



UNIVERSITY OF COLOMBO, SRI LANKA

UNIVERSITY OF COLOMBO SCHOOL OF COMPUTING

DEGREE OF BACHELOR OF INFORMATION TECHNOLOGY  
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***IT2204 - Programming I***  
***28<sup>th</sup> July, 2012***  
***(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 **12 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 0 (*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) Consider the following streams of bits noting the blank indicated as **BLANK**. A bitwise operator which is denoted as **BLANK** applies to the input bit stream and then the output bit stream is generated.

Input Bit Stream	Operator	Output Bit Stream
01101100	<b>BLANK</b>	10010011

Select from among the following, the valid operator which has been applied for the above operation.

(a) ~	(b) &	(c)
(d) >> 1	(e) << 1	

- 2) Consider the following two numbers and bitwise operator indicated as **BLANK**. When the operator was applied as number1 operator number2, the following output number has been generated.

Number1	Operator	Number2	Output
5	<b>BLANK</b>	3	1

Select from among the following, valid operator which has been applied for the operation.

(a) ~	(b) &	(c)
(d) >> 1	(e) << 1	

- 3) Consider the following number and bitwise operator indicated as **BLANK**. When the operator was applied as number operator, the following output number has been generated.

Number	Operator	Output
3	<b>BLANK</b>	6

Select from among the following, valid operator which has been applied for the operation.

(a) ~	(b) &	(c)
(d) >> 1	(e) << 1	

- 4) Consider the following two numbers and bitwise operator indicated as **BLANK**. When the operator was applied as number1 operator number 2, the following output number has been generated.

Number1	Operator	Number2	Output
5	<b>BLANK</b>	3	7

Select from among the following, valid operator which has been applied for the operation.

(a) ~	(b) &	(c)
(d) >> 1	(e) << 1	

- 5) Consider the following number and bitwise operator indicated as **BLANK**. When the operator was applied as number operator, the following output number has been generated.

Number	Operator	Output
3	<b>BLANK</b>	1

Select from among the following, valid operator which has been applied for the operation.

(a) ~	(b) &	(c)
(d) >> 1	(e) << 1	

- 6) Select from among the following, valid operator(s) which can be categorized as unary type.

(a) ~	(b) &	(c)
(d) --	(e) ++	

- 7) Select from among the following, valid option(s) which can be considered keywords in Java.

(a) false	(b) static	(c) enum
(d) byte	(e) void	

- 8) Select from among the following, the company which bought the ownership of Java in 2010.

(a) Apple	(b) Oracle	(c) Sun Microsystems
(d) Microsoft	(e) Intel	

- 9) Consider the following program written in Java.

```
public class FirstProgram{
    public static void main(String args[]){

        System.out.println("Chamara Madushanka\n");
    }
}
```

Select from among the following, **incorrect** statement(s) related to the given program.

(a) The given program can be written in any text editor and execute.
(b) White spaces which appear in the program are ignored by the compiler.
(c) main() method composed of the words namely main, String and args,
(d) \n represents single line comments in Java.
(e) Program should be saved by giving the file name Chamara Madushanka.

Use the following declarations and initializations to evaluate the Java expressions given in questions 10 - 14. Assume that each expression is evaluated separately in the program.

```
int x = 0, y = 5, c = 4;
char ch = 'A'; // note that the ASCII value of A is 65
```

Select from among the given options, the correct output for each of the questions 10 – 14.

10) System.out.println(x = ++y);

- |       |           |       |
|-------|-----------|-------|
| (a) 3 | (b) 4     | (c) 5 |
| (d) 6 | (e) error |       |

11) System.out.println(++ch);

- |        |           |        |
|--------|-----------|--------|
| (a) A  | (b) B     | (c) 65 |
| (d) 66 | (e) error |        |

12) System.out.println(ch++);

- |        |           |        |
|--------|-----------|--------|
| (a) A  | (b) B     | (c) 65 |
| (d) 66 | (e) error |        |

13) System.out.println(x++ + ++x + y++ + c++);

- |        |           |       |
|--------|-----------|-------|
| (a) 5  | (b) 10    | (c) 9 |
| (d) 11 | (e) error |       |

14) System.out.println(y % c + ch);

- |        |           |        |
|--------|-----------|--------|
| (a) 66 | (b) A     | (c) 65 |
| (d) B  | (e) error |        |

Consider the following pool of Java statements to answer questions 15 – 20. Note that each statement is given a unique number as an identifier. In each question a problem is given and in order to solve that problem one has to write segments of Java programs according to the given instructions. It is not required to consider writing the class name or main method in the program. Answers for each option of questions 15 to 20 is given as a list of identifier numbers indicating the program statements.

Identifier	Java statements/Curly Brackets
1	{
2	}
3	final int kmConvertor = 1.609.0F;
4	final int yardsDivisor = 1760.0F;
5	int miles = 26.0F;
6	int yards = 385.0F;
7	double MarathonInKM = (miles * 1.609 + yards / 1760);
8	final float PI = 3.14F;
9	int radius = 5;
10	float areaOfCircle = PI * radius * radius;
11	System.out.println(areaOfCircle);
12	int radius = 5.0F;

13	int p = 100;
14	float r = 0.05F;
15	float r = 5%; int p = "Rs." +100;
16	int t = 1;
17	float i = p * r * t;
18	System.out.println("Rs."+ i);
19	int month = 2;
20	case 12: case 1: case 2:
21	case 3: case 4: case 5:
22	case 6: case 7: case 8:
23	case 9: case 10: case 11:
24	break;
25	switch ( month )
26	System.out.println("Winter");
27	System.out.println("Spring");
28	System.out.println("Summer");
29	System.out.println("Autumn");
30	while(t <= 10 )
31	System.out.println(t);
32	t++;
33	int num1 = 1; int num2 = 7;
34	if( num1 < num2)
35	System.out.println(num1);
36	System.out.println(num2);
37	double MarathonInKM = (miles + yards / yardsDivisor) * kMConvertor;
38	final float kMConvertor = 1.609F;
39	final float yardsDivisor = 1760.0F;
40	float miles = 26.0F;
41	float yards = 385.0F;
42	double MarathonInKM = (miles + yards / 1760) * 1.609;
43	System.out.println(MarathonInKM);
44	else
45	while(t >= 10 )
46	if( num1 > num2)
47	int p = 100F;
48	float final kMConvertor = 1.609.0;
49	float final yardsDivisor = 1760.0;
50	System.out.println("MarathonInKM");

- 15) A marathon is a long-distance foot race with an official distance of 42.18596875 kilometers (or 26 miles 385 yards, or exactly  $26 \frac{7}{32}$  miles). Write a Java program to convert the distance of a marathon in miles and yards to kilo meters and output the kilo meter value. Miles can be converted to kilo meters by multiplying it with 1.609. Yards can be converted to miles by dividing it with 1760. Miles and yards can be assigned to variables with the names miles and yards respectively.

The **blank** space in the following Java program is to be filled.

```
public class MarathonConvertor{  
public static void main(String args[]){ blank } }
```

Which of the following list(s) of identified numbers from the given Java program segments could be selected for the blank space?

- |                       |                       |
|-----------------------|-----------------------|
| (a) 40,41,42,43       | (b) 2,3,4,5,6,43      |
| (c) 38,39,40,41,42,43 | (d) 38,39,40,41,37,43 |
| (e) 3,4,40,41,33,43   |                       |

- 16) Write a Java program to calculate the area of a circle. The formula for calculating area of a circle is  $= \pi \cdot \text{radius of the circle}^2$  (or  $PI * r^2$ ) assuming the *PI* value as 3.14. Consider that the *radius* as 5.

The **blank** space in the following program is to be filled.

```
public class AreaOfACircle{  
public static void main(String args[]){ blank } }
```

Which of the following list(s) of identified numbers from the given Java program segments could be selected for the blank space?

- |                  |               |
|------------------|---------------|
| (a) 8,9,10,18    | (b) 8,9,10,11 |
| (c) 3,4,5,6,7,11 | (d) 8,12,9,10 |
| (e) 43,42,41,40  |               |

- 17) Write a Java program to calculate the simple interest. The simple interest calculation formula is  $I = P * r * t$ . (I = interest, P = Principle value, r = rate and t represents time). For example, if one invest Rs.100 (the Principal) at a 5% annual rate for 1 year then the simple interest calculation is:  $Rs.5 = Rs.100 \times 5 \% \times 1 \text{ yr}$ . One has to use the same values and variable in the program.

The **blank** space in the following program is to be filled.

```
public class SimpleInterest {  
public static void main(String args[]){ blank } }
```

Which of the following list(s) of identified numbers from the given Java program segments could be selected for the blank space?

- |                       |                    |
|-----------------------|--------------------|
| (a) 13,14,15,16,17,18 | (b) 13,14,15,16,17 |
| (c) 13,14,16,17,18    | (d) 13,14,15,16    |
| (e) 13,14,15,17,18    |                    |

- 18) Write a Java program print number series from 1 to 10 in the console using *while* loop. One has to initialize the control variable with the name *t* equals to 1.

The **blank** space in the following program is to be filled.

```
class Ex18{  
public static void main(String args[]){ blank } }
```

Which of the following list(s) of identified numbers from the given Java program segments could be selected for the blank space?

- |                     |                        |
|---------------------|------------------------|
| (a) 16,30,1,31      | (b) 16,30,31,32        |
| (c) 16,30,1,31,32,2 | (d) 16,30,1,31,32,2,10 |
| (e) 16,1,31,32,2    |                        |

- 19) Write a Java program using *switch* statement to determine which season a particular month is in if the month is given as a number (1 for January, 2 for February etc.).

Months 12,1,2 → Season =Winter

Months 3,4,5 → Season =Spring

Months 6,7,8 → Season =Summer

Months 9,10,11 → Season =Autumn

Otherwise → Bogus month

In the program there should be a variable having the name *month* with the value 2.

The **blank** space in the following program is to be filled.

```
class Ex19{  
public static void main(String args[]){ blank } }
```

Which of the following list(s) of identified numbers from the given Java program segments could be selected for the blank space?

- |   |
|---|
| (a) 19,25,1,20,24,26,24,21,24,27,24,22,24                     |
| (b) 13,14,15,17,18,19   |
| (c) 19,25,1,20,24,26,24,21,24,27,24,22,24,28,24,23,24,29,24,2 |
| (d) 19,25,1,20,26,24,21,27,24,22,28,24,23,29,24,2             |
| (e) 13,14,15,17,18,20   |

- 20) Write a Java program to find the smallest number out of given two numbers. Numbers should be whole numbers with names *num1* and *num2*. Variable should be filled with literals 1 and 7. Using *if* statement one has to write the program.

The **blank** space in the following program is to be filled.

```
class Ex20{  
public static void main(String args[]){ blank } }
```

Which of the following list(s) of identified numbers from the given Java program segments could be selected for the blank space?

- |                            |                       |
|----------------------------|-----------------------|
| (a) 33,34,23,35,44,36,3,4  | (b) 33,34,35,44,36    |
| (c) 33,34,1,35,2,44,1,36,2 | (d) 33,34,23,35,44,36 |
| (e) 23,35,44,36,3,4        |                       |

**Consider the following paragraph to answer questions 21 – 22.**

“In the early days of programming, the main preoccupation was with the correctness of the solution. Precisely how that solution was derived was very much subordinate to the actual solution itself”

- 21) Select from among the following, the era which has been described by the given paragraph.

- |                                |                                 |
|--------------------------------|---------------------------------|
| (a) Programming as an art form | (b) Modular programming         |
| (c) Structures Programming     | (d) Object oriented Programming |
| (e) Java programming           |                                 |

- 22) Select from among the following, the design tool(s) which was/were emerged during this period.

- |                                      |                               |
|--------------------------------------|-------------------------------|
| (a) Flow charts                      | (b) if– then – else construct |
| (c) Nassi – shneiderman (NS) diagram | (d) Decision trees            |
| (e) Pseudo code                      |                               |

- 23) Select from among the following, which can be considered as guiding principles for the decomposition of a program into sub-procedures.

- |   |                                     |
|---|-------------------------------------|
| (a) Understandability                   | (b) Clear identification of tasks   |
| (c) Possibility of parallel development | (d) Eliminate duplication of coding |
| (e) Code reusability                    |                                     |

- 24) Select from among the following, correct statement on Java programming language.

- |   |
|---|
| (a) Java is a fully object oriented programming language.             |
| (b) Java supports multiple inheritance.                               |
| (c) Memory management in Java is automatic.                           |
| (d) Usage of pointers is allowed in Java.                             |
| (e) Error handling in Java is inbuilt to the programming environment. |

- 25) Select from among the following, the valid class/es which is/are bundled with java.lang package in Java.

- |            |                 |            |
|------------|-----------------|------------|
| (a) Math   | (b) String      | (c) System |
| (d) Applet | (e) IOException |            |

- 26) Consider the following output which has been generated when a program was executed.

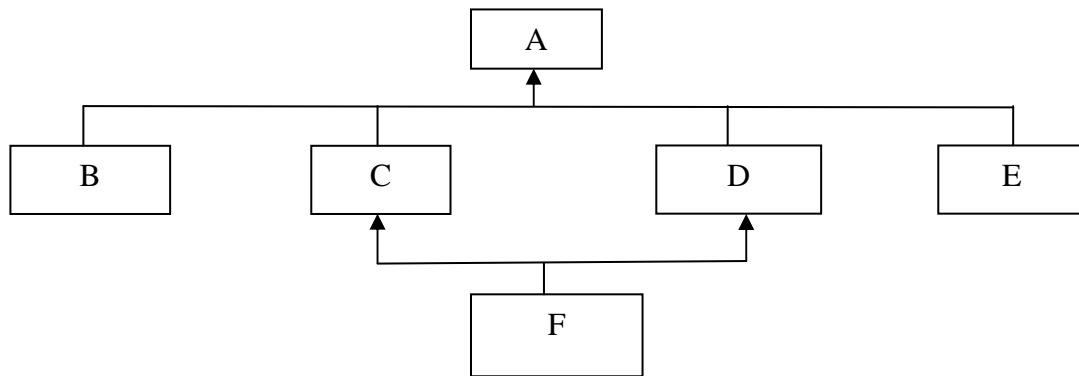
`java.lang.ArrayIndexOutOfBoundsException: 3`

Select from among the following, possible option(s), which can be (a) candidate(s) to generate such an output.

- |  |
|--|
| (a) <code>int a[] = new int[2]; System.out.println(a[3]);</code>               |
| (b) <code>file = new FileInputStream(fileName); x = (byte) file.read();</code> |
| (c) <code>int a[] = new int[2]; System.out.println(a[0]);</code>               |
| (d) <code>int a[] = {2,3}; System.out.println(a[3]);</code>                    |
| (e) <code>int a[] = new int[2]; System.out.println(a[2]);</code>               |



Consider the following diagram to answer questions 26 – 35 noting identifiers given for each box. Assume that the diagram illustrates a hierarchy of classes and their relationships.



- 27) Select from among the following, generic names in general, which can be given to identify the class having the identifier A.

(a) Super class	(b) Base class	(c) Parent class
(d) Child class	(e) Derived class	

- 28) Select from among the following, generic names which can be given to identify the class having the identifier C when consider the relationship with the class A.

(a) Child class	(b) Derived class	(c) Super class
(d) Parent class	(e) Base class	

- 29) Select from among the following, legal class declaration(s) which can be expected.

(a) class A extends B	(b) class B extends A	(c) class C extends A
(d) class D extends A	(e) class A extends C	

- 30) Select from among the following, valid relationship(s) in Java that are shown in the diagram.

(a) between A and B	(b) between A and C	(c) among A, C and D
(d) between A and E	(e) among C, D and F	

- 31) When consider the features of object orientation, which feature(s) is/are shown clearly in the diagram?

(a) Inheritance	(b) Method Overloading	(c) Method Overriding
(d) Data abstraction	(e) Multithreading	

- 32) Select from among the following, suitable example(s) which can be given for class A.

(a) Employee	(b) Doctor	(c) CommissionEmployee
(d) Chamara Madushanka	(e) Vehicle	

- 33) Select from among the following, suitable example(s) which can be given for class B.

(a) Lorry	(b) Book	(c) ReferenceCopy
(d) Vehicle	(e) Hospital	

- 34) Consider that the class A has been applied with the modifier *abstract* in a class declaration. Select from among the following, option(s) which are **not** allowed.

(a) A(){}	(b) abstract void show();
(c) class B extends A	(d) A obj1 = new A();
(e) obj1.show();	

- 35) Consider that the class C has been applied with the modifier *final* in a class declaration. Select from among the following, option(s) which are **not** allowed.

(a) C(){}	(b) abstract void update();
(c) class F extends C	(d) C obj2 = new C();
(e) private int var1;	

- 36) Consider the following method signatures written in the class B.

B ()  
B(int a, int b)

Select from among the following, object orientation feature(s) used in the above class.

(a) Inheritance	(b) method Overloading	(c) Function Overriding
(d) Data abstraction	(e) Multithreading	

- 37) Select from among the following, the common name which can be given for method overloading and method overriding as a whole.

(a) Polymorphism	(b) Abstraction	(c) Information hiding
(d) Encapsulation	(e) swings	

- 38) Select from among the following, the keywords which can be used implement in Java the object orientation feature called information hiding.

(a) public	(b) main	(c) private
(d) new	(e) protected	

- 39) Consider the following table with some random values. One needs to keep those values in a computer to process them.

2	5	6
6	17	2

Select from among the following, valid way(s) of keeping data in a computer by using Java.

(a) int a =2,b=5,c=6,d = 6, e = 17, f = 2;
(b) int ar = { 3,5,6},{6,17,2};
(c) int ar []= { 3,5,6},{6,17,2};
(d) int ar[][] = {{ 3,5,6},{6,17,2}};
(e) int[][] ar = {{ 3,5,6},{6,17,2}};

- 40) Consider the following skeleton of program noting the blanks indicated as **BLANK1**, **BLANK2** and **BLANK3**.

```
try
{
    BLANK1
} catch(BLANK2)
{
    BLANK3
}
```

Then consider the following candidate phrases which can be used to fill those blanks.

- I protected code
- II Exception object
- III Catch block
- IV Stream buffer

Select from among the following, (a) valid option(s) which can be consider for filling the blanks.

- |   |
|---|
| (a) BLANK1 → I, BLANK2 → II, BLANK3 → III |
| (b) BLANK1 → II, BLANK2 → III, BLANK3 → I |
| (c) BLANK1 → IV, BLANK2 → II, BLANK3 → I  |
| (d) BLANK1 → I, BLANK2 → III, BLANK3 → II |
| (e) BLANK1 → II, BLANK2 → IV, BLANK3 → I  |

- 41) Select from among the following, valid classes which comes with java.util package supporting set collection.

- |                |                      |                |
|----------------|----------------------|----------------|
| (a) HashSet<T> | (b) LinkedHashSet<T> | (c) TreeSet<T> |
| (d) Stack<T>   | (e) Vector<T>        |                |

- 42) Consider the following segment of program written in Java.

```
int ar1[]={1,2,3,4,5}; int ar2[]=new int[5];
for(int i = 0,j = 4;i < 5 & j>=0;i++,j--)
    ar2[i] = ar1[i]+ar1[j];
for(int i = 0; i < 5 ;i++ )
    System.out.print( ar2[i] );
```

What would the output be, if it is executed as a program?

- |           |           |            |
|-----------|-----------|------------|
| (a) 12345 | (b) 54321 | (c) 246810 |
| (d) 66666 | (e) error |            |

- 43) Select from among the following, standard streams that are accessible through members of System class in Java.

- |                    |                     |                    |
|--------------------|---------------------|--------------------|
| (a) standard input | (b) standard output | (c) standard error |
| (d) Exception      | (e) BufferedReader  |                    |

44) Read the following statement which explains one of the subclasses of FilterInputStream class.

“Read data from an encrypted input stream.”

Select from among the following, the sub class which matches with the above description.

- |                       |                       |                     |
|-----------------------|-----------------------|---------------------|
| (a) AudioInputStream  | (b) DigestInputStream | (c) DateInputStream |
| (d) CipherInputStream | (e) PipedInputStream  |                     |

45) Consider the following segment of program written in Java.

```
String firstString = "Chamara";  
String secondString = " madushanka";  
System.out.println(firstString += secondString);
```

What would the output of the program be?

- |                        |           |                |
|------------------------|-----------|----------------|
| (a) Chamara madushanka | (b) +=    | (c) madushanka |
| (d) Chamara            | (e) error |                |

\*\*\*\*\*