

NAME:

**Closed book. No calculators, no computer.
Write all answers on these sheets. Do not ask questions!**

question	1	2	3	4	5	6	7	total
points								
maximum	10	15	15	15	20	15	10	100

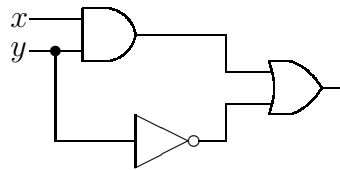
1. What is a register?

/10

2. View A4 as a number in the hexadecimal system. What is A4 in the decimal system?

/15

3. Consider the circuit drawn below:



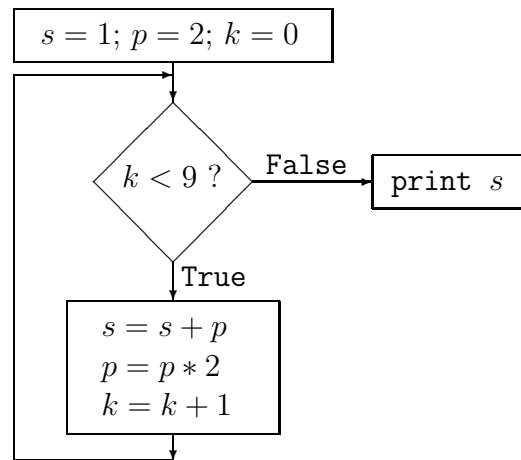
- (a) For $x = 1$ and $y = 0$, what is the outcome of this circuit?
Mark the results on the circuit drawing above.
- (b) What is the logical expression that represents this circuit?

/15

4. Given in n is a natural number which represents time in a 24 hour format.
Write Python code to print the corresponding time in AM/PM format.
Some examples: 845 = 845 AM, 2045 = 845 PM, and 1221 = 1221 PM.

/15

5. Consider the flowchart:



(a) What *expression* does the algorithm in the flowchart compute?
(Do NOT evaluate the expression into one number.)

(b) Write Python code to implement the algorithm.

6. The length of a vector with coordinates (v_1, v_2, v_3) is $\sqrt{v_1^2 + v_2^2 + v_3^2}$.

Write a Python *function* (call it `length`) which takes on input the coordinates of a vector and returns the length of the vector. Make sure the function works also for planar vectors, so the user can enter only two coordinates.

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7. Give the Python commands to generate a random 10-letter word.
Use `random.randint()` to uniformly generate letters.
The final result is a string of 10 characters.

/10
