Computer Science Introductory Course (Fall 2003) - Java Exam

If you are asked to write some code, do it so that it would compile and be self-sufficient, unless a small excerpt is asked.

I. For the multiple-choice-questions, you can choose one of more answers, unless specified differently. Write the letters of the answers for each question in the table on the 7th page (for example for the first question, 1 a, b, c).

1) Choose all the valid answers below:

a. /* this is a comment*/
   package mypackage;
   class MyClass { }
b. import java.awt.*;
   package mypackage;
   class MyClass {}
c. package mypackage;
   import java.awt.*;
   class MyClass { }
d. class MyClass { }
   import java.awt.*;

2) Which of the following statements are true?

a. Garbage collection will run by calling System.gc().
b. JVM runs garbage collection as a low-priority thread.
c. Garbage collection will run by setting all the references to the object to null.
d. Garbage collection can be scheduled by code.

3) Which of the following statements are valid?

a. public static void main(String args)
b. void public static main(String args [])
c. static public void main(String message[])
d. public static void Main(String [] arg)
e. public static void main()

4) Which of the following are valid Java keywords?

a. integer
b. null
c. then
d. main
e. class

5) Which of the following statements are true?

```
public class Base {
  static int i;
  public static void main(String args[]) {
  System.out.println( "i = " + i);
  }
```

```
}
```

a. The code does not compile because integer i cannot be used before initialization.
b. The code does not compile because static methods cannot access static variables.
c. The code compiles and print out nothing.
d. The code compiles and print out "i = 0"

6) Which access modifier of variable may not be changed once initialized? Give the modifier.

7) Which of the following statements are illegal statements?

a. public protected void myMethod() {}
b. native void myMethod() {}
c. private synchronized void myMethod() {}
d. abstract void myMethod(void);
e. private final int myMethod() {return 0;}

8) Given the code below, if you want any methods in the same package of the class Base can access the variable i, but not the methods in other package, which access modifier is the most suitable one ?

```
class Base {
  int i;
}
```

a. private
b. protected
c. public
d. nothing
e. friendly

9) Given the code below. Which of the following statements will not cause an error or throw an exception?

```
class Base {
  String s;
  public static void main(String args[]) {
  Base b = new Base();
  if //put the answer here
  System.out.println(b.s);
  }
}
```

a. ((b.s != null) && (b.s.length() > 0))
b. ((b.s != null) & (b.s.length() > 0))
c. ((b.s == null) || (b.s.length() > 0))
d. ((b.s == null) | (b.s.length() > 0))

10)Giving the code below, which of the following statements are true? Choose the most suitable one.

```
class Base {
  public static void main(String args[]) {
    Base b = new Base();
    System.out.println(b.myMethod());
  }

  public int myMethod() {
    int intarray [] = new int [10];
    for (int i = 0; i < intarray.length; i++)
      System.out.println(intarray[i]);
    return i;
  }
}
```

a. The code will not compile.
b. The code will throw an exception because the array does not initialize before use.
c. The code will throw an exception - 'ArrayIndexOutOfBoundsException'.
d. The code compile and run, print 10 "0" followed by "9".
e. The code compile and run, print 10 "0" followed by "10".

11)Giving the code below, which of the following statement is true? Choose the most suitable one.

```
class Base {
  public static void main(String args[]) {
  System.out.println(args[1]);
  }
}
```

Consider the following command line:
Java Base Hello

a. The code will not compile.
b. The code will throw an exception.
c. The code will compile and run, print out "Base".
d. The code will compile and run, print out "Hello".

12)Giving the code below, which of the following statement is true? Choose the most suitable one.

```
1. public class Animal {
2. }
3.
4. class Cat extends Animal {
5. }
6.
7. class Dog extends Animal {
8. }
9.
10.class Test {
11 public static void main(String args[])
12 {
```

```
13. Animal a = new Animal();
14. Cat c = new Cat();
15. Dog d = new Dog();
16. a = c;
17. d = (Dog)a;
18. }
19. }
```

a. The code will not compile.
b. The code will compile but will throw an exception at line 16.
c. The code will compile but will throw an exception at line 17.
d. The code will compile and run.

13)Which line in the following code will not compile?

```
1. short s = 20;
2. int i = 88;
3. double d = 28.8;
4. boolean b = true;
5. d = s;
6. i = b;
7. d = i;
8 s = d;
```

a. line 5
b. line 6
c. line 7
d. line 8

14)Giving the code below, which of the following statements will print out "Less than 0"?

```
if ( x > 2 ) {
  System.out.println("Greater than 2");
}
else {
  if ( x > 5 ) {
    System.out.println("Greater than 5");
  }
  else {
    System.out.println("Less than 0");
  }
}
```

a. x = -0
b. x = 2
c. x = -2
d. x = 5

15)Which of the following are valid statements?

a. throw IOException;
b. throws new IOException();

c. throw new IOException();
d. throw new IOException("fie not found");
e. throws new IOException("fie not found");
f. throw "file not found";

16)Giving the code below, which of the following statements are true?

```
public class Base {
  public static void main(String args[] ) {
    Base b = new Base();
    b.myMethod();
  }

  public static void myMethod() {
    this(0,0);
  }

  public void myMethod(float f, int i) {
    System.out.println(" f = " + f + " i = " + i);
  }
}
```

a. The code will not compile because 'this()' may only be called within a non-static method.
b. The code will not compile because 'this()' may only be called within a constructor.
c. The code will not compile because 'main()' method cannot call static method by instance.
d. The code will throw an exception.
e. The code will compile and run, print out "f = 0.0 i = 0".

17)Which of the following statements are true?

a. An inner class can be declared as static.
b. An inner class can have the same name as the enclosing class.
c. A class defined inside a method can access final variables of the enclosing method.
d. A class defined inside a method can be declared as static.

18)Which of the following statements are true?

a. An anonymous inner class can have a constructor.
b. An anonymous inner class can implement interface.
c. An anonymous inner class is not supposed to be very long.

19)Giving the following code, which of the following statement is true? Choose the most suitable one.

```
class Base {
  public void Base() {
    System.out.println("Base");
  }
}
```

```
public class Sub extends Base {
  public static void main(String args[]) {
    Sub s = new Sub();
  }
  public Sub () {
    System.out.println("Sub");
  }
}
```

a. The code will not compile.
b. The code will throw an exception.
c. The code will compile and run, print out "Base" followed by "Sub"
d. The code will compile and run, print out "Base"
e. The code will compile and run, print out "Sub"

20)Giving the following code, which of the following variables will be valid to refer at //here ?

```
public class OuterClass {
  private boolean b;
  int i;
  public void myMethod(float f, final short s) {
    double d = 2.0;
    class InnerClass {
      long l = 5;
      void innerMethod() {
        //here
      }
    }
  }
}
```

a. b
b. i
c. f
d. s
e. d
f. l

21)Giving the String s = "hello", which of the following statement is the result of s.substring(3,6)? Choose the most suitable one.

a. "llo"
b. "lo"
c. "lo "
d. The code will cause a compile error.
e. The code will throw an exception.

I. Table for the answers of the first exercise.

1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21

II. Giving the following code,

```
class Triangle {
  String color;
  int number;
  int[][] points;
}
```

Override the clone() method of this class so that it returns a real copy of a Triangle object.

III. Briefly compare the advantages of abstract classes and interfaces and highlight their differences.

IV. Give a full code example of the usefulness of dynamic method lookup and polymorphism. Create classes and use them to demonstrate these 2 important java mechanisms.