

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 = '...'`?

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

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

- a. Single-line Comment Ex: `//display a welcome message`
`System.out.println("Welcome here");`
- b. End-of-line Comment Ex: `System.out.println(); // print a blank line`
- c. Block Comment Ex: `/**
 * Author: Skylar James
 */`

3. In Java, statements with what type of modifier(s) should have Javadoc comments coded? public, protected, private

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, because for final classes we can't create child class where as for abstract classes we should create child to provide implementation

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? @param + @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:

^{void}
`public String myMethod(BigDecimal cost) { . . . }`

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, because only the object's reference cannot be change

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 void testBankBalance() {
    Person person = new Person();
    person.setBankBalance(500.00);
    assertEquals("Get the balance", person.getBankBalance(), 0.001);
}
```

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) {
    this.setValidate1(validate1);
    this.setValidate2(validate2);
}

public MyBean(String validate1) {
    this(validate1);
}
```

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 MyUrls {  
    PRIVACY("privacypolicy.jsp"),  
    TERMS("termsofuse.jsp"),  
    LEGAL("legaldisclaimer.jsp"),  
    INVALID("invalid.jsp");  
    private String url;  
    private MyUrls(String u) {  
        this.url = u;  
    }  
    public String getUrl() {  
        return this.url;  
    }  
    public String toString() {  
        return "The current link" + u;  
    }  
}
```

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.

```
ArrayList<Integer> studentCount = new ArrayList<Integer>();  
studentCount.set(2, 10);
```

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

- Use all uppercase letters for naming a constant
- Separate the words in the name with an underscore.

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

StringBuffer or StringBuilder

23. What does "mutable" mean?

Mutable means that the value stored in the String Object 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.
- countOfDucks = "There" + (x > 0 ? " are. " + x + " ducks " : " is one cookie ") + " in the pond."
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 Object and initialize the objects state.

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?

HashMap is not sorted and a TreeMap is sorted.

41. In an ArrayList, if you don't specify the initial capacity, what will the default capacity be set to? 10

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? <%-- comment --%>

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 a description of your web page
- c. Provides metadata about the HTML document

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?

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 25px
- 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)?

- String
- Integer
- Boolean

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

```
var insurance = [];
function InsurancePolicy(insuranceType) {
    this.insuranceType = insuranceType;
}
function createInstance() {
    var insurance = new InsurancePolicy(document.
    getElementById("type").value);
}
```

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

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

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

- document.forms[0]
- 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.getElementById('orderForm').checked) {
            alert("Your order will be processed");
        } else {
            alert("You need to make a selection!");
        }
    }
</script>
```

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

You should use JavaScript validation to provide a better user experience, where as you use server validation to make sure you are getting input from the client (browser) is actually valid and not just supposed to be validated by the client.

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.

```
RequestDispatcher rd;  
rd = request.getRequestDispatcher("/jsp/mainmenu.jsp");  
rd.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);
```

```
%>
```

In the first line is `<jsp:include page="/html/myFooter.html" flush="true"/>`

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'.

`$ {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> .

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:forEach var="part" items="${emailAddress}" delims="@">
    ${part}<br>
  </c:forEach>
</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!");  
    }  
}
```

- int count1, count2 should be on separate lines.
- The if statement is missing "{}".
- The "{}" on the main method should be next to the "}".
- The declared variables should be indented apart like int count1, count2;
- There needs to be a blank line between the variables

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.

```
int[] myArray = {3,8,12,5,9,21,6,10};  
for(int i=0; i<myArray.length; i++){  
    if(myArray[i]%2!=0){  
        System.out.println(myArray[i]);  
    }  
}
```

72. What is the Singleton design pattern?

The Singleton design pattern restricts the instantiation of a class and ensures that only one instance of the class exists in the Java Virtual Machine. The pattern has a private constructor, private static variable, and public static method.

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

One advantage of BigDecimal over float or double is that BigDecimal is more accurate than a float or a double.

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

A disadvantage of using BigDecimal over float or double is that BigDecimal is slower than a float or double.

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");  
}
```

lines 1 + 2

76. What is an advantage to using a factory?

Factories provides approach to code per to the interface rather than implementation.

77. What is another advantage to using a factory?

Factories makes our code more robust, less coupled and easy to extend.

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

Iterative for, "for" each, while, and do/while

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

If, Switch case, and ternary if

NOTE: The following may have multiple answers

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

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.

- Primitive cannot be null but objects can.
- Object is a reference and a primitive is a actual value.
- Primitives are independent data types whereas an object is dependent of Class "Object".

85. In Java, what is a null?

In Java null is the absence of a reference.

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

Strings

Instance Variables

87. What is the difference between a static variable and a static final variable?

A static variable is a variable that only has one copy or it whereas a static final variable is a variable that has one copy which can't be reinitialized.

88. What is a static method?

Is a method that belongs to a class, the method only exists once but can be used as many times as desired.

89. What is the difference between a static method and a static final method ?

A static method belongs to a class, the method exists only once. Whereas a static final method is a method that exists only once and the method cannot be overridden.

90. What restriction does "final" place on a method?

The method cannot be overridden.

91. What is a method signature?

Method signature is comprised of the method name, the method's parameters, and the order of types, return type is not part of the signature and neither are throws.

92. What is method overloading?

Method overloading is the same method name, but different parameter list, does not match, and throws and return type can be different.

93. What is method overriding?

Method overriding method signature matches, and the return type and throws are compatible

94. A primitive array holds default values while an array of objects holds object references

95. What is an advantage to using an interface?

Provides a "type" for variables and arrays.

96. What is another advantage to using an interface?

Provides shared constants.

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

Supports polymorphism without a superclass.

98. Name three places where CSS can be coded for an HTML or JSP file

External Stylesheet

Inline style to HTML tag

Embedded CSS between `<style>` `</style>` tags in the header in a HTML or JSP file

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

External Javascript

Embedded Javascript between `<script>` `</script>` in the `<head>` + `<body>`.

100. What is the DOM?

Document Object Model is a cross-platform and language independent convention for representing and interacting with HTML, XHTML and XML objects.

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

onFocus(), onClick(), + onLoad()

102. Describe the MVC design pattern?

MVC Pattern stands for Model-View-Controller.

Model - represents an object or JAVA POJO carrying data and also have logic.

View - Represents the visualization of the data. The model contains controller logic on both model and view. It controls the data flow into

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

JSP creates dynamic pages, while HTML creates static pages. JSP is a server-side scripting language, whereas HTML is a client-side scripting language. The model contains controller logic on both model and view. It controls the data flow into the model object and updates the view whenever it changes.

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

- a. Dataset - TreeMap
- b. JCL - App/Driver Java Class
- c. Compiler - javac.exe
- d. Endeavor - GitHub
- e. Abend - Exception
- f. PERFORM - While, for, do, or method call

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

My favorite thing that I learned so far in the ELTP-Java class is how to correctly use case switch statements and how that it is a valid java practice and not taboo like I was told in school.

