A method that belongs to a class but cannot be directly accessed by instance variables or methods.

89. What is the difference between a static method and a static final method ?
A static final method cannot be hidden in a subclass, or overriden.

90. What restriction does "final" place on a method?
It prevents subclasses from overriding or hiding it.

91. What is a method signature?
The method name along with its parameters and their order.

92. What is method overloading?
Having two methods with the same name but different parameters or parameter orders.

93. What is method overriding?

when a subclass changes the functionality of a method but retains the signature.

94. A primitive array holds _actual values_ while an array of objects holds _references_ .

95. What is an advantage to using an interface?

It allows multiple inheritance and different classes can make use of methods in their own way.

96. What is another advantage to using an interface?

They also provide you the ability to inject dependencies.

97. What is a third advantage to using an interface?

They allow for separation of concerns.

98. Name three places where css can be coded for an html or JSP file

1. .css file.

2. In <style> tags in file (html/jsp) <head>.

3. In line/embedded into html code.

99. Name three places where JavaScript can be coded for an html or JSP file.

1. .js file.

2. In <script> tags in <head>.

3. In <script> tags in <body>.

100. What is the DOM?

It is the Document Object Model that treats the html document as a tree structure.

101. Name three events that you can use to trigger a JavaScript function?

onClick, onChange, onload

102. Describe is the MVC design pattern?

It specifies that an application consists of a data model (M), that contains pure data; a view (V) that presents model data to the user; and a controller (C) that exists between the previous two, and contains logic.

103. JSPs look like HTML. What are two huge differences between a JSP and HTML?

HTML is client side, where the JSP runs on the server side. JSPs can use JSP tags and HTML tags, but HTML page can only use HTML Tags.

104. (6 points) What is the non-host equivalent of each of the following host terms:

    a. Dataset

    b. JCL

    c. Compiler

    d. Endeavor — GitHub

    e. Abend — Exception

    f. PERFORM — while

105. What is your favorite thing that you have learned and/or accomplished so far in the ELTP-Java class?

I have enjoyed learning in-depth about all of the technologies. Especially the working with a dynamic web application.