Non-Host 30 (2019) Mid-Term

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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(…) The ID attribute ?
   Which attribute should you use for Java's request.getParameter(…) The Name attribute ?

2. Name three types of Java comments and give syntax examples.
   a. // Single-line comments
   b. /* multi-line comments */
   c. /** Document comments */

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

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 you cannot create a child and for an abstract class you must make a child to implement the class

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? comment delimiters /** … */, with comments per class, interface, or member

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 final String myMethod(BigDecimal cost){...}

```
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, _____

b. No, because the method is private static final so you can't access the setters unless you are in the same class.

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 testPerson(){
    assertTrue("Person", myPerson.Person("John","Smith",1234,"May 3"));
}
```

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.

```
MyBean(String validate1, String validate2){
    this(validate1);
    if(validate2==null||validate2.equals("")) return false;
    return true;}

MyBean(String validate1){ this();
    if(validate1==null || validate2.equals("") return false;
    return true;}
```

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 Urls {

    LINK1("link1.jsp"),
    LINK2("link2.jsp"),
    LINK3("link3.jsp"),
    LINK4("link4.jsp");

    private String url;
    private Urls(String s) { this.url = s; }

    public String getUrl() { return this.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.

```
ArrayList<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 uppercase variable name
    b. Use underscores(_) for spaces

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

23. What does "mutable" mean?
    It means you can change an objects states and fields after it has been created

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.

Math.abs(countOfDucks) > 1 ? "ducks" : "duck";

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.

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 tree map is sorted and a hash map is not

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? <% -- 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. <meta charset="UTF-8">
    b. <meta name="author" content="Com 5">
    c. <meta name="viewport" content="width=device-width, initial-scale=1.0">

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 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? <c:out /> or
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? false

```
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. Number
    b. String
    c. Boolean

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

```
<script> function insurancePolicy() {
        // myInsurancePolicy
    }
</script> </head>
<body> <form name="myform" method="get" onSubmit="insurancePolicy()">
        <input type="submit" value="Submit">
</body>
```

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>
```

```
function goProcess() {
    processOrder.checked ? alert("please make selection") : alert("order is processed");
}
```

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

You should use JavaScript validation when you want to give feedback immediately to the user. (like an empty input field or incorrect syntax). Server validation should be used to authenticate the input / data.

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.

web5.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);
%>
```

You never display what the currentYear is, only saved it to a variable.

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:if></c:if> .

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 the 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. (String[] args)

b. int count1 and int count2 should be on seperate lines

c. brackets { } missing on if statement around System.out

d. Set the value of count1 and count2 when you declare them

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 (array[i] % 2 != 0){
        System.out.println(array[i] + " ");
    }
}
```

72. What is the Singleton design pattern?

A class must ensure that only single instances should be created and a single object can be used by all other classes

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

BigDecimal is more percise

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

BigDecimal is slower

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

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

Line 2

76. What is an advantage to using a factory?

It makes the code more robust

77. What is another advantage to using a factory?

It removes the need to implement the class
Allows you to use interface instead.

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

if / while / do-while / for

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

Switch, Break, and Continue

***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. primitive uses small amount of memory and object uses large amount of memory
    b. An object can contain primitive data,
    c. only 8 primitive types and 1000+ objects

85. In Java, what is a null?

    Null is an unset reference

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

    reference variables

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

    static final can only have one copy of the variable

    static variables can be changed by instances of a class

88. What is a static method?

    A method that is invoked through a class instead of a specific object of that class. Also they can only access static variables.

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

    static methods can be overwritten

    static final methods cannot be over written

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

    you can only create one instance of that method

91. What is a method signature?

    The method name and the parameter list

92. What is method overloading?

    Allows a class to have more than one method having the same name, if the argument lists are different.

93. What is method overriding?

Allows a subclass or child class to provide a specific implementation of a method that is already provided by one of its superclasses or parent classes

94. A primitive array holds arrays while an array of objects holds instances.

95. What is an advantage to using an interface?

Allows several classes to share a standard set of methods and constants without requiring these methods and constants to be implemented by a common superclass

96. What is another advantage to using an interface?

Interfaces function to break up the complex designs and clear the dependencies between objects

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

Full abstraction

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

inline, in between <script> tags in the <head> at top of file, or in a seperate css file

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

in the <head> tag, in the <body>, or in a seperat JavaScript file

100. What is the DOM?

The Document Object Model (DOM) is a programming interface for HTML & XML documents. It represents the page so the program can change the document structure, style, and content

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

1. HTML page has finished loading
2. HTML input field was changed
3. HTML button was clicked

102. Describe is the MVC design pattern?

The Model View Controller (MVC) design pattern specifies that an application consists of a data model, presentation information, and control information. Separation of Concerns

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

1. JSP creates dynamic pages, HTML creates static pages
2. JSP is serverside scripting language, HTML is client-side scripting language

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

a. Dataset – Array
b. JCL – J
c. Compiler – Build
d. Endeavor –
e. Abend –
f. PERFORM –

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

Being able to combine my web development experience w/ the new skills I am learning (Java) to create full functioning web apps.