

**Information and Computer Science Department**  
**Term 192**  
**ICS 102 – Introduction to Computing I**  
**Major Exam 01**  
**Thursday, February 20, 2020 (07:30 PM - 09:00PM)**  
**Duration: 90 minutes**

**Name:**

**ID#:**

Please tick your section:

Instructor	Section
Dr. Ayman Hroub	<input type="checkbox"/> 01 UT (08:00 – 08:50)
Dr. Hamzah Luqman	<input type="checkbox"/> 02 UT (09:00 – 09:50)
Dr. Md Rafiul Hassan	<input type="checkbox"/> 03 UT (10:00 – 10:50) <input type="checkbox"/> 06 UT (11:00 – 11:50)
Dr. El-Sayed M. El-Alfy	<input type="checkbox"/> 04 UT (11:00 – 11:50) <input type="checkbox"/> 05 UT (13:00 – 13:50)
Dr. Husni Al-Muhtaseb	<input type="checkbox"/> 08 UT (09:00 – 09:50)

**Instructions:**

1. Answer all questions. Make sure your answers are clear and readable.
2. Make sure there are **6** questions in **6** pages.
3. The exam is closed book and closed notes. No calculators or any helping aides are allowed. Make sure to turn off your cell phone and keep it in your pocket.
4. If there is no space on the front of a question's page, use the back of the page. Indicate this clearly.

Question #	Max Mark	Obtained Mark	Remarks
1	20		
2	20		
3	12		
4	9		
5	15		
6	24		
<b>Total</b>	<b>100</b>		

**Question 1 (20 points):** Fill this table by selecting the most correct answer for each of the following 10 questions:

Question	1	2	3	4	5	6	7	8	9	10
Answer	B	D	E	D	A	B	A	C	D	B

1. Software that is embedded in ROM memory is called

- A. Firewall
- B. Firmware
- C. Application Software
- D. System Software

2. Which of the followings are valid identifiers in Java language?

- i. **ICS-102**
- ii. **java\_prog**
- iii. **2nd\_exam**
- iv. **new**
- v. **num^2**
- vi. **circle area**

- A. i, ii, iv, v
- B. i, ii,vi
- C. ii, iii
- D. ii
- E. ii,v,vi

3. Which of the followings are invalid identifiers in Java language?

- i. **name**
- ii. **Main**
- iii. **int**
- iv. **srt**
- v. **else**

- A. i, iii
- B. ii, iii, v
- C. iii only
- D. ii, v
- E. iii, v

4. **float speed = 86.0;**

The above statement has a Java compile time error, to fix this error, we can rewrite it as:

- A. **float speed= 86;**
- B. **float speed = 86.0f;**
- C. **float speed = (float) 86.0;**
- D. All of the above

5. A wrapper class in Java is used to
- A. convert primitive data types into objects and objects into primitive data types
  - B. convert between data types
  - C. type casting
  - D. storing numerical values in string variables
6. Program that translates and executes one instruction at a time is called
- A. Translator
  - B. Interpreter
  - C. Compiler
  - D. Assembler
7. One of the following data types is not allowed for the *switch* control variable
- A. **double**
  - B. **int**
  - C. **byte**
  - D. **char**
8. Applications written in Java language can run on any machine having java platform because:
- A. It is a high level programming language
  - B. It uses compiler only
  - C. A bytecode that is generated when java code is compiled
  - D. Java is an object oriented language
9. To import all classes in package `java.sql`, we should use the following statement:
- A. `import java;`
  - B. `import java.sql;`
  - C. `import java.sql.all;`
  - D. `import java.sql.*;`
10. A **final** variable is
- A. a variable that should be initialized during declaration
  - B. a variable that can be initialized only once
  - C. a variable that can be used only once
  - D. the last variable declared in the program

**Question 2 (20 points):** Evaluate the following Java expressions

Number	Expression	Value
1	<code>5 == 6</code>	false
2	<code>6 + 2*3/Math.sqrt(4)</code>	9.0
3	<code>9%(3+1)</code>	1
4	<code>5/(4+7) + 2 - 2*1</code>	0
5	<code>Math.ceil(9.5)/4</code>	2.5
6	<code>(int)6.6/3</code>	2
7	<code>1/2.0</code>	0.5
8	<code>(double)5/2</code>	2.5
9	<code>(5 + 3) * 5 + (8/2 + 1)</code>	45
10	<code>20 &gt; 15</code>	true

**Question 3 (12 points):** Write the expected output of each of the following code fragments.

**Note:** The output is what you see on the monitor when you run the code fragment ()

Code Fragment	Expected Output
<pre>int A=30; if(A &gt; 10) if(A%3==0) System.out.print("HOW "); else System.out.print("ARE "); System.out.print("YOU?");</pre>	HOW YOU?
<pre>System.out.println((int) (15/2.0)/2.0);</pre>	3.5
<pre>int y = 10, x; x = ++y*y++; System.out.printf("x = %d %n y = %d",x, y);</pre>	x = 121 y = 12
<pre>String str1 = "pen", str2 = "pEn"; int result = str1.compareTo(str2); if (result == 0) System.out.print("Same string"); else if (result &lt; 0) System.out.print("result &lt; 0"); else System.out.print("result &gt; 0");</pre>	result > 0
<pre>String s1 = "ICS 102"; String s2 = new String("ICS 102"); System.out.print(s1==s2);</pre>	False

**Question 4 (9 points):** Given the following Java code fragment, write the expected output for each of the following user's inputs

```
Scanner scanner = new Scanner(System.in);
age = scanner.nextInt();
firstName = scanner.next();
lastName = scanner.nextLine();

System.out.println(age);
System.out.println(firstName);
System.out.println(lastName);
```

User's Input	Expected Output
50 Ahmed Ibrahim\n	50 Ahmed Ibrahim
50\n Ahmed Ibrahim\n	50 Ahmed Ibrahim
50\n Ahmed\n Ibrahim\n	50 Ahmed

**Question 5 (15 points):** Identify the compile time errors in the following Java code fragments

Code Fragment	Compiler Error(s), if any
<pre>public static void main(String[] args) {     System.out.println(y); }</pre>	<ol style="list-style-type: none"> <li>Left curly brace is missing</li> <li>y is undefined</li> </ol>

<pre>public static void main(String[] args){     int x = 5, y = 8;     if(x &gt; y         x++;         y++     else         x--;</pre>	<p>3. The <i>if</i> left parenthesis is missing</p> <p>4. ; is missing after y++</p> <p>5. <i>else</i> without <i>if</i></p>
<pre>public static void main(String[] args){     Scanner import = Scanner(System.in); }</pre>	<p>6. <i>import</i> is a keyword and hence cannot be used as an identifier</p> <p>7. <i>new</i> operator is missing</p>
<pre>public static void MAIN(String[] args){     float a = 2.5;     System.out.printf("%f , a); }</pre>	<p>8. <i>main</i> method not found</p> <p>9. Type mismatch: cannot convert from double to float. It should be 2.5F or 2.5f</p> <p>10. String literal is not properly closed by a double-quote</p>

**Question 6 (24 points):** Write a Java program that converts temperature degrees from Fahrenheit to Celsius or vice versa. Your program prompts and reads the user's option.

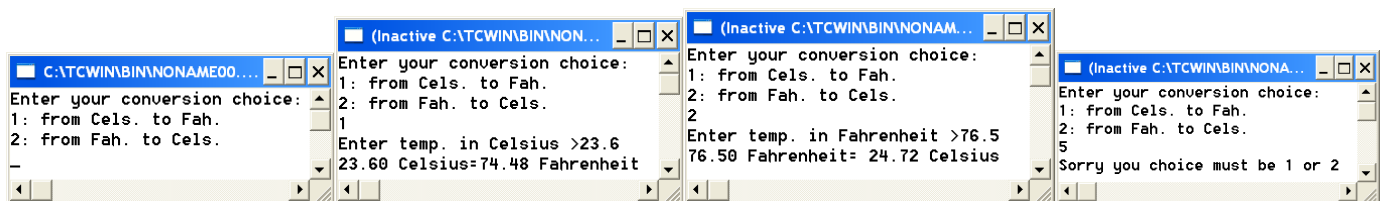
If the user types 1, then the program asks for a temperature in Celsius and converts it to Fahrenheit.

If the user types 2, then the program asks for a temperature in Fahrenheit and converts it to Celsius.

If the user types another number, the program displays an error message.

$$^{\circ}\text{C} = 5/9 * (^{\circ}\text{F} - 32) \quad \text{or} \quad ^{\circ}\text{F} = 9/5 * ^{\circ}\text{C} + 32$$

Your output must be identical to the one shown in the sample runs below.



**Solution:**

```
import java.util.Scanner;
public class Main
{
    public static void main(String[] args)
    {
        double cels, fah; int choice;
        System.out.println("Enter your conversion choice:");
        System.out.println ("1: from Cels. to Fah.");
        System.out.println ("2: from Fah. to Cels.");
        Scanner kb = new Scanner(System.in);
        choice = kb.nextInt();
        if(choice==1)
        {
            System.out.println("Enter temp. in Celsius >");
            cels = kb.nextDouble();
            fah=9.0/5*cels+32;
            System.out.printf("%.2f Celsius=%.2f Fahrenheit", cels, fah);
        }
        else if (choice==2) {
            System.out.println("Enter temp. in Fahrenheit >");
```

```
fah = kb.nextDouble();
cels=5.0/9*(fah-32);
    System.out.printf("%.2f Fahrenheit= %.2f Celsius",fah,cels);
}
else
    System.out.println("Sorry you choice must be 1 or 2");
}
}
```