



**UNIVERSITY OF COLOMBO, SRI LANKA**

**UNIVERSITY OF COLOMBO SCHOOL OF COMPUTING**

**DEGREE OF BACHELOR OF INFORMATION TECHNOLOGY**

*Academic Year 2018 – 1<sup>st</sup> Year Examination – Semester 2*

***IT2205 - Programming I***

***22<sup>nd</sup> September, 2018***

***(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 **13 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.**
- Calculators are **not** allowed.

1) Which of the following are keywords in Java?

- |            |            |          |
|------------|------------|----------|
| (a) public | (b) static | (c) void |
| (d) int    | (e) try    |          |

2) Consider the following expression in the Java programming language.

**BLANK** number = 5;

Select valid option(s) to replace the term **BLANK** in this statement, from among the following.

- |          |           |         |
|----------|-----------|---------|
| (a) byte | (b) short | (c) int |
| (d) long | (e) float |         |

3) Consider the following code written in Java.

```
public class Ex3{  
    public static void main(String args[]){  
        int value;  
        System.out.print(value);  
    }  
}
```

What would the output of this code be?

- |       |           |                                    |
|-------|-----------|------------------------------------|
| (a) 0 | (b) value | (c) hex value of a memory location |
| (d) 7 | (e) error |                                    |

4) Consider the following code written in Java.

```
public class Ex3{  
    public static void main(String args[]){  
        final int value;  
        value = 7;  
  
        System.out.print(value);  
    }  
}
```

What would the output of this code be?

- |       |           |       |
|-------|-----------|-------|
| (a) 0 | (b) value | (c) 6 |
| (d) 7 | (e) error |       |

- 5) Consider the following code written in Java.

```
public class Ex3{
public static void main(String args[]){
final int value;
value = 7;
System.out.print(value);
value = 7;
System.out.print(value);
}
}
```

What would the output of this code be?

- |        |           |       |
|--------|-----------|-------|
| (a) 0  | (b) value | (c) 6 |
| (d) 77 | (e) error |       |

- 6) Select from among the following, those which can be considered as comments allowed in Java.

- |                    |                |                   |
|--------------------|----------------|-------------------|
| (a) //comment      | (b) \\ comment | (c) /* comment */ |
| (d) /**comment *\\ | (e) #          |                   |

- 7) Select from among the following, correct option(s) which illustrates escape sequence(s) allowed in Java.

- |        |        |        |
|--------|--------|--------|
| (a) \' | (b) \" | (c) \t |
| (d) \n | (e) \b |        |

- 8) Select from among the following, the default character encoding used in Java programming language.

- |            |             |                 |
|------------|-------------|-----------------|
| (a) ASCII  | (b) UNICODE | (c) ISO-LATIN-1 |
| (d) EBCDIC | (e) char    |                 |

- 9) Consider the following code written in Java.

```
enum Colour
{
    RED, GREEN, BLUE;
}

public class Ex9{
    public static void main(String[] args){
        Colour c1=Colour.RED;
        System.out.println(c1);
    }
}
```

What would the output of this code be?

- |       |           |         |
|-------|-----------|---------|
| (a) 0 | (b) 1     | (c) RED |
| (d) 3 | (e) error |         |

- 10) Consider the following code written in Java.

```
public class Ex10 {  
    public static void main(String[] args) {  
        char a = '\\';  
        System.out.println("C:"+a+"TC"+a+"BIN");  
    }  
}
```

What would the output of this code be?

- |                         |               |                 |
|-------------------------|---------------|-----------------|
| (a) C:\TC\BIN           | (b) C:aTCaBIN | (c) C:\\TC\\BIN |
| (d) "C:"+a+"TC"+a+"BIN" | (e) error     |                 |

- 11) Consider the following code written in Java.

```
class Ex11 {  
    public static void main(String args[]){  
        double a,b,c;  
        a = 3.0/0;  
        b = 0/4.0;  
        c = 0/0.0;  
        System.out.println(a);  
        System.out.println(b);  
        System.out.println(c);  
    }  
}
```

What would the output of this code be?

- |                      |                 |             |
|----------------------|-----------------|-------------|
| (a) infinity,0.0,NaN | (b) 0.0,0.0,0.0 | (c) NaN,3,4 |
| (d) 7,7,7            | (e) 3,4,0       |             |

**Use the following declarations and initializations to evaluate the Java expressions given in questions 12 - 17. Assume that each expression is evaluated separately in the program.**

```
int a=-1,b=2;  
float x=10.0f;  
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 evaluations 12 – 17.**

- 12) `System.out.println(a<<<1);`

- |         |           |         |
|---------|-----------|---------|
| (a) -1  | (b) 1     | (c) 001 |
| (d) 100 | (e) error |         |

- 13) `System.out.println(b>>>1);`

- |        |           |       |
|--------|-----------|-------|
| (a) 1  | (b) 2     | (c) 3 |
| (d) 01 | (e) error |       |

- 14) `System.out.println(x>>1);`

- |           |           |       |
|-----------|-----------|-------|
| (a) false | (b) true  | (c) 1 |
| (d) 01    | (e) error |       |

15) `System.out.println(x<<1);`

- |           |           |        |
|-----------|-----------|--------|
| (a) false | (b) true  | (c) 01 |
| (d) 1     | (e) error |        |

16) `System.out.println(ch<<1);`

- |           |           |         |
|-----------|-----------|---------|
| (a) false | (b) true  | (c) 130 |
| (d) 67    | (e) error |         |

17) `System.out.println(ch>>1);`

- |         |           |        |
|---------|-----------|--------|
| (a) 130 | (b) 32    | (c) 66 |
| (d) 67  | (e) error |        |

Consider the following table having two columns in it. First column has line numbers and the second has different programming statements and expressions. Using this table answer questions 18 – 22. Each question gives an expected output to be obtained. It also gives the class declarations and its main method. You are required to select from this table the relevant statement number(s) required to obtain the expected output.

No.	Supportive components for program writing
1	{
2	}
3	<code>for(int j=0;j&lt;=6;j++)</code>
4	<code>System.out.println("* ");</code>
5	<code>System.out.print("* ");</code>
6	<code>for(int j=1;j&lt;=6;j++)</code>
7	<code>for(int j=0;j&lt;=16;j++) ;</code>
8	<code>for(int j=1;j==6;j++)</code>
9	<code>for(int k=1;k&lt;=6;k++)</code>
10	<code>System.out.println();</code>
11	<code>for(int k=j;k&lt;=6;k++)</code>
12	<code>if(j==k)</code>
13	<code>else</code>
14	<code>System.out.print(" ");</code>
15	<code>System.out.print();</code>

18) Expected output:

```
*
*
*
*
*
*
*
```

Select from among the following, the correct option(s) to obtain the pattern shown above.

```
public class Ex18{
public static void main(String args[]){
    (a) 1,3,1,2,4,2          (b) 3,4          (c) 3,5
    (d) 8,4                  (e) 3,1,4,2
}
}
```

19) Expected output:

```
*****
```

Select from among the following, the correct option(s) to obtain the pattern shown above.

```
public class Ex19{
public static void main(String args[]){
    (a) 1,3,1,2,4,2          (b) 3,4          (c) 6,5
    (d) 8,4                  (e) 3,1,6,2
}
}
```

20) Expected output:

```
*****
*****
*****
*****
*****
*****
```

Select from among the following, the correct option(s) to obtain the pattern shown above.

```
public class Ex20{
public static void main(String args[]){
    (a) 6,1,9,5,10,2        (b) 3,1,5,2,11        (c) 7,1,8,9,2,10
    (d) 7,1,8,8,2,10        (e) 6,1,9,10,5,2
}
}
```

21) After seeing the pattern shown in question number 20), the software engineer changed the coding of the program to obtain the following pattern.

```
*****
*****
*****
****
***
**
*
```

Select from among the following, the correct option(s) to obtain the pattern shown above.

```

public class Ex21{
public static void main(String args[]){

```

- |                   |                  |                  |
|-------------------|------------------|------------------|
| (a) 6,1,11,5,10,2 | (b) 3,1,4,2,9    | (c) 7,1,8,9,2,11 |
| (d) 7,2,8,8,2,10  | (e) 6,1,9,10,5,2 |                  |

```

}
}

```

- 22) After seeing the pattern shown in the question number 20), the software engineer changed the coding of the program to obtain the following pattern.

```

*
 *
  *
   *
    *
     *

```

Select from among the following, the correct option(s) to obtain the pattern shown above.

```

public class Ex22{
public static void main(String args[]){

```

- |                           |                          |                           |
|---------------------------|--------------------------|---------------------------|
| (a) 6,1,9,12,5,13,14,10,2 | (b) 3,1,4,2,9,13,14,10,2 | (c) 7,1,8,9,2,11,14,12,15 |
| (d) 7,2,8,8,2,10,2        | (e) 6,1,9,10,5,2,14      |                           |

```

}
}

```

- 23) In Java programming, an array is represented as:

- |                         |                        |                 |
|-------------------------|------------------------|-----------------|
| (a) an object           | (b) a key word         | (c) an operator |
| (d) a character literal | (e) an escape sequence |                 |

- 24) Consider the following program written in Java.

```

class Ex24 {
    public static void main(String args[]){
        int ar[]=new int[2];
        System.out.println(ar[0]+ar[1]);
    }
}

```

What would the output of the program be?

- |       |           |       |
|-------|-----------|-------|
| (a) 5 | (b) 3     | (c) 1 |
| (d) 0 | (e) error |       |

- 25) Consider the following program written in Java.

```
class Ex25 {
    public static void main(String args[]){
        int arr[] = new int[] {0 , 1, 2, 3, 4, 5, 6, 7, 8, 9};
        int n = 6;
        n = arr[arr[n] / 2];
        System.out.println(arr[n] / 2);
    }
}
```

What would the output of the program be?

- |        |           |       |
|--------|-----------|-------|
| (a) 45 | (b) 3     | (c) 1 |
| (d) 0  | (e) error |       |

- 26) Consider the following program written in Java.

```
class Ex26 {
    public static void main(String args[]){
        int ar1[] = new int[] {0,1, 2, 3};
        System.out.println(ar1);
    }
}
```

What would the output of the program be?

- |                        |           |       |
|------------------------|-----------|-------|
| (a) 6                  | (b) 3     | (c) 1 |
| (d) Some garbage value | (e) error |       |

- 27) Consider the following program written in Java.

```
class Ex27 {
    public static void main(String args[]){
        int ar1[][] = {{ 1, 2, 3},
                       { 4 , 5, 6},
                       { 7, 8, 9}};
        int sum = 0;

        for (int i = 0; i < 3; ++i)
            for (int j = 0; j < 3 ; ++j)
                sum = sum + ar1[i][j];
        System.out.print(sum / 5);
    }
}
```

What would the output of the program be?

- |       |           |        |
|-------|-----------|--------|
| (a) 6 | (b) 7     | (c) 45 |
| (d) 9 | (e) error |        |



- 28) Select from among the following, the valid option(s) that can be used for naming classes, variables or methods in the Java programming language.

(a) keywords	(b) operators	(c) identifiers
(d) separators	(e) constants	

- 29) A process that involves recognizing and focusing on the important characteristics of a situation or object, as an object oriented feature is known as:

(a) Encapsulation	(b) Polymorphism	(c) Inheritance
(d) Abstraction	(e) Data hiding	

- 30) In object oriented programming new classes can be defined by extending existing classes. In object orientation, this is referred to as:

(a) Encapsulation	(b) Polymorphism	(c) Inheritance
(d) Abstraction	(e) Data hiding	

- 31) Select from among the following, correct object oriented feature which describes the process of wrapping up of data and functions into a single unit.

(a) Encapsulation	(b) Polymorphism	(c) Inheritance
(d) Abstraction	(e) Data hiding	

- 32) Select from among the following, the valid object oriented feature(s) which show(s) the ability of two or more objects belonging to different classes to respond to exactly the same method in different classes.

(a) Encapsulation	(b) Polymorphism	(c) Inheritance
(d) Abstraction	(e) Data hiding	

- 33) Consider the following program written in Java.

```
public class Ex33{  
  
    static int i = 1;  
  
    public static void main(String args[]){  
        System.out.print(i+" , ");  
        m();  
        m();  
        System.out.println(i);  
    }  
  
    public static void m(){  
        i += 2;  
    }  
}
```

What would the output of the program be?

(a) 1 , 1	(b) 1 , 3	(c) 1 , 4
(d) 1 , 5	(e) error	

34) Consider the following program written in Java.

```
public class Ex34{

    static int i = 1;

    public static void main(String args[]){
        System.out.print(i+" , ");
        m(i);
        m(i);
        System.out.println(i);
    }

    public static void m(int i)
    {
        i += 2;
    }

}
```

What would the output of the program be?

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

35) Consider the following program written in Java.

```
class Test{
    void method(int i, int j){
        i *= 2;
        j /= 2;
    }
}

class Ex35{
    public static void main(String args[]){
        Test ob = new Test();
        int a = 15, b = 20;
        System.out.println(a + " " + b);
        ob.method(a,b);
        System.out.println(a + " " + b);
    }
}
```

What would the argument passing method be which is used by the above program?

- |                   |               |                       |
|-------------------|---------------|-----------------------|
| (a) Call by value | (b) parameter | (c) Call by reference |
| (d) println()     | (e) method()  |                       |

36) Select from among the following, the valid option(s) to which the @Deprecated annotation can be applied.

- |                 |               |               |
|-----------------|---------------|---------------|
| (a) methods     | (b) variables | (c) operators |
| (d) identifiers | (e) arrays    |               |

37) Consider the following program written in Java.

```
class A{
protected int a;
A(){a=7;}
}

class B extends A{
private int b;
B(){b=3;}
public void show(){
System.out.println(a+" "+b);
}
}

public class Ex37 {
public static void main(String args[]) {
B obj=new B();
obj.show();
}
}
```

What would the output of the program be?

- |         |           |         |
|---------|-----------|---------|
| (a) 7 3 | (b) 10    | (c) 3 7 |
| (d) 4   | (e) error |         |

Consider the following program to answer questions 38 – 40.

```
interface Calculate{
    void cal(int item);
}

class Display blank1 Calculate{
    int x;
    public void cal(int item){
        x = item * item;
    }
}

class Ex40{
    public static void main(String args[]){
        Display arr = new Display();
        arr.x = 0;
        arr.cal(2);
        System.out.print(arr.x);
    }
}
```

38) Select from among the following, the valid option(s) to fill **blank1**.

- |               |              |                |
|---------------|--------------|----------------|
| (a) extends   | (b) extend   | (c) implements |
| (d) implement | (e) abstract |                |

- 39) Consider the following statement written in the above program.

```
void cal(int item);
```

Select from among the following, **invalid** alternative way(s) of implementing the above statement in an interface.

- |  |
|--|
| (a) private abstract void cal(int item);<br>(b) public abstract void cal(int item);<br>(c) private void abstract cal(int item);<br>(d) public void abstract cal(int item);<br>(e) private abstract void cal(); |
|--|

- 40) What would the output of the program be, if the software engineer has filled the **blank1** with the right option in a syntactically correct manner?

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

- 41) Consider the following program written in Java.

```
class Ex41{  
public static void main(String args[]){  
    String obj = "ILIKEJAVA";  
    System.out.println(obj.charAt(7));  
}  
}
```

What would the output of the program be?

- |       |           |       |
|-------|-----------|-------|
| (a) I | (b) L     | (c) V |
| (d) A | (e) error |       |

- 42) Consider the following program written in Java.

```
class Ex42{  
public static void main(String args[]){  
    String obj = "ILIKEJAVA";  
    System.out.println(obj.length());  
}  
}
```

What would the output of the program be?

- |       |           |        |
|-------|-----------|--------|
| (a) 9 | (b) 10    | (c) 11 |
| (d) 8 | (e) error |        |

- 43) Consider the following program written in Java.

```
class Ex4{
public static void main(String args[]){
    String s1 = "Hello";
    String s2 = s1.replace('l','w');
    System.out.println(s2);
    }
}
```

What would the output of the program be?

- |           |           |           |
|-----------|-----------|-----------|
| (a) ll    | (b) ww    | (c) Hello |
| (d) Hewwo | (e) error |           |

- 44) Select from among the following, valid interface(s) in the collection framework, which must contain unique elements in it.

- |             |                |          |
|-------------|----------------|----------|
| (a) Integer | (b) Set        | (c) List |
| (d) Array   | (e) Collection |          |

- 45) Select from among the following, the valid keyword(s) used for exception handling in Java.

- |            |             |           |
|------------|-------------|-----------|
| (a) try    | (b) catch   | (c) throw |
| (d) throws | (e) finally |           |

\*\*\*\*\*