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(...) ___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

   b. ___Multi-line___ /* comments with many lines */

   c. ___Documentation___ /** Java doc comments are like this */

3. In Java, statements with what type of modifier(s) should have Javadoc comments coded? _public method, class interface and enum_

4. Which of the following is *not* true regarding legal java identifiers? ISSM & best practices

   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, ___thing___ , ___place___ , or ___event___ .

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

   No. An abstract class cannot be instantiated by itself so you need to create child classes, and you can't create child classes for a final 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   same package

   (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   private member however can be accessed with public accessor

    (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 written above BigDecimal)

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 you can't set a new object to a private static final field.*

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 testPersonBankBalance() throws InsufficientFunds Exception {
        Person p = new Person("Mary", "Joe", 2000, "May 3");
        assertEquals ("Balance is equal" , 2000, p.getBankBalance());
    }
    ```

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 class MyBean {
        public String check(validate1, validate2){
            if (validate1. matches (" 1/+ABc")){
                return validate1;
            } else if (validate2.matches("1/AABc")) {
                return validate2;
            }
        }
        public String check(validate 1) {
            return this.check(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  UrlsEnum {
          MAIN ("main menu. jsp"),
          FINDCUSTOMER ("find customers.jsp",
          FIND SALESPERSON ("find saleperson. jsp"),
          PRIVACY (privacy jsp");

          private String url;
          private UrlsEnum (String url) {
               this, url = url;
          }
          public String get Url() {
               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.

List <Integer> studentCount = new ArrayList<> (4);

studentCount. add (0, 10);

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

a. Upper case

b. Underscore between words

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

StringBuffer or String Builder

23. What does "mutable" mean?

the value stored in the 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.

   int countOfDucks = 1 ? "duck" : countOfDucks > 1 ? "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 ___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! ");      .equals()
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

multiple interfaces
single extends superclass

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

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   _with getter_

    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. _Specifying keywords_
    b. _document description_
    c. _document revision date_

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 {

            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? _`<br>`_

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 _0px_
    b. Bottom-border _40px_
    c. Top-border _25 px_
    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. _string_
    b. _number_
    c. _boolean_

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

```
<%= function insurancePolicy (instId, insType, premium) {
        this. instId = instId;
        this. insType = insType;
        this. premium = premium;
    }
    policy1 = new insurancePolicy ("53M209", "Life", 50); %>
```

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

```
<input type="text" id="price" autofocus="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.getElementByName("processOrder").unchecked) {
        alert ("Please make a selection.");
    }
}
</script>
```

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

Use server validation when validating user input to protect against hackers. Use JavaScript validation when you want to provide better user experience and validate on the browser itself, like if validating email formatting.

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. get RequestDispatcher(" / web5 / jsp /mainmenu.jsp"). forward (request, reponse

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 have <%@ page language="java" contentType="   utf-8" pageEncoding="utf-8"
import = "java.util." %>*

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'.

    `<c:out value ="${ sessionScope. clock .time}" > </c:out>`

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

    `<c:out value="${ requestScope. clock. time}" > </c:out>`

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> some <\c:if>
         stuff

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 _____.

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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 copyright comments_
b. _no import statements_
c. _no javadoc comments_
d. _count1 and count2 declared on same line; should have one declaration per line_
e. _local variables not initialized when they are declared_

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

72. What is the Singleton design pattern?

Restricts the instantiation of a class to one single instance
Useful when exactly one object is needed.

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

There is loss of precision when using float or double. With BigDecimal, you can specify the number of decimal places you want to round to.

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

Takes more memory

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?

Removes instantiating the actual implementation classes, so the code is robust and easy to extend.

77. What is another advantage to using a factory?

Provides abstraction between implementation and other classes through inheritance

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

1) while
2) for
3) do while
4) for each

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

1) if - else
2) switch
3) 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.

    a. primitives can't be null

    b. primitives hold values, objects hold references

    c.

85. In Java, what is a null?

Null is a literal which indicates the variable does not refer to any object.

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

String
Object instances
Wrapper class instances

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

static variable does not have to be initialized at the time it declaration and can be reinitialized. Static final variable has to be initialized and cannot be reinitialized.

88. What is a static method?

methods that can only access the static members of the class and can only be called by other static methods.

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

Static final methods cannot be inherited

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

The method cannot be overridden and cannot assign a new value to a parameter.

91. What is a method signature?

the method name and its parameter types in order

92. What is method overloading?

When you create a method with the same name as another method but with a different parameter list

93. What is method overriding?

When a child class provides a specific implementation of a method that's already provided by the parent class. Ex. (speak() in child class Dog)

94. A primitive array holds __values__ while an array of objects holds __references__ .

95. What is an advantage to using an interface?

you can have multiple implementations

96. What is another advantage to using an interface?

interfaces provide a type for any new object that implements this interface

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

interfaces allows concrete classes to be used in multiple places without having to rewrite your classes for small changes in code.

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

1) in an external file
2) in line in a style = " "
3) in between <style> tags.

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

1) Between script tags
2) in an external .js file
3)

100. What is the DOM?

Document object model

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

1) on click
2) on load
3) on keychange

102. Describe ^{what} is the MVC design pattern?

MVC stands for Model View Controller which means classes that function as the model, view and controller are separated. The model is the business logic, the view is the output, and the controller is the driver that calls all the calculations of the model class.

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

JSP is dynamic and adds server code to an HTML page. HTML is static and has client side scripting.

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

a. Dataset   - file
b. JCL   - Java
c. Compiler   - JCLLIB or STEPLIB
d. Endeavor   - GitHub
e. Abend   - exception
f. PERFORM   - run the loop

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

My favorite thing to learn about was inheritance and polymorphism. I loved doing the Bank project I also really enjoyed the RPS web project. Making favicons was fun too!

you're an excellent teacher Mary, I learned more these few weeks than in 4 years of college!