

NAME: _____ RPI ID _____

CS1010 Introduction to Computer Programming Fall 2019 Exam 1

Please read the following pledge, then sign and print your name on the spaces provided, certifying the statement:

On my honor as a Rensselaer Polytechnic Institute student, I have abided by academic integrity standards on this exam, which means that I will not give or take answers from anyone.

Your Signature and Date

Your PRINTED name

Rules: There are **5 questions** in all to be completed in **1 hour 30 minutes**.

1. Work entirely alone. Do not give or solicit assistance from any other student. Academic dishonesty will not be tolerated.
2. Sit in your assigned seat.
3. Turn off cell phones and smart phones.
4. The exam allows use of hand written notes (1 page A4 size) for reference.
5. Feel free to use the restrooms as necessary. Just leave all your materials at your seat.
6. If you have a question, bring it down to the front so as to minimize disruption.

Question 1 _____

Question 2 _____

Question 3 _____

Question 4 _____

Question 5 _____

Total (From 100 points): _____

Question 1. (Variables and Arithmetic Expressions)

Assume you are paid \$25 per hour. On day 1 you work h1 hours and m1 minutes and on day 2 you work h2 hours and m2 minutes. Assuming that the variables h1, m1, h2, and m2 have already been assigned integer values, write code to calculate and print the total number of hours worked across the two days. Any partial hours (number of minutes more than zero but less than 60) count as 1 complete hour. Also print the total amount you are to be paid. **[20 points]**

For example, if you are given (DO NOT take USER INPUT for this problem):

h1 = 4, m1 = 45, h2 = 6, m2 = 16

then your output should be printed EXACTLY like this

Hours worked = 12

Total Pay = \$300

Solution:

Q2. (Functions)

a) Given two int values, return their sum by writing a function called `sum_double`. Unless the two values are the same, then return double their sum. **(10 points)**.

Test cases:

`sum_double(1, 2) → 3`

`sum_double(3, 2) → 5`

`sum_double(2, 2) → 8`

Solution:

b) Given 2 integer values and a parameter called negative (Boolean), write a function pos_neg that returns True if one number is negative and one is positive. Except if the parameter "negative" is True, then return True only if both are negative. **(20 points)**.

Test Cases:

pos_neg(1, -1, False) → True

pos_neg(-1, 1, False) → True

pos_neg(-4, -5, True) → True

Solution:

Q3. (Boolean) What will be the Boolean output of the following operations (**10 points: 2 points each**)

a. $7 \leq 0$

b. $(3+5) == 8$

c. $(\text{not}(x < 15 \text{ and } y \geq 3)) == (\text{not } x \geq 15) \text{ or } (\text{not } y < 3)$

d. If $x = 15$, $y = 20$, then what is the output of $x != y$

e. $5 != 5$

Q4. (Error) What is wrong with the following code. Assume each of the following is a separate program. Find the first error in the code that prevents it from generating output. If there is an error describe it in the solutions box on the right. If there is no error simply write NO ERROR.
(20 points: 4 points each)

Code	Solution
<pre>import math def f1(v,x,y,z): p=2v+x+y+z p=math.sqrt(p) return p print("square root is",f1(3,3,3,3))</pre>	
<pre>def diff_true(a, b): diff = a - b if diff >= 0: return True return False</pre>	
<pre>def isnotequal(a,b): return (a b)</pre>	
<pre>k = 20 if (k == 10): # First if statement if (k < 15): print ("k is is in first if statement") if (k < 12): print ("k is in the nested if") else: print ("k is in else block of nested if")</pre>	
<pre>x=12/11 y=13/7 print('The value of y is {0:.2f} and x is {1:.2f}'; format(y,x))</pre>	

Q5.

- a. **String Operation:** Given a string 'a', a = 'Welcome to New York!'

Write a single line of code to accomplish the following: **(10 points: 2 points each)**

Question	Solution/code
Print the string that says 'New York!'	
Print the string that returns 'WelcometoNewYork!'	
Find the number of letter 'e' occurrences in the string.	
Return the string a with all lowercase letters.	
Return the string a, such that all lower case 'o' are replaced by 0 (zero) to get: 'Welc0me t0 New Y0rk!'	

- b. What is the output of the following code. There is no syntax error here. **(10 points: 2 points each)**

Question	Output
<pre>def f(a): return a[::-1] f('google')</pre>	
<pre>def make_tags(tag, word): st1='<'+tag+'>' st2='<'+ '/' +tag+'>' return st1+word+st2 print(make_tags('address', 'here'))</pre>	
<pre>s='Rensselaer' s[1:5]</pre>	
<pre>s='Good Morning' s.find('o',3)</pre>	
<pre>x=85 y=x//10 z=x%10 print('The value of y is {}, and of z is {}'.format(y,z))</pre>	