

Name: \_\_\_\_\_

EECE.3170 Spring 2024  
Quiz 4

1. Consider the registers below.

R19: 1100 1011

R20: 1001 1010

a. What is contained in each register if the following code is run? (6 points)

push r20

push r19

pop r20

pop r19

R19: 1001 1010

R20: 1100 1011

b. What is contained in each register if the following code is run? (6 points)

push r20

push r19

pop r19

pop r20

R19: 1100 1011

R20: 1001 1010

Name: \_\_\_\_\_

2. Below is a snippet of AVR assembly code. For each line in the code, there is a box for the contents of r16 and r17. Fill in the current contents of those registers AFTER that line of code. So for the first line, fill in the contents of r16 and r17 AFTER the operation to the left is run. The lines of code are run sequentially from top to bottom. If the state of a register is unknown, state that. Use the reference information below to understand the operations. (18 points)

Operation	Contents of R16	Contents of R17
ldi r16,0b000000010	0000 0010	unknown
ldi r17,0b000110010	0000 0010	0011 0010
add r16,r17	0000 0010 <u>+0011 0010</u> 0011 0100	0011 0010
or r16,r17	0011 0100 <u>  0011 0010</u> 0011 0110	0011 0010
inc r17	0011 0110	0011 0011
eor r17,r16	0011 0110	0011 0011 <u>XOR 0011 0110</u> 0000 0101

Instruction guide:

- Load immediate - ldi Rd,K – load number K into register d. Numbers are assumed to be decimal unless preceded by 0b (binary) or 0x (hex).
- Add – add Rd,Rr – add registers r and d, store in register d.
- Logical or – or Rd,Rr – logical or registers r and d, store in register d.
- Exclusive or - eor Rd,Rr – exclusive or registers r and d, store in register d.
- Increment – inc Rd – add one to register d and store in register d.