

**Please fill in your Student Number and Name.**

Student Number : \_\_\_\_\_

Name:  
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Student Number:  
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**University of Cape Town ~ Department of Computer Science**  
**Computer Science 1015F ~ 2008**  
**Test 3**

<b>Question</b>	<b>Max</b>	<b>Mark</b>	<b>Internal</b>	<b>External</b>
1	15			
2	15			
<b>TOTAL</b>	<b>30</b>			

**Marks : 30**  
**Time : 40 minutes**  
**Instructions:**

- a) Answer all questions.
- b) Write your answers in the space provided.
- c) Show all calculations where applicable.

## Question 1 [15]

- a) What do you call the process of converting from a value of primitive type to a corresponding object of its associated wrapper class? [1]

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- b) When you use the assignment operator with variables of a class type, will you be assigning a: [1]

- i. value?
- ii. primitive type?
- iii. local variable?
- iv. reference?

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- c) Consider the following array:

myArray[0]	7
myArray[1]	9
myArray[2]	-3
myArray[3]	6
myArray[4]	1
myArray[5]	-1

What is the value of `myArray[myArray[1] - myArray[0]]` ? [1]

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- d) Which of the following initializer lists correctly initializes the indexed variables of an array named `myDoubles`? [1]

- i. `double myDoubles[double] = {0.0, 1.0, 1.5, 2.0, 2.5};`
- ii. `double myDoubles[5] = new double(0.0, 1.0, 1.5, 2.0, 2.5);`
- iii. `double[] myDoubles = {0.0, 1.0, 1.5, 2.0, 2.5};`
- iv. `array myDoubles[double] = {0.0, 1.0, 1.5, 2.0, 2.5};`

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i) Which one of the following is the correct syntax for passing an array as an argument in a method [1]

- i. a[]
- ii. a()
- iii. a
- iv. a[0]..a[a.length]

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**Question 2 [15]**

a) Match each of the following terms to the concepts below: [2]

**overriding, overloading, inheritance, composition**

- \_\_\_\_\_ variables and methods automatically exist in the subclasses of a base class
- \_\_\_\_\_ methods in base class and subclass with same signature but different code
- \_\_\_\_\_ methods in base class and subclass with same name but different signature
- \_\_\_\_\_ a class has an instance variable which is itself an Object

b) Suppose that a 2-dimensional array `sales` has been declared as below. [4]

```
int[ ][ ] sales ;
```

Give Java code to fill `sales` with 1200 zeroes: there must be 100 rows each with 12 elements, and every element must be initialised to 0

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c) The program has changed the values in `sales` to contain monthly sales data from 100 shops. Give Java code to print monthly totals – i.e. print the sum of the values in each column of `sales`. The 12 values should appear one after the other on the same single line of output. [4]

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d) Consider the classes below, then give the output of the main program on the next page: [5]

```
public class Person
{
    protected String name;
    protected String address;
    public Person( )
    {
        name = "unknown"; address = "N/A";
        System.out.println("Created unknown person");
    }
    public Person( String pname, String adr )
    {
        name = pname; address = adr;
        System.out.println("Created person");
    }
}

public class Child extends Person
{
    int age;
    public Child (String cname, String adr, int years )
    {
        super ( cname, adr );
        age = years;
        System.out.println("Created child");
    }
    public Child ( )
    {
        age = 0;
        System.out.println("Created unknown child");
    }
    public String toString( )
    {
        return (name + " ( " + address + ") aged " + age);
    }
}
```

// please turn over for the rest of this question

```
public class Test
{
public static void main ( String args[ ] )
{
    Child ann = new Child( "ann", "UCT", 6);
    Child kiddie = new Child( );
    System.out.println( kiddie );
}
```

Output from running Test is:

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