INFO5100_Midterm

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✓

Points: 2/2

1. What is static block?

○ None of the above.

○ There is no such block.

○ It is used to create synchronized code.

● **It is used to initialize the static data member., It is executed before main method at the time of class loading. ✓**

✓

Points: 4/4

2. Which of the following statements about constructors is correct:

☑ **A constructor is responsible for the initialization of an object's instance fields. ✓**

☑ **A constructor has the same name as the class name. ✓**

☑ **Constructor methods have no return type. ✓**

☑ **A class can have several constructors. ✓**

✓

Points: 2/2

3. You can run the Java language on a particular operating system if

○ a compiler exists for that operating system

○ it's a Sun Microsystem Operating System

○ it's a Microsoft Operating System

● **a Java Virtual Machine exists for that operating system ✓**

✓

Points: 4/4

4. Suppose Book is an interface and classes Dictionary and Encyclopedia both implement Book.

Select all the valid statement

☑ **Book d = new Dictionary() ✓**

□ Book b = new Book()

□ Encyclopedia e = new Book()

✓

Points: 2/2

5. What is the default value of String variable?

● **null ✓**

○ ""

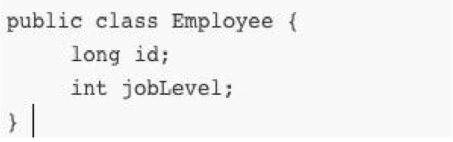
○ not defined

○ false

✓

Points:
2/2

6. In the following code segment, how do you convert jobLevel so that it is private and accessed via setters and getters.



```
public class Employee {
     long id;
     int jobLevel;
}
```

● **public class Employee {**
    private long id;
    private int jobLevel;
    void setJobLevel (int lev) {jobLevel = lev; }
    int getJobLevel () {return jobLevel; }
}

✓

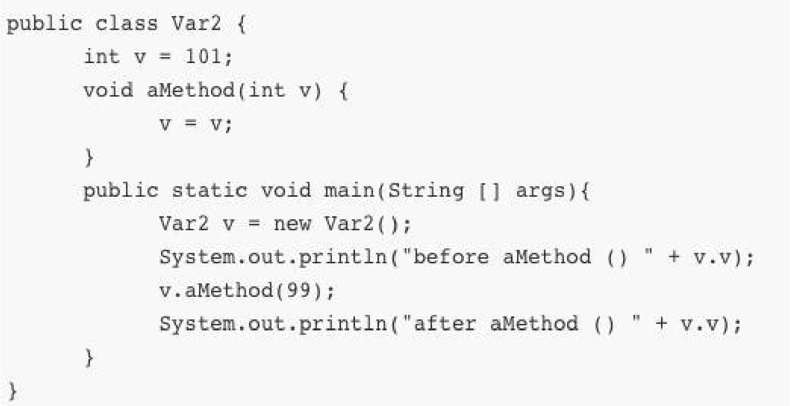
○ public class Employee {
    long id;
    int jobLevel;
    void setJobLevel (int lev) {jobLevel = lev; }
    int getJobLevel () {return jobLevel; }
}

○ public class Employee {
    private long id;
    private int jobLevel;
    void setJobLevel (int lev) {jobLevel = lev; }
    void getJobLevel () {return jobLevel; }
}

✓

Points:
2/2

7. What does the second println() statement print?



```
public class Var2 {
      int v = 101;
      void aMethod(int v) {
            v = v;
      }
      public static void main(String [] args){
            Var2 v = new Var2();
            System.out.println("before aMethod () " + v.v);
            v.aMethod(99);
            System.out.println("after aMethod () " + v.v);
      }
}
```

● **101** ✓

○ 100

○ 98

○ 99

✓

Points:
2/2

8. Given the following:

```
class Student{
  static int id;
  int age;
  String name;
  Student(String s, int i) {
    ++id;
    name = s;
    age = i;
  }
}

class Test{
  private Student change(Object o) {
    Student s2 = (Student)o;
    s2.age = 25;
    return s2;
  }
  public static void main(String[] args) {
    Student s1 = new Student("John", 22);
    Test te = new Test();
    Student s2 = te.change(s1);
    System.out.println(s2.id + " " + s2.name + " " + s2.age);
    System.out.println(s1.id + " " + s1.name + " " + s1.age);
  }
}
```

○ Compilation fails

○ 2 John 25 1 John 25

○ 2 John 25 1 John 22

○ 1 John 25 1 John 22

● **1 John 25 1 John 25** ✓

✓

Points:
4/4

9. In Java8, Which of the following return true?

☑ **"join".equals(new String("join"))** ✓

□ "join" == new String("join")

☑ **"join".equals("join")** ✓

☑ **"join" == "join"** ✓

✓

Points: 2/2

10. Given the following

```
class Test{
  static int a = 10;
  public static void main(String[] args) {
    for (int a = 0; a < 5; a++){

    }
    System.out.print(a);
  }
}
```

What is the output?

○ 4

○ 5

● **10 ✓**

○ A runtime exception will be thrown.

○ Compilation fails

✓

Points: 2/2

11. Which of the following is true about protected access modifier?

○ Variables, methods and constructors which are declared protected can be accessed by any class.

○ Variables, methods and constructors which are declared protected in the superclass can be accessed only by its child class.

● **Variables, methods and constructors which are declared protected can be accessed by any class lying in same package.**
✓

○ None of the above.

✓

Points: 2/2

12. Which of the following lines will print false?

```
public class Quiz5 {
static String s1 = "I am unique!";
public static void main(String args[]) {
String s2 = "I am unique!";
String s3 = new String(s1);
System.out.println("line1 " + s1 == s2);
System.out.println("line2 " + s1.equals(s2));
System.out.println("line3 " + s3 == s1);
System.out.println("line4 " + s3.equals(s1));
System.out.println("line5 " + TestClass.s4 == s1);
}
}
class TestClass {
static String s4 = "I am unique!";
}
```

○ none of there

○ lines 1 and 3

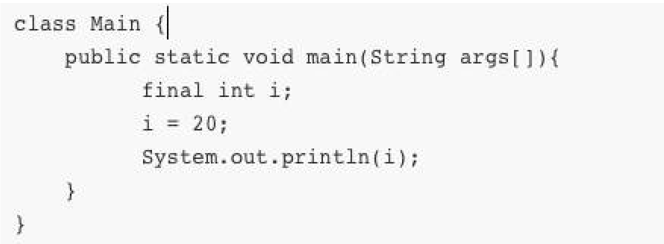
○ lines 2 and 4

● **lines1, 3, and 5 ✓**

✓

Points: 2/2

13. What is the output of it?



```
class Main {
    public static void main(String args[]){
          final int i;
          i = 20;
          System.out.println(i);
    }
}
```

○ 20

● **Compile error** ✓

○ 0

✓

Points: 2/2

14. Which of the following is true about super class?

○ Variables, methods and constructors which are declared private can be accessed only by the members of the super class.

○ Variables, methods and constructors which are declared protected can be accessed by any subclass of the super class.

○ Variables, methods and constructors which are declared public in the superclass can be accessed by any class.

● **All of the above.** ✓

✓

Points: 2/2

15. What is the correct declaration of an abstract method that is intended to be public?

○ public abstract void add() {}

○ public virtual add();

○ public abstract add();

● **public abstract void add();** ✓

✓

Points: 2/2

16. What is true about a final class?

○ class declard final is a final class.

○ Final classes are created so the methods implemented by that class cannot be overridden.

○ It can't be inherited.

● **All of the above.** ✓

✓

Points: 2/2

17. Encapsulation is implemented by using

○ public

● **private** ✓

○ static

○ class

○ None of the above

✓

Points: 2/2

18. Predict the output of following Java program

```
import static java.lang.System.*;

class StaticImportDemo
{
   public static void main(String args[])
   {
        out.println("INFO5100");
   }
}
```

● **INFO5100 ✓**

○ Compiler Error

○ Runtime Error

✓

Points: 2/2

19. Given the following:

```
class Test{
  public static void main(String[] args) {
    int x = 10;
    int y = new Test().change(x);
    System.out.print(x + y);
  }
  int change(int x) {
    x = 12;
    return x;
  }
}
```

What is the result?

○ Compilation fails.

○ An exception is thrown at runtime.

● **22 ✓**

○ 24

○ 20

✓

Points: 4/4

20. The final keyword can be used to (Select all that apply):

☑ **To prevent method overriding ✓**

☑ **To define symbolic constants ✓**

☑ **To prevent the extension of the class ✓**

□ To prevent method overloading

✓

Points: 2/2

21. Given the following:

```
int[] a = new int[]{0, 1, 2, 3, 4, 5};
int i = a.length - 1;
while(i >= 0) {
  System.out.print(a[i]);
  i--;
}
```

○ An exception could be thrown at runtime.

○ 01234

● **543210 ✓**

○ 012345

○ 54321

✓

Points: 4/4

22. Given the following:

A and E are classes

B and D are interfaces

C is an abstract class

Which statements are true? (Choose three)

- ☑ **class F extends E{ } ✓**
- □ class F extends A,E{ }
- ☑ **class F implements B{ } ✓**
- ☑ **class F implements B,D{ } ✓**
- □ class F implements B,C{ }

✓

Points: 2/2

23. Given the following:

```
class Test{
  public static void main(String[] args) {
    int a[] = {1, 2, 3, 4};
    System.out.print(a instanceof Object);
  }
}
```

- ○ Compilation fails due to error at line 4.
- ○ Compilation fails due to error at line 3.
- ● **Will produce output as true. ✓**
- ○ Length of this array is 3.
- ○ Will produce output as false.

✓

Points: 2/2

24. Which of the following statements is correct for a method which is overriding the following method?

public void add(int a) {...}

- ● **The overriding method must return void. ✓**
- ○ The overriding method must return int.
- ○ The overriding method can return whatever it likes.
- ○ All of the above.

✓

Points: 2/2

25. Given the following:

```
class Test {
  int a = 10;
  public static void main(String[] args) {
    new Test().print();
  }
  public void print() {
    int a = 8;
    System.out.print(a + " ");
  }
}
```

What is the output?

- ○ Compilation fails.
- ○ 18
- ● **8 ✓**
- ○ Output is unpredictable.
- ○ 10

✓

Points:
5/5

26. Predict the System.out.println() **output for each of the following statements**

"Tomorrow".substring(3,5) or ✓

'a' + 1 == 'b' true ✓

'z' – 'a' 25 ✓

"Tomorrow" == new String("Tomorrow") false ✓

"Tomorrow".equals(new String("Tomorrow")) true ✓

✓

Points:
2/2

27. Override methods must call the parent method with super as the first line

○ True

● **False** ✓

✓

Points:
2/2

28. In Java, you can extend either the Exception or RuntimeException class to create your own exceptions.

○ False

● **True** ✓

✓

Points:
2/2

29. An Interface can extend more than one interface.

● **True** ✓

○ False

✓

Points:
2/2

30. A class in Java can have multiple parents

○ True

● **False** ✓

✓

Points:
2/2

31. Abstract class can define both abstract methods and non-abstract methods

● **True** ✓

○ False

✓

Points:
2/2

32. What is the difference between constructors and other methods?[2pt]

Constructors must have the same name as the class and can not return a value.
They are only called once which regular methods could be called many times.

✓

Points:
2/2

33. Show the code to create an object named myObject by instantiating a class called MyClass and passing the constructor a String literal "hello" as the argument.[2pt]

MyClass myObject = new MyClass("hello"); ✘

Correct answer:✓
MyClass myObject = new MyClass("hello"); ✓

✓

Points:
2/2

34. What is the difference between abstract classes and interfaces?[2pt]

An abstract class can have instance methods that implement a default behavior. An interface can only declare constants and instance methods, but cannot implement default behavior and all methods are implicitly abstract. An interface has all public members and no implementation.

✓

Points:
4/4

35. Extend the code shown below to handle the IOException that can occur when opening a file that does not exist. (You can simply print out a message)You do not have to add the import that is needed for the exception. [4pt]

```
public void readFile(String filename) {
    File file = new File(filename);
    Scanner scan = new Scanner(file);
}
```

```
   try{
   File file = new File(filename);
   Scanner scan = new Scanner(file);
   } catch (IOException e) {
   System.out.println("Cannot open file: " + filename);
 }
```

✓

Points:
15/15

36. Coding Challenge[15pt]

This part you can use your own IDE to write the code and paste to here.

```
Given an array nums and a value val, remove all instances of that value and return the new length.

1. Do not allocate extra space for another array, you must do this by modifying the input array in place with O(1) e
xtra memory.
2. The order of elements can be changed.
3. It doesn't matter what you leave beyond the new length.
```

Example1:

```
Input: nums = [3,2,2,3], val = 3
Output: 2, nums = [2,2]
Explanation: Your function should return length = 2, with the first two elements of nums
being 2.
It doesn't matter what you leave beyond the returned length. For example if you return 2
with nums = [2,2,3,3] or nums = [2,3,0,0], your answer will be accepted.
```

Example2:

```
Input: nums = [0,1,2,2,3,0,4,2], val = 2
Output: 5, nums = [0,1,4,0,3]
Explanation: Your function should return length = 5, with the first five elements of nums
containing 0, 1, 3, 0, and 4. Note that the order of those five elements can be arbitrary.
It doesn't matter what values are set beyond the returned length.
```

Please follow the same input and output as below.

```
  public int removeElement(int[] nums, int val) {


  }
```

```
Class Solution {
   public int removeElement(int[] A, int elem) {
      int m = 0;
      for (int i = 0; i < A.length; i++) {
         if (A[i] != elem) {
            A[m] = A[i];
            m++;
         }
      }
      return m;
   }
}
```