



UNIVERSITY OF COLOMBO, SRI LANKA



UNIVERSITY OF COLOMBO SCHOOL OF COMPUTING

DEGREE OF BACHELOR OF INFORMATION TECHNOLOGY (EXTERNAL)

*Academic Year 2004/2005 – 1<sup>st</sup> Year Examination – Semester 1*

***IT1202: Fundamentals of Programming***

**26<sup>th</sup> February 2005  
(TWO HOURS)**

**Important Instructions :**

- The duration of the paper is **2 (two) hours**.
- The medium of instruction and questions is English.
- The paper has **45 questions** and **15 pages**.
- All questions are of the MCQ (Multiple Choice Questions) type.
- All questions should be answered.
- Each question will have 5 (five) choices with **one or more** correct answers.
- All questions will carry equal marks.
- There will be a penalty for incorrect responses to discourage guessing.
- The mark given for a question will vary from -1 (*All the incorrect choices are marked & no correct choices are marked*) to +1 (*All the correct choices are marked & no incorrect choices are marked*).
- Answers should be marked on the special answer sheet provided.
- Note that questions appear on both sides of the paper.  
If a page is not printed, please inform the supervisor immediately.
- Mark the correct choices on the question paper first and then transfer them to the given answer sheet which will be machine marked. **Please completely read and follow the instructions given on the other side of the answer sheet before you shade your correct choices.**

1) Java is

- (a) a small programming language.
- (b) a secure programming language.
- (c) a general purpose programming language.
- (d) an object oriented programming language.
- (e) a programming language which can be used to write application programs and applets.

2) Select the correct statement(s) from among the following.

- (a) Java language was developed at Sun Microsystems.
- (b) Java language was developed in 1991.
- (c) Java language was written by James Bond.
- (d) The initial name given for Java is Oak.
- (e) The project which developed Java is called Grand project.

3) Consider the following program written in Java.

```
class Three{  
public static void main(String three[])  
    {  
        System.out.println("Hello");  
    }  
}
```

Select from among the following, a suitable name which can be used as the source file name.

- |                 |                 |
|-----------------|-----------------|
| (a) Hello.java  | (b) three.java  |
| (c) Three.java  | (d) Three.class |
| (e) three.class |                 |

4) Java Bytecode is

- (a) the Java virtual machine version of machine code.
- (b) known as the Java interpreter or Java run time.
- (c) a set of programming statements entered into a text editor by a programmer.
- (d) similar to machine code which is not specific to any processor.
- (e) an additional layer in-between the source code and the machine code.

5) Breaking down a large complex procedure into a number of smaller procedures is referred to as

- |                          |                             |                             |
|--------------------------|-----------------------------|-----------------------------|
| (a) data structures.     | (b) top down decomposition. | (c) structured programming. |
| (d) modular programming. | (e) amateur programming.    |                             |

6) Which of the following statements is/are correct about Java documentation comments?

- (a) Java documentation comments occur within /\* and \*/ notations.
- (b) The output of the process of javadoc utility is a web page.
- (c) Java documentation comments could be written only in a single line.
- (d) When creating a runnable version of Java source file, the Java compiler ignores comments of document type.
- (e) Java documentation comments are interpreted to be official documentation on how classes and their public methods work.

- 7) Consider the following statements on global data.

Global data

- (i) can be accessed by a number of procedures.
- (ii) is defined within an outer procedure and may then be shared by the inner procedure.
- (iii) encourages the need to pass the data from one procedure to another.
- (iv) causes inconsistencies when shared by procedures.

Choose the incorrect statement(s) from among the above.

- |                              |  |
|------------------------------|--|
| (a) Only (i) is incorrect.   | (b) Only (i) and (ii) are incorrect.   |
| (c) Only (ii) is incorrect.  | (d) Only (iii) and (iv) are incorrect. |
| (e) Only (iii) is incorrect. |  |

- 8) Consider the following variable declarations.

```
int i;  
float j;  
boolean k;
```

Which of the following is/are correct initialization(s)?

- |                                       |                                      |  |
|---------------------------------------|--------------------------------------|--|
| (a) i = 1;<br>j = 1.0;<br>k = true;   | (b) i = 1;<br>j = 1.0f;<br>k = true; | (c) i = 1;<br>j = 1.0f;<br>k = "true"; |
| (d) i = 1;<br>j = 1.0;<br>k = "true"; | (e) i = 1;<br>j = 1.0f;<br>k = True; |  |

**Use the following declarations and initializations to evaluate the Java expressions given in Questions 9 to 11. (Please note that each expression has been tested separately.)**

```
int i=3, j=7, k=11;
```

- 9)  $j + k \% i$

- |        |        |       |
|--------|--------|-------|
| (a) 9  | (b) 0  | (c) 7 |
| (d) 12 | (e) 10 |       |

- 10)  $++k - i + i + i++$

- |        |        |        |
|--------|--------|--------|
| (a) 16 | (b) 17 | (c) 14 |
| (d) 13 | (e) 15 |        |

- 11)  $j * k++ / 2$

- |          |          |        |
|----------|----------|--------|
| (a) 38.5 | (b) 42   | (c) 38 |
| (d) 42.0 | (e) 42.5 |        |

- 12) Which of the following operators is/are having higher precedence than the (%) modulus operator?

- |               |        |        |
|---------------|--------|--------|
| (a) new(type) | (b) && | (c) ++ |
| (d) ?:        | (e) [] |        |

- 13) Consider the following Java program.

```
public class MyClass {
    private int myVlaue = 5;
    public void printMyVlaue() {
        System.out.println(myVlaue);
    }
    public void setMyVlaue(int myVlaue) {
        System.out.println(myVlaue);
        this.myVlaue = myVlaue;
    }

    public static void main(String[] args) {
        MyClass myClass1 = new MyClass();
        myClass1.setMyVlaue(10);
        myClass1.printMyVlaue();
    }
}
```

Which of the following will the output be?

(a) 5	(b) 10	(c) 10
10	10	5
(d) 5	(e) 15	
5	5	

Consider the program illustrated below for answering Questions 14 and 15.

```
class IsProblem{
public static void main(String isProblem[]){
int j;
    while (!(j%16) == 0) {
        System.out.println(j);
        j += j;
    }
    System.out.println(j);
}
}
```

- 14) If errors exist in the program, identify them from among the following?

(a) Wrong usage of static keyword.	(b) Variable j is not initialized.
(c) Wrong usage of += operator.	(d) Condition, (!(j%16)==0) is wrong.
(e) Parameter isProblem[] is wrong.	

- 15) What would be the intended output of the program, assuming that all the errors are fixed and j = 16?

(a) 8	(b) 16	(c) 24
24		
(d) 16	(e) 40	
32		

- 16) Consider the following Java program written using an untitled notepad.

```
class ClassA {  
    public void print(String s) {  
        System.out.println(s);  
    }  
}  
  
public class Main {  
    public static void main(String[] args) {  
        ClassA a = new ClassA();  
        a.print("Hello");  
    }  
}
```

After the compilation, (a) valid file name(s) which can be related with the above Java program is/are

- |                     |                  |
|---------------------|------------------|
| (a) Main.class      | (b) Main.java    |
| (c) ClassA.java     | (d) ClassA.class |
| (e) Class main.java |                  |

- 17) Consider the following program while noting the missing variable declaration indicated by ?????? in the class Tree.

```
class Tree {  
    ??????  
    Tree() {  
        treeNo++;  
        System.out.println("Tree " + treeNo + " is created!");  
    }  
}  
  
public class Variable{  
    public static void main(String[] args) {  
        Tree t1 = new Tree();  
        Tree t2 = new Tree();  
        Tree t3 = new Tree();  
    }  
}
```

The output of the above program should turn out to be as shown below:

```
Tree 1 is created!  
Tree 2 is created!  
Tree 3 is created!
```

Select from among the following the correct variable declaration(s) required in the class Tree to get the above output on the console.

- |                            |                              |
|----------------------------|------------------------------|
| (a) int static treeNo = 0; | (b) int treeNo;              |
| (c) static int treeNo;     | (d) static final int treeNo; |
| (e) int treeNo = 0;        |                              |

- 18) Which of the following is a/are correct variable declaration(s) in Java?

- |                          |                     |               |
|--------------------------|---------------------|---------------|
| (a) 1stName              | (b) middleName      | (c) _values34 |
| (d) \$recievedForTsunami | (e) %spentOnVictims |               |

Consider the following Java program to answer Questions 19 – 22.

```
class ClassA{
    ClassA(){ System.out.println("ClassA() constructor");
    }
    void methodA(){}
}

class ClassB extends ClassA{
    ClassB(int i){ System.out.println("ClassB(int) constructor");
    }
    void methodB(){}
}

class ClassC extends ClassB{
    ClassC(int i){ super(i);
                    System.out.println("ClassC(int) constructor");
    }
    void methodC() {}
}
```

- 19) Consider the following additional program in which each variable declaration is done separately.

```
public class Main {
    public static void main(String[] args) {
        int x = 5;
        ??????
    }
}
```

If ?????? indicate(s) the missing object construction(s), from among the following identify them.

- |                                     |                                |
|-------------------------------------|--------------------------------|
| (a) ClassB b = new ClassB();        | (b) ClassB b = new ClassB(-1); |
| (c) ClassB b = new ClassB("Hello"); | (d) ClassA a = new ClassA(2);  |
| (e) ClassB b = new ClassB(2*x);     |                                |

- 20) Consider the following additional driver program.

```
public class Main {
    public static void main(String[] args) {
        ClassB b = new ClassB(1);
        ClassC c = new ClassC(2);
    }
}
```

Which of the following would the output be?

- |   |   |
|---|---|
| (a) ClassA() constructor<br>ClassB(int) constructor<br>ClassA() constructor<br>ClassB(int) constructor<br>ClassC(int) constructor | (b) ClassB(int) constructor<br>ClassA() constructor<br>ClassC(int) constructor<br>ClassB(int) constructor<br>ClassA() constructor |
| (c) ClassA() constructor<br>ClassB(int) constructor<br>ClassB(int) constructor<br>ClassC(int) constructor                         | (d) ClassB(int) constructor<br>ClassA() constructor<br>ClassC(int) constructor<br>ClassA() constructor                            |
| (e) ClassB(int) constructor<br>ClassC(int) constructor  |   |

- 21) Consider the following additional driver program.

```
public class Main {  
    public static void main(String[] args) {  
        ClassB b = new ClassB(1);  
        ClassC c = new ClassC(2);  
    }  
}
```

Which of the following is a/are valid method call(s) for objects b and c in the above program?

- |  |  |
|--|--|
| (a) b.methodC(); → not a valid method call<br>b.methodB(); → a valid method call<br>c.methodA(); → not a valid method call | (b) c.methodA(); → a valid method call<br>b.methodA(); → a valid method call<br>c.methodB(); → a valid method call     |
| (c) c.methodA(); → a valid method call<br>c.methodB(); → a valid method call<br>c.methodC(); → a valid method call         | (d) c.methodA(); → not a valid method call<br>b.methodB(); → a valid method call<br>c.methodB(); → a valid method call |
| (e) b.methodA(); → a valid method call<br>b.methodB(); → a valid method call<br>b.methodC(); → a valid method call         |  |

- 22) Assume, in addition, that one has included the following method in the classA.

```
protected void print(String s) {  
    System.out.println(s);  
}
```

and also the following method in classB:

```
public void printInt(int i) {  
    System.out.println("integer - " + i);  
}
```

If one wants to reuse the print method available in classA to construct the printInt method in classB, how is he going to modify his printInt method?

- |  |   |
|--|---|
| (a) public void printInt(int i) {<br>super.print("integer - " + i);<br>}                         | (b) public void printInt(int i) {<br>print("integer - " + i);<br>}      |
| (c) public void printInt(int i) {<br>ClassA a = new ClassA();<br>a.print("integer - " + i);<br>} | (d) public void printInt(int i) {<br>this.print("integer - " + i);<br>} |
| (e) public int printInt(int i) {<br>this.print("integer - " + i);<br>}                           |   |

- 23) Select from among the following, read and write methods which belong to data input and output streams.

- |  |                                      |
|--|--------------------------------------|
| (a) readBoolean(),writeBoolean(boolean)  | (b) readByte(),writeByte(byte)       |
| (c) FileInputStream(),FileOutputStream() | (d) readDouble(),writeDouble(double) |
| (e) readLong(),writeLong(long)           |                                      |

- 24) Consider the following statements on the exceptions class hierarchy and mark the incorrect statement(s).

- (a) Instances of Error class occur in a Java program because of code that is not very robust.
- (b) Run Time Exceptions are internal errors in the Java run time environment.
- (c) EOFException and FileNotFoundException are two sub classes of RuntimeException class.
- (d) Exceptions of either Error or RuntimeException classes do not have to be listed in the throws clause and they are called implicit exceptions.
- (e) IOExceptions are part of the java.lang package.

- 25) A user's manual of a software system should contain

- (a) a detailed description of the functions performed by the program.
- (b) the means by which the user supplies data to the program to be processed covering the format and the content with any restrictions on values.
- (c) a detailed description with examples of any output produced by the program.
- (d) the program as if written by the programmer including any memory maps, cross references etc..
- (e) the design documentation tools from which the programs have been written such as structure charts.

- 26) Select the correct statement(s) from among the following on Exceptions.

- (a) Exceptions are all instances of some exception class.
- (b) In Java, one can create one's own exception to deal with a problematic situation.
- (c) A new exception has to be inherited from some other exception in the Java hierarchy.
- (d) All user created exceptions should be a part of Error hierarchy.
- (e) Exception classes do not have constructors.

**Consider the following Java program to answer Questions 27 and 28. ( Please note that the line numbers marked on the left side of the program do not form a part of the program)**

Line numbers	Program statements
01	public class Main {
02	private String s;
03	Main() {
04	this.print("Main() constructor");
05	}
06	static void print(String s) {
07	System.out.println(s);
08	this.s = s;
09	}
10	String getLastPrint() {
11	return s;
12	}
13	public static void main(String[] args) {
14	Main m = new Main();
15	m.print("Hello");
16	Main.print("Hello World");
17	String last = m.getLastPrint();
18	}
19	}

Continued ...



27) Which of the following is an/are incorrect statement(s) about the above program?

- (a) There are two classes in the program called main and Main.
- (b) Line 06 indicates that, in the program there is a method called print and it is a class method.
- (c) Line 11 in the program shows a method call, the name of the method is return and the sending parameter is s.
- (d) In line 08, usage of this key word is wrong.
- (e) In line 14, declaration of instance variable m is of type Main.

28) What would be the output of the above program if it is executed?

- |                                   |                                   |
|-----------------------------------|-----------------------------------|
| (a) Hello                         | (b) Hello World                   |
| (c) Hello<br>Hello<br>Hello World | (d) Hello<br>Hello World<br>Hello |
| (e) error                         |                                   |

29) In Java, error conditions are managed by

- |   |  |
|---|--|
| (a) using String class.                         | (b) using different control structures.  |
| (c) using special language features in Java.    | (d) consistency checking in compile time |
| (e) using a set of extensible exception classes |  |

30) Which of the following is a/are correct class definition(s)?

- (a) 

```
public class Test {  
    void print(String s) {  
        System.out.println(s);    }  
    public static void main(String[] args) {  
        System.out.println("Hello");    }  
}
```
- (b) 

```
public class Test {  
    public static void main(String[] args) {  
        System.out.println("Hello");    }  
    void print(String s) {  
        System.out.println(s);    }  
}
```
- (c) 

```
public class Test {  
    void print(String s) {  
        System.out.println(s);    }  
    private static void main(String[] args) {  
        System.out.println("Hello");    }  
}
```
- (d) 

```
public class Test {  
    void print(String s) {  
        System.out.println(s);    }  
    public static final void main(String[] args) {  
        System.out.println("Hello");    }  
}
```
- (e) 

```
public class Test {  
    void print(String s) {  
        System.out.println(s);    }  
    public static int main(String[] args) {  
        System.out.println("Hello");    }  
}
```

Consider the following program written in Java to answer Questions 31 and 32.  
(Please note that the line numbers do not form a part of the program.)

Line Numbers	Program Statements
01	<code>class StringEx{</code>
02	<code>public static void main(String args[]) {</code>
03	
04	<code>String s1="University of Colombo";</code>
05	<code>String s2="hello";</code>
06	<code>String s3="HELLO";</code>
07	
08	<code>System.out.println(s1.substring(10,13));</code>
09	<code>System.out.println(s2.equalsIgnoreCase(s3));</code>
10	<code>}</code>
11	<code>}</code>

- 31) What would be the output of the statement indicated in line number 08 when the program is executed?

(a) University of Colombo	(b) error	(c) of
(d) Colombo	(e) ity	

- 32) What would be the output of the statement indicated in line number 09 when the program is executed?

(a) HELLO	(b) error	(c) of
(d) false	(e) true	

- 33) Consider the following program written in Java.

```
class User {
    private String userName;
    private int userType;

    public void setUserName(String s) {
        this.userName = s;
    }
    public void setUserType(int t) {
        this.userType = t;
    }
    public String getUserName() {
        return userName;
    }
    public int getUserType() {
        return userType;
    }
}

public class Main {
    public static void main(String[] args) {
        User u = new User();
        System.out.println(u.getUserName());
        System.out.println(u.getUserType());
    }
}
```

Which of the following is/are the output(s)?

Continued ...

(a) null null	(b) null 0	(c) error
(d) 0 null	(e) 0 0	

- 34) Consider the following segment of a Java program.

```
int x=1;
switch(x)
{
    case 0: System.out.println(x); break;
    case 1: System.out.println(x); break;
    case 2: System.out.println(x);
    default: System.out.println(x);
}
```

What will the output be when the above segment is executed as a program?

(a) 0 (d) 1 1	(b) 1 (e) error	(c) 2
---------------------	--------------------	-------

- 35) Consider the following program written in Java.

```
class Iteration{
public static void main(String args[])
{
    for(int i=0;i<5;i++)
    {
        System.out.println(i);
        if(i%2==0)
            System.out.println('\t');
    }
}
```

When the program is executed what would the outcome be?

(a) 0 1 2 3 4 5	(b) 0 1 2 3 4	(c) 01 23 4
(d) 0 1 2 3 4 5	(e) 0 1 2 3 4	

36) Consider the following statement written in Java.

```
FileInputStream myFile= new FileInputStream("scores.dat");
```

Select the incorrect statement(s) in relation to the above mentioned kind of streams in Java.

- (a) OutputStream is the super class of the FileInputStream class.
- (b) scores.dat is a name of a file which is passed as an argument to the FileInputStream constructor.
- (c) After creating a FileInputStream, one can call its read() method to read more than one byte of data from the stream.
- (d) One can write data through FileInputStream by calling write(int) method.
- (e) According to the above statement written in Java, when the FileInputStream is created in the memory, that instance name is called new.

37) Select the correct statement(s) from among the following on program testing.

- (a) After the desk checking of a program has indicated that its operations should be correct, the programmer will start discovering errors in the algorithm.
- (b) Data driven testing ensures that the program gives correct output for all input data on the basis of the principle of regarding the program as a "black box".
- (c) Live data contains real instances of the types of input which the program must process.
- (d) Testing interactive programs requires testing procedures to ensure that the program is well written to withstand the actions of the data entry operator in performing the required operation in any possible order.
- (e) Configuration management is very important in system testing to avoid the running of a previous version of a program to ensure that the corrected errors are incorporated into the system.

38) Consider the following Java applet program.

```
import java.awt.*;
import java.applet.*;

public class Applet1 extends applet {
    int i = 1, j = 2, k = 3, l = 4;
    boolean b = false;

    public void init() {
        i = j + 1;
        b = true;
        k = l - 2;
    }
    public void start() {
        j = i + 2;
    }
    public void stop() {
        j = k + 1;
    }
    public void destroy() {
        l = i + 5;
    }
}
```

Which of the following is the value of the variable *i* soon after the statement *b = true* and after pressing the restart option in the applet viewer?

- |       |       |       |
|-------|-------|-------|
| (a) 1 | (b) 2 | (c) 3 |
| (d) 4 | (e) 5 |       |

- 39) Consider the following program written in Java.

```
class For{
public static void main(String args[])
{
    for(int i=0; i<=2; System.out.println(i));
}
}
```

What would the output of the above program be when the program is executed?

(a) 0 1 2	(b) 2 1 0	(c) error
(d) 1 2	(e) 2 1	

- 40) Consider the following Java program.

```
class While{
    public static void main(String args[]){
        int x=0;
        while(x<=3) {
            System.out.println(x);
            if(x==2)
                continue;
            x++;
        }
    }
}
```

What would be the output of the above program if executed?

(a) 0 1 2 3	(b) 0 1 3	(c) 1 2 3
(d) error	(e) 2	

- 41) Consider the following program written in Java.

```
class Args{
    public static void main(String args[]) {
        System.out.println(args[0]);
        System.out.println(args[1]);
    }
}
```

The above program is supplemented with the following command line assuming that the program has been compiled without any errors.

```
java Args args zero one
```

What would the output be?

(a) Args args	(b) Args args	(c) args zero
(d) args zero	(e) zero one	

- 42) Consider the following program written in Java.

```
class DoWhile{
    public static void main(String args[])
    {
        int j=0;
        do{
            int k=7;
            System.out.println(k);
            k+=7;
            j++;
        }
        while(j<3);
    }
}
```

What would be the output of the program if it is executed?

(a) 7 8 9 (d) 7 15 22	(b) 7 7 7 (e) error	(c) 7 14 21
--------------------------------------	------------------------------	-------------------

- 43) Consider the following Java program.

```
class Arr1{
    public static void main(String args[]) {
        String[] Names={Sama,Devi,Farida};
        Names[2]=Ravin;
        for(int i=0;i<Names.length;i++)
            System.out.println(Names[i]);
    }
}
```

What would the output of the above program be if executed?

(a) Sama Devi Farida (d) error	(b) Sama Devi Farida Ravin (e) Sama Devi Ravin	(c) Sama Devi Ravin Farida
---	---	----------------------------------

- 44) Consider the following program written in Java.

```
class Arr{
    public static void main(String args[]){
        int arr[]=new int[5];
        for(int i=1;i<arr.length;i++)
            arr[i]=i;
        for(int j=0;j<arr.length;j++)
            System.out.println(arr[j]);
    }
}
```

What would the output of the program be if it is executed?

Continued ...

(a) 0 1 2 3 4	(b) error	(c) null 0 1 2 3
(d) 0 0 1 2 3	(e) 0 0 1 1 2	

45) Consider the following program written in Java.

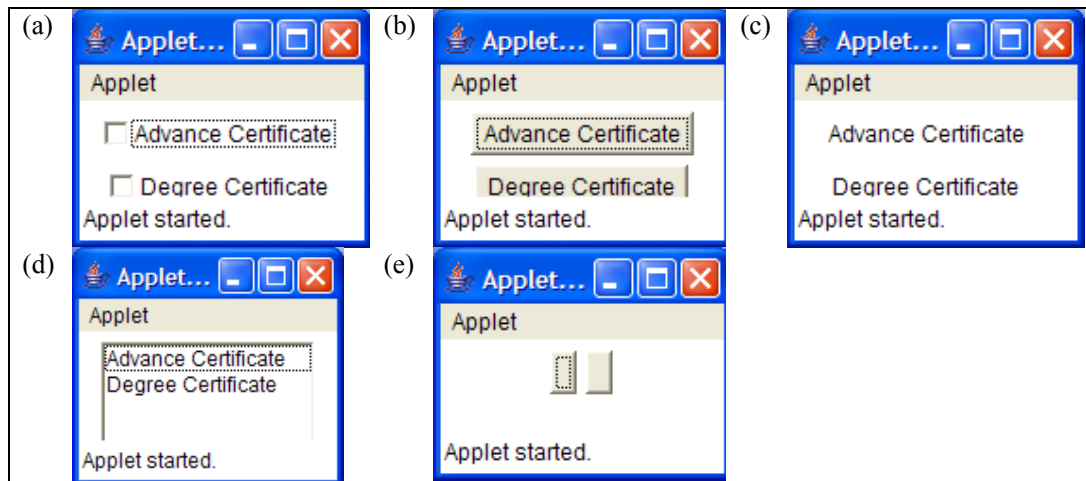
```
import java.awt.*;
import java.applet.Applet;

public class AwtEx extends Applet{
    Checkbox ch1=new Checkbox("Advance Certificate");
    Checkbox ch2=new Checkbox("Degree Certificate");
    public void init(){    add(ch1);    add(ch2);
    }
}
```

After compiling the program, the following set of codes is also written and saved separately by giving the name Awt.html.

```
<applet code="AwtEx.class" height=100 width=150> </applet>
```

What would be the outcome when appletviewer is invoked by providing the file Awt.html?



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