

King Fahd University of Petroleum and Minerals
College of Computer Science and Engineering
Information and Computer Science Department
Fall Semester (071)
ICS 102 - Introduction to Computing I

Major Exam 01

Name:

ID#:

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Question #	Maximum Marks	Obtained Marks
1	20	
2	40	
3	10	
4	15	
5	15	
Total	100	

~*Good Luck*~

Q1. [4 * 5 = 20 marks] Solve the following short answer questions:

- a) Convert the following mathematical expression to java code in the slot provided.

Mathematical expression

$$y = \left(x + \frac{5(x+1)}{10} + x + \frac{x}{4} + 5x \right) \bmod 7$$

The expression in java is:

y = _____ ;

- b) A student was asked to write a program which prints the string "ICS102" 5 times. He wrote the following program. If there are any mistakes in his program, fix them, otherwise Just write CORRECT beside it.

```
int k=1;
do {
    System.out.println("ICS102");
    k=k+1;
}while (k < 5);
```

- c) A student was asked to write a program which prints the string "ICS102" 5 times. He wrote the following program. If there are any mistakes in his program, fix them; otherwise leave his program as it is.

```
int k;
for(k = 0; k <= 5; )
    System.out.println ("ICS102");
    k++;
```

- d) Give the value assigned to the variables first, second and third.

```
boolean first  = 3 * 6 / 9 == 10 / 2 - 3;
boolean second = 8.0 / 2 - 2 > 2 / 2 + 1.0 ;
boolean third  = first && !second && true;
```

The values are:

first = _____
 second = _____
 third = _____

String Class Cheat Sheet

```
length()
compareTo(String)
compareToIgnoreCase(String)
equals(String)
equalsIgnoreCase(String)
toLowerCase()
toUpperCase()
```

Cont...

```
indexOf(String)
indexOf(String, int)
lastIndexOf(String)
charAt(int)
substring(int)
substring(int, int)
trim()
```

Math Class Cheat Sheet

```
PI , E
pow(double, double)
abs(double)
min(double, double)
max(double, double)
round(double)
sqrt(double)
```

Q2. [8 * 5 = 40 marks] Give output for each of the following code in the space provided:

Code	Output
<pre> public class MajorExam1Q2a { public static void main(String[] args) { int x = 3, y = x / 4; double z = x / 2; System.out.println(x + " " + y + " " + z); System.out.println(y / (double) x); System.out.println(2300 % 100 / x++ + ++y); System.out.println(15 % 4 * 5 - 15 / 2 * 5); System.out.println(x + " " + y + " " + z); } } </pre>	
<pre> public class MajorExam1Q2b { public static void main(String[] args) { String exam = "I mastered Java, it's fun!"; int n = exam.indexOf(" ", 8), a = 8, b = 7; System.out.println(exam.substring(n)); System.out.println(exam.lastIndexOf("Q")); exam = "" + exam.charAt(25) + a + b; System.out.println(exam); System.out.println("!".equals(exam)); } } </pre>	
<pre> public class MajorExam1Q2c { public static void main(String[] args) { int i, j; for(i = 0; i < 3; i++){ for(j = 0; j < 4; j++){ if(j%2 != 0) System.out.print("v"); else System.out.print("^"); } System.out.println(); } } } </pre>	
<pre> public class MajorExam1Q2d { public static void main(String[] args) { int numOfTimes = 0; while(numOfTimes > 2) System.out.print("H"); numOfTimes++; System.out.print("Help!"); System.out.print(numOfTimes); } } </pre>	

Code	Output
<pre> public class MajorExam1Q2e { public static void main(String[] args) { char grade = 'D'; switch (grade) { case 'A': System.out.println("Great!"); case 'B': System.out.println("V. Good"); case 'C': System.out.println("Good"); break; case 'D': System.out.println("Try Hard"); case 'F': System.out.println("Poor!"); default : System.out.println("Dropped!"); } } } </pre>	
<pre> public class MajorExam1Q2f { public static void main(String[] args) { int x = 10; if (x < 15) x = x + 10; if (x > 15) x = x + 5; if (x > 25) x = x + 1; System.out.println(x); } } </pre>	
<pre> public class MajorExam1Q2g { public static void main(String[] args) { int x = 10; if (x > 15){ System.out.println("Hi!"); } if (x > 1) System.out.println("Good day"); }else System.out.println("Welcome"); } } </pre>	
<pre> public class MajorExam1Q2h { public static void main(String[] args){ for (int y = 1; y < 10; y += 5) { System.out.println("Hi!"); for(int x = y; x >= 1; x -= 2) System.out.println("Major1"); System.out.println("Bye!"); } } } </pre>	

Q3. [10 marks] Write a program that does the following:

1. Reads two strings s1 and s2.
2. Check if s1 is inside s2 or not.
3. If s1 is inside s2 then print “inside”. Otherwise print “not inside”.

Hint: You can refer to the cheat sheet in page 2.

Example execution:

Enter s1: Saleh

Enter s2: Ahmad Saleh

The output is:

inside

Q4. [15 marks] Write a program that does the following:

1. Reads an integer number n .
2. Calculate sum given by the following formula:

$$sum = 1 + \frac{1}{2} - \frac{1}{3} + \frac{1}{4} - \frac{1}{5} \dots \pm \frac{1}{n}$$

3. Print sum.

Example execution:

Enter an odd integer: 3

sum = 1.6666...

Q5. [15 marks] Write a program that does the following:

1. Reads unknown number of integers with values between 0 and 20.
2. The loop should terminate if you enter a number outside the range (less than 0 or greater than 20).
3. Calculate their product.
4. Find the maximum value.
5. Print the product and the maximum.

Example execution:

Enter an integer:

5

Enter an integer:

7

Enter an integer:

25

The product = 35

The maximum = 7
