Test: JP Java Programming Midterm Exam

Section 1

1. What is the output from the following code?

```
String s= "a,b,c";
Scanner sc = new Scanner (s);
while  (sc.hasNext())
 System.out.print (sc.next()  +" ");
```

   A. `a b c`
   B. `a c`
   C. `a,b`
   D. `a,b,c`

2. What is the output from the following code snippet?

```
int i=0,j=0;
i=++i;
j=i++;
System.out.println("i=" + i + " " + "j=" + j);
```

   A. The code will compile and print "`i=1 j=1`"
   B. The code will compile and print "`i=1 j=2`"
   C. The code will compile and print "`i=2 j=1`"
   D. The code will compile and print "`i=2 j=2`"
   E. The code does not compile

3. **True or False:** The following code can be compiled.

```
byte b = 1;
b = b + 1;
```

   A. True
   B. False

4. Which of the following declarations are wrong? (Choose Three)
    A. `abstract final class Hello{}`
    B. `abstract private void act(){}`
    C. `protected private int id;`
    D. `public abstract class Student{}`

5. Which two statements prevent a method from being overridden? (Choose Two)
    A. `final abstract void act() {}`
    B. `final void act() {}`
    C. `static final void act() {}`
    D. `static void act() {}`
    E. `void final act() {}`

6. What is the output from the following code snippet?

```
String str1= "java";
String str2=new String("java");
System.out.println( str1==str2 );
System.out.println( str1==str2.intern() );
```

    A. The code will compile and print "`false false`"
    B. The code will compile and print "`false true`"
    C. The code will compile and print "`true false`"
    D. The code will compile and print "`true true`"
    E. The code does not compile

7. Which combination of the following overload the `Student` constructor? (Choose Two)
    A. `protected int Student(){}`
    B. `public Object Student(int x,int y){}`
    C. `public Student(){}`
    D. `public Student(int x,int y){}`
    E. `public void Student(int x, int y){}`

Section 2

8. **True or False:** You can only implement one interface in a class.
    A. True
    B. False

9. **True or False:** Immutable classes can be subclassed.
    A. True
    B. False

10. Interfaces define what?
    A. All method definitions without any implementations
    B. All methods with implementations
    C. Constants and all methods with implementations
    D. Some methods with implementations
    E. Variables and methods

11. When line 10 is executed, which method will be called?

```
1.   class Account {
2.   public void deposit(int amt, int amt1) { }
3.   public void deposit(int amt){ }
4.   }
5.   public class CreditAccount extends Account {
6.   public void deposit() { }
7.   public void deposit(int amt) {}
8.   public static void main(String args[]){
9.   Account account = new CreditAccount();
10. account.deposit(10);
11. }
12. }
```

    A. Line 2
    B. Line 3
    C. Line 6
    D. Line 7

12. **True or False:** The `instanceof` operator allows you to determine the type of an object.
    A. True
    B. False

13. **True or False:** The `instanceof` operator can find subclass objects when they are passed to methods which declare a superclass type parameter.
    A. True
    B. False

14. **True or False:** Calling a subclass method by referring to a superclass works because you have access to all specialized methods through virtual method invocation.
    A. True
    B. False

15. What is special about including a resource in a try statement? (Choose Two)
    A. An error will be thrown if the resources does not open
    B. The program will fail if the resource does not open
    C. The resources will auto-close

16. **True or False:** Multiple catch statements can be used for a single try statement.
    A. True
    B. False

17. **True or False:** Methods cannot throw exceptions.
    A. True
    B. False

18. Which of the following are important to your survival as a programmer?
    A. Being good at reading code
    B. Being good at testing
    C. Looking for opportunities to read code
    D. All of the above
    E. None of the above

19. Which of the following statements is false?
    A. An `ArrayList` can grow and shrink dynamically as required
    B. An `ArrayList` can store multiple object types
    C. An `ArrayList` has a fixed length
    D. In an Array you need to know the length and the current number of elements stored

20. Which of the following is not a good technique to follow when reading code written by others?
    A. Build and run the code
    B. Find the author of the code and ask him how it works
    C. Learn the high level structure and starting point, and then figure out how it branches
    D. Perform testing
    E. Understand the constructs

Section 3

21. Which of the following is a sorting algorithm that involves repeatedly incrementing through the array and swapping 2 adjacent values if they are in the wrong order until all elements are in the correct order?
    A. Binary Search
    B. Bubble Sort
    C. Merge Sort
    D. Selection Sort
    E. Sequential Search

22. Which of the following is a sorting algorithm that utilizes a "divide and conquer" technique to sort arrays with optimal speed?
    A. Binary Search
    B. Bubble Sort
    C. Merge Sort
    D. Selection Sort
    E. Sequential Search

23. Which searching algorithm involves using a low, middle, and high index value to find the location of a value in a sorted set of data (if it exists)?
    A. Binary Search
    B. Bubble Sort
    C. Merge Sort
    D. Selection Sort
    E. Sequential Search

24. **True or False:** Binary searches can be performed on sorted and unsorted data.
    A. True
    B. False

25. **True or False:** A sequential search is an iteration through the array that stops at the index where the desired element is found.
    A. True
    B. False

26. **True or False:** Stacks are identical to Queues.
    A. True
    B. False

27. FIFO stands for:
    A. Fast In Fast Out
    B. Fast Interface Fast Output
    C. First In First Out
    D. First Interface First Output

28. Which statements, if inserted it at line 2, will ensure that the code snippet will compile successfully? (Choose Two)

```
1.  public static void main (String[]args)    {
2.  //insert code here
3.  s.put ("StudentID", 123);
4.  }
```

A. `ArrayList s= new ArrayList();`
B. `HashMap s= new HashMap();`
C. `Map s= new SortedMap();`
D. `SortedMap s= new TreeMap();`

29. **True or False:** A `HashMap` can only store String types.
A. True
B. False

30. **True or False:** The Comparable interface defines the `compareTo` method.
A. True
B. False

31. **True or False:** `< ? >` is an example of a bounded generic wildcard.
A. True
B. False

32. What is the result from the following code snippet?

```
public static void main(String[] args) {
List <Gum> list1 = new ArrayList<Gum>();
list1.add(new Gum());
List list2 = list1;
list2.add(new Integer(9));
System.out.println(list2.size());
}
```

A. `1`
B. `2`
C. An exception will be thrown at runtime
D. The code will not compile

33. Examine the code below. Which statement about this code is true?

```
class Shape { }
class Circle extends Shape { }
class Rectangle extends Shape { }
class Node <T> { }
public class Test{
public static void main(String[] args){
Node <Circle>nc = new Node<>();
Node <Shape>  ns = nc;
}
}
```

A. An error at line 4 causes compilation to fail
B. An error at line 7 causes compilation to fail
C. An error at line 8 causes compilation to fail
D. The code compiles

34. Which of the following correctly initializes an object named `cell` of the class `Telephones` whose generic type is `Cellular`?

A. `Telephones cell = new Telephones(Cellular c);`
B. `Telephones(Cellular) cell = new Telephones(Cellular);`
C. `Telephones<> cell = new Telephones<>(Cellular c);`
D. `Telephones<Cellular> cell = new Telephones<Cellular>();`
E. None of the above

35. `public static  void <T> printArray(T[] array){....`

is an example of what?

A. A concreate method
B. A generic class
C. A generic instance
D. A generic method

36. Which of these could be a set? Why?
    A. `{1, 1, 2, 22, 305, 26}` because a set may contain duplicates and all its elements are of the same type
    B. `{1, 2, 5, 178, 259}` because it contains no duplicates and all its elements are of the same type
    C. `{"Apple", 1, "Carrot", 2}` because it records the index of the elements with following integers
    D. All of the above are sets because they are collections that can be made to fit any of the choices

37. Which interface forms the root of the collections hierarchy?
    A. `java.util.Collection`
    B. `java.util.Collections`
    C. `java.util.List`
    D. `java.util.Map`

38. **True or False:** A `HashSet` is a set that is similar to an `ArrayList`. A `HashSet` does not have any specific ordering.
    A. True
    B. False

39. **True or False:** Sets may contain duplicates.
    A. True
    B. False

Section 4

40. Consider the following recursive method `recur(x, y)`. What is the value of `recur(4, 3)`?

```
public static int recur(int x, int y) {
if (x == 0) {
    return y;
}
    return recur(x - 1, x + y);
}
```

A. `9`
B. `10`
C. `12`
D. `13`

41. Which two statements can create an instance of an array? (Choose Two)

A. `char[] ca = "java";`
B. `double da = new double [5];`
C. `int[] ia = new int [5];`
D. `int ia[][] = (1,2,3) (4,5,6);`
E. `Object oa = new double[5];`

42. Which case handles the last recursive call?

A. The base case
B. The convergence case
C. The primary case
D. The recursive case
E. The secondary case

43. A linear recursive method can call how many copies of itself?

A. 1
B. 2 or more
C. None

44. Which of the following method(s) are `StringBuilder` methods?
    A. `append`
    B. `delete`
    C. `insert`
    D. `replace`
    E. All of the above

45. What class is the `split()` method a member of?
    A. Array
    B. Parse
    C. String
    D. `StringBuilder`

46. Identify the method, of those listed below, that is not available to both `StringBuilders` and Strings?
    A. `charAt(int index)`
    B. `delete(int start, int end)`
    C. `indexOf(String str)`
    D. `length()`

47. **True or False:** Matcher has a find method that checks if the specified pattern exists as a sub-string of the string being matched.
    A. True
    B. False

48. Which of the following correctly initializes a `Matcher m` for Pattern `p` and String `str`?
    A. `Matcher m = new Matcher();`
    B. `Matcher m = new Matcher(p,str);`
    C. `Matcher m = p.matcher(str);`
    D. `Matcher m = str.matcher(p);`

49. Which of the following correctly defines a repetition operator?
    A. A method that returns the number of occurrences of the specified character
    B. A symbol in regular expressions that indicates the number of occurrences a specified character appears in a matching string
    C. A symbol that represents any character in regular expressions
    D. None of the above

50. Your teacher asks you to write a segment of code that returns true if String `str` contains zero or one character(s) and false otherwise. Which of the following code segments completes this task? (Choose Two)
    A.
```
if( str.length() == 0 || str.length() == 1)
{ return true;}
return false;
```
    B.
```
return str.matches("[a-z]*");
```
    C.
```
return str.contains(".");
```
    D.
```
return str.matches(".?");
```