

King Saud University

College of Computer and Information Sciences
Computer Science Department

| | | Course Code: | CSC 111 |
|---------------------|---|--------------------------------------|--------------------------------|
| | | Course Title: | Introduction to Programming |
| | | Semester: | Fall 2017-2018 |
| | | Exercises Cover Sheet: | Midterm 1 Exam (FORM B) |
| | | <u>Duration: 90 min</u> | |
| 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) varA > 5 || varB != varC
- b) varA >= 5 || varB == varC
- c) !(varA < 5) || (varB != varC)
- d) None of the above

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

5) Which of the following statements are equivalent?

| | |
|---|---|
| <p>(I)</p> <pre> if (i > 0) if(j > 0) x = 0; else if (k > 0) y = 0; else z = 0; </pre> | <p>(II)</p> <pre> if (i > 0) { if (j > 0) x = 0; else if (k > 0) y = 0; } else z = 0; </pre> |
| <p>(III)</p> <pre> if (i > 0) if (j > 0) x = 0; else if (k > 0) y = 0; else z = 0; </pre> | <p>(IV)</p> <pre> if (i > 0) if ((j > 0) && (i > 0)) x = 0; else if (k > 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 <= 10000) tax = income * 0.1; else if (income <= 20000) tax = 1000 + (income - 10000) * 0.15; </pre> | <p>(II)</p> <pre> if (income <= 10000) tax = income * 0.1; else if (income > 10000 && income <= 20000) tax = 1000 + (income - 10000) * 0.15; </pre> |
|--|--|

- a) Yes.
- b) No.
- c) (I) has a compilation error.
- d) (II) 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) odd
- b) even
- c) It runs, but no output
- d) Compilation error

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

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

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 a | value of variable 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. Student Signature: _____ Date: _____ | | | | | Feedback Received: Student Signature: _____ Date: _____ |