

# King Saud University

College of Computer and Information Sciences  
Computer Science Department

|                     |   | <b>Course Code:</b>                  | CSC 111                        |
|---------------------|---|--------------------------------------|--------------------------------|
|                     |   | <b>Course Title:</b>                 | Introduction to Programming    |
|                     |   | <b>Semester:</b>                     | Fall 2017-2018                 |
|                     |   | <b>Exercises Cover Sheet:</b>        | <b>Midterm 1 Exam (FORM C)</b> |
|                     |   | <b><u>Duration: 90 min</u></b>       |                                |
| Student Name:       |   |                                      |                                |
| Student ID:         |   |                                      |                                |
| Student Section No. |   |                                      |                                |
|                     |   |                                      |                                |
| Tick the Relevant   | Computer Science B.Sc. Program ABET Student Outcomes  | Question No. Relevant Is Hyperlinked | Covering %                     |
| ✓                   | a) Apply knowledge of computing and mathematics appropriate to the discipline;  | 1,2,3                                | 50%                            |
|                     | b) Analyze a problem, and identify and define the computing requirements appropriate to its solution;   |                                      |                                |
|                     | c) Design, implement and evaluate a computer-based system, process, component, or program to meet desired needs;  |                                      |                                |
|                     | d) Function effectively on teams to accomplish a common goal;   |                                      |                                |
|                     | e) Understanding of professional, ethical, legal, security, and social issues and responsibilities;   |                                      |                                |
|                     | f) Communicate effectively with a range of audiences;   |                                      |                                |
|                     | g) Analyze the local and global impact of computing on individuals, organizations and society;  |                                      |                                |
|                     | h) Recognition of the need for, and an ability to engage in, continuing professional development;   |                                      |                                |
| ✓                   | i) Use current techniques, skills, and tools necessary for computing practices.   | 1,2,3                                | 50%                            |
|                     | j) Apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices; |                                      |                                |
|                     | k) Apply design and development principles in the construction of software systems of varying complexity;   |                                      |                                |

**Question 1. (6 Marks)**

Put your answers of the question 1 (multiple-choice questions) in the following table:

| Question | Answer |
|----------|--------|
| 1        |        |
| 2        |        |
| 3        |        |
| 4        |        |
| 5        |        |
| 6        |        |
| 7        |        |
| 8        |        |
| 9        |        |
| 10       |        |
| 11       |        |
| 12       |        |

1) What is the output of the following program (if any)?

```
public class Operators {
    public static void main(String args[]) {
        int i = 3, j = 5;
        int k = i++ + j;
        System.out.println(i + " " + j + " " + k);
    }
}
```

- a) Compilation Error
- b) 3 5 8
- c) 4 5 8
- d) 4 5 9

2) Which of the following expressions is equivalent to the Boolean expression

**!(varA < 5 && varB != varC)**

assume any value for varA, varB and varC

- a) None of the above
- b) varA > 5 || varB != varC
- c) varA >= 5 || varB == varC
- d) !(varA < 5) || (varB != varC)

3) What is the output of the following program (if any)?

```
public class Operators {
    public static void main(String args[]) {
        System.out.println(5 + 15 / 3 * 2 - 8 % 3);
    }
}
```

- a) Compilation Error
- b) 13
- c) 5
- d) 1

4) What is the output of the following program (if any)?

```
public class CompareToClass {
    public static void main(String args[]){
        String str1 = "Hello";
        String str2 = "Java";
        String str3 = "111CS";
        System.out.println(str1.equals("hello")+ " "+
        (str2.compareTo("java")<0)+" " + (str3.compareTo("CS111")>0));
    }
}
```

- a) Compilation Error
- b) false false false
- c) false true false
- d) true false true

5) Which of the following statements are equivalent?

|   |   |
|---|---|
| <p>(I)</p> <pre> if (i &gt; 0)   if(j &gt; 0)     x = 0;   else     if (k &gt; 0)       y = 0;     else       z = 0; </pre> | <p>(II)</p> <pre> if (i &gt; 0) {   if (j &gt; 0)     x = 0;   else if (k &gt; 0)     y = 0; } else   z = 0; </pre>                     |
| <p>(III)</p> <pre> if (i &gt; 0)   if (j &gt; 0)     x = 0;   else if (k &gt; 0)     y = 0;   else     z = 0; </pre>        | <p>(IV)</p> <pre> if (i &gt; 0)   if ((j &gt; 0) &amp;&amp; (i &gt; 0))     x = 0;   else if (k &gt; 0)     y = 0; else   z = 0; </pre> |

- a) They are no equivalent statements.
- b) (I), (II), and (IV) are equivalent.
- c) (I), (III), and (IV) are equivalent.
- d) (I), (II), and (III) are equivalent.

6) Are the following two statements equivalent?

|  |  |
|--|--|
| <p>(I)</p> <pre> if (income &lt;= 10000)   tax = income * 0.1; else if (income &lt;= 20000)   tax = 1000 +     (income - 10000) * 0.15; </pre> | <p>(II)</p> <pre> if (income &lt;= 10000)   tax = income * 0.1; else if (income &gt; 10000 &amp;&amp;   income &lt;= 20000)   tax = 1000 +     (income - 10000) * 0.15; </pre> |
|--|--|

- a) (II) has a compilation error.
- b) Yes.
- c) No.
- d) (I) has a compilation error.

7) Consider the following statement

```

if (score > 90)
  pay *= 1.03;
else
  pay = pay * 1.01;

```

- a) It has a compilation error.
- b) It increases **pay** by 1% if **score** is greater than 90, otherwise increases **pay** by 3%.
- c) It increases **pay** by 3% if **score** is less or equal than 90, otherwise increases **pay** by 1%.
- d) It increases **pay** by 3% if **score** is greater than 90, otherwise increases **pay** by 1%.

8) What is the output of the following segment (if any)?

```
int odd = 1;
if(odd) {
    System.out.println("odd");
}
else{
    System.out.println("even");
}
```

- a) Compilation error
- b) odd
- c) even
- d) It runs, but no output

9) What is the output of the following program (if any)?

```
public class Equals{
    public static void main(String [] args){
        int x = 100;
        double y = 100.1;
        boolean b = (x = y);
        System.out.println(b);
    }
}
```

- a) It runs, but no output
- b) true
- c) false
- d) Compilation fails

10) What is the output of the following segment (if any)?

```
int var1=1, var2=2, var3=3;
if(++var1 > var2++ || var1-- > 0)
    var3++;
else
    var3--;
System.out.println(var1+" "+var2+" "+var3);
```

- a) Compilation fails
- b) 2 3 2
- c) 1 3 4
- d) 2 2 4

11) What is the output of the following segment (if any)?

```
double d = 10.5;
int i = (int)d;
System.out.println(i+ " " + d);
```

- a) Compilation fails
- b) 10 10.5
- c) 10.5 10.5
- d) 10 10.0

12) After execution of the following code, what will be the value of **cnt**?

```
int cnt = 20;
if (cnt > 6)
    cnt = cnt + 5;
else if (cnt > 10)
    cnt = cnt + 15;
else cnt = 9;
System.out.println(cnt);
```

- a) 17
- b) 20
- c) 25
- d) 18

**Question 2. (2 Marks)**

Given two `int` variables, `x` and `y`, write the following Boolean expressions in Java:

a) an expression that returns `true` if `x` is divisible by 3.

b) an expression that returns `true` if  $|x - 5| < 4$ .

c) an expression that returns `true` if either `x` is greater than 50 or `y` is greater than 60, but not both.

d) an expression that returns `true` if `x` is even and `y` is odd

**Question 3. (2 Marks)**

Consider the following program:

```
import java.util.Scanner;
public class MyClass {
    public static void main(String [] args) {
        Scanner read = new Scanner (System.in);
        boolean a = read.nextBoolean();
        boolean b = read.nextBoolean();
        if( a ){
            if ( b )
                System.out.println("Output 1");
            }
        else if(a && b){
            System.out.println( "Output 2");
            }
        else{
            if ( !b ){
                System.out.println( "Output 3" ) ;
            }
            else{
                System.out.println( "Output 4" ) ;
            }
            System.out.println( "Output 5" ) ;
        }
        System.out.println( "END" ) ;
    }
}
```

Complete the following table:

| value of variable <b>a</b> | value of variable <b>b</b> | output (if any) |
|----------------------------|----------------------------|-----------------|
| true                       | true                       |                 |
| true                       | false                      |                 |
| false                      | true                       |                 |
| false                      | false                      |                 |



## Result

| Question No.   | Relevant Student Outcome | SO is Covered by % | Full Mark | Student Mark | Assessor's Feedback                                     |
|--|--------------------------|--------------------|-----------|--------------|---|
| 1  | a                        | 60                 | 6         |              |   |
| 2  | i                        | 20                 | 2         |              |   |
| 3  | a                        | 20                 | 2         |              |   |
|  |                          |                    |           |              |   |
|  |                          |                    |           |              |   |
| Totals   |                          | 100%               | 10        |              |   |
|  |                          |                    |           |              |   |
|  |                          |                    |           |              |   |
| I certify that the work contained within this assignment is all my own work and referenced where required. |                          |                    |           |              | Feedback Received:<br><br>Student Signature:      Date: |
| Student Signature:   |                          | Date:              |           |              |   |