CSE 201 – Advanced Programming
Quiz 2: September 3, 2016

Name:

Roll No:

Note: Multiple options could be correct incase of MCQ. Marks: Each question carries 1 point unless mentioned with the question.

1. What will be the behavior of the following program? **(2 Marks)**

```
class A {}
	class B extends A {
		public static void
main(String args[]) {
		B b = (B) new A(); /*line 4
*/
	}
}
```

a) Run successfully.
b) Compile time error.
c) Run time error.
d) None of the above.

Ans: c, downcasting (Parent class object being cast to a child class object) is not always permitted in java. The code will actually compile but will throw an exception at run time. If you remove the cast, it will give a compile time error. Downcasting works, when there is a possibility that it can succeed at runtime. Otherwise, you have to manually perform downcasting.

2. Select appropriate output(s)

```
class Test {
	public static void main(String
args[]) {
		System.out.println(fun());
	 }
	static int fun(){
		static int x= 10;
`		return x--;
	}
}
```

a) Compiler Error
b) Prints "9"
c) Prints "10"
d) None of the above

Ans: a, static local variables are not allowed.

3. I argue that Java is not a pure Object Oriented Language. Justify. **(2 Marks)**

Ans: Many stuff like static methods etc can be called without objects. Also, java allows primitive data types like int, float, double, etc.

4. What should be added to the class Point for the program to run successfully?

```
class Point {
	protected int x, y;

	public Point(int _x, int _y) {
		x = _x;
		y = _y;
	}
}

public class Main {
	public static void main(String
args[]) {
		Point p = new Point();
		System.out.println("x = " +
p.x + ", y = " + p.y);
	}
}
```

Ans. (a) Default constructor should be added. Because, when we write our own parameterized constructor then java compiler doesn't create the default constructor.

5. What should be the output:

```
	int result = 0 ;
	Boolean b1 = new Boolean( "TRUE" );
	Boolean b2 = new Boolean( "true" );
	Boolean b3 = new Boolean( "tRuE" );
	Boolean b4 = new
```

```
Boolean( "false" );
        if (b1 == b2)
                result = 1 ;
        if (b1.equals(b2) )
                result = result + 10 ;
        if (b2 == b4)
                result = result + 100 ;
        if (b2.equals(b4) )
                result = result + 1000 ;
        if (b2.equals(b3) )
                result = result + 10000 ;
        System.out.println( "result = " +
        result);
```

Ans: 10010, because boolean is case insensitive.

6. Which of the following statements are true about polymorphism?

a) polymorphism is a process in which a call to an overridden method is resolved at runtime rather than at compile-time.
b) polymorphism is a process in which a call to an overloaded method is resolved at runtime rather than at compile-time.
c) Both of the above.
d) None of the above.

Ans: a

7. What is byte code in the context of Java?
a) The type of code generated by a Java compiler
b) The type of code generated by a Java Virtual Machine
c) It is another name for a Java source file
d) It is the code written within the instance methods of a class.
e) It is another name for comments written within a program.

Ans: a

8. When is the *Float* object, created in line 3, eligible for garbage collection?

```
public Object m()
{
        Object o = new Float(3.14F);
        Object [] oa = new Object[1];
        oa[0] = o;              /* Line 5 */
        o = null;               /* Line 6 */
        oa[0] = null;           /* Line 7 */
        return o;               /* Line 8 */
}
```

a) Just after line 5
b) Just after line 6
c) Just after line 7
d) Just after line 8

Ans: c, after line 5 oa[0] refers the *float* object created in line 3. But, in line 7 oa[0] is assigned to null and therefore *float* object is then eligible for garbage collection.

9. What is variable hiding in Java? **(2 Marks)**

Ans: When you declare the instance variable again in child class which hides variable in parent class.

10. Which of these is necessary condition for automatic type conversion in Java?

a) The destination type is smaller than source type.
b) The destination type is larger than source type.
c) The destination type can be larger or smaller than source type.
d) None of the mentioned

Ans: b, e.g. float var = 10. var will have 10.0. Its also called widening casting or implicit casting.

11. What is the output of the following program

```
 class A {
        public int i;
        protected int j;
}

class B extends A {
        public int j;
        void display() {
                super.j = 3;
                System.out.println(i + " " +
         j);
        }
}

class Output {
        public static void main(String
args[])
        {
                B obj = new B();
                obj.i=1;
                obj.j=2;
```

```
            obj.display();
        }
}
```

a) 1 2
b) 2 1
c) 1 3
d) 3 1

Ans: a, it would have been 1 3 if the program had super.j in the print statement.

12. Which are valid declarations within an interface definition?

a) public double methoda();
b) public final double methoda();
c) static void methoda(double d1);
d) protected void methoda(double d1);

Ans: a

13. Below code shows compile time error. Can you suggest the corrections?

```
class X
{
        public X(int i)
        {
                System.out.println(1);
        }
}

class Y extends X
{
        public Y()
        {
                super(10);
                System.out.println(2);
        }
}
```

Ans: Gives compiler time error. Solution is adding super(<int value>) above the println statement in the constructor Y().

14. What is the output of the following program: **(2 Marks)**

```
public class CanWeOverrideStaticMethod {
        public static void main(String
args[]) {
                Screen scrn = new
ColorScreen();
                scrn.show();
         }
}

class Screen {
        public static void show() {
        System.out.printf("Static method
from parent class");
        }
}

class ColorScreen extends Screen {
        public static void show(){

        System.err.println("Overridden
static method in Child Class in Java");

        }
}
```

Ans: Static method from parent class

15. What is the output of this program?

```
        String s1 = "Hello i love java";
        String s2 = new String(s1);
        System.out.println((s1 == s2) + " "
+       s1.equals(s2));
```

a) true true
b) false false
c) true false
d) false true

Ans: d, **==** checks if the two variables refer to the same object and **equals** actually checks the content within the variables.

16. What is the result of compiling and running the following code?

```
public class Tester{
        static int x = 4;
        int y = 9;

        public Tester() {
                System.out.print(this.x); //
line 1
                printVariables();
        }

        public static void printVariables()
        {
                System.out.print(x); // line
2               System.out.print(y); // line
3
        }

        public static void main(String...
args) { // line 4

                new Tester();
        }
}
```

a) Compile error at line 1 (static x must be only accessed inside static methods)

b) Compile error at line 3 (static methods can't make reference to non-static variables)
c) Compile error at line 4 (invalid argument type for method main)
d) 49
d) Compile error at line 2 (must access x by writing Tester.x)

Ans: b

17. Can you create a sub class to the following class? **(2 Marks)**

```
Class A{
        private A() {}

        public A(int i) {}
}

class B extends A {

        public B()
        {
                super(10);
        }
}
```

Ans: Yes. You should explicitly call super(int) in the child class.