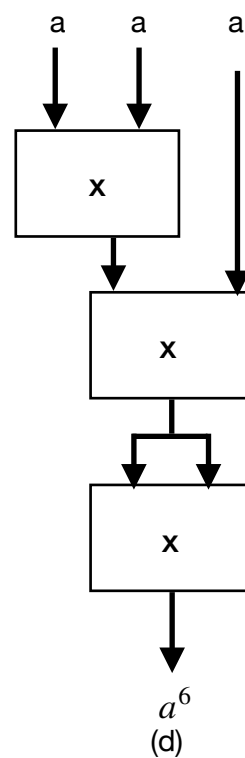
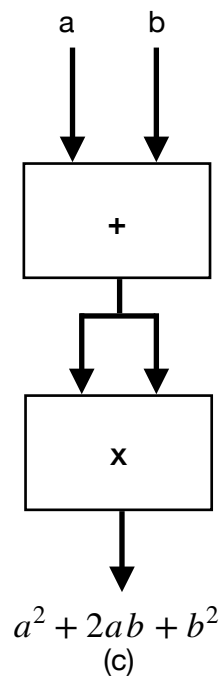
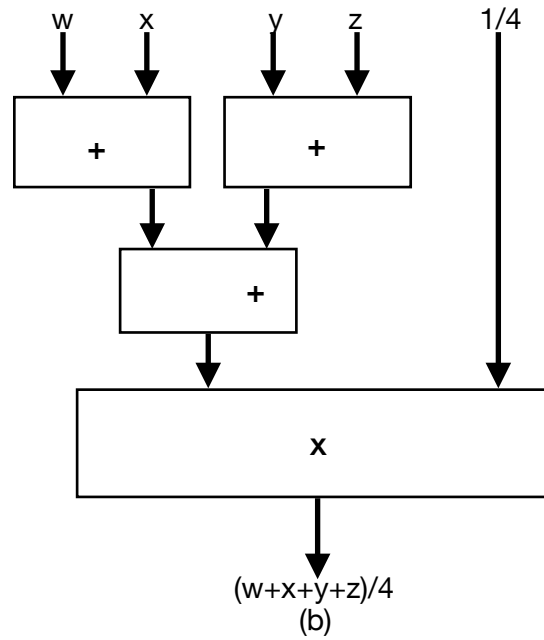
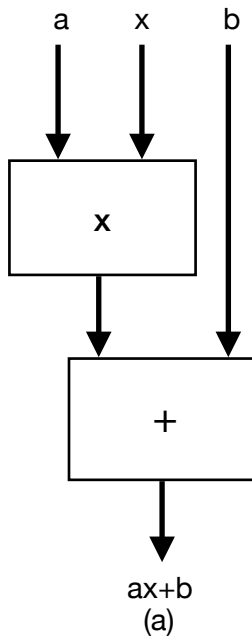


PLEASE TELL ME IF THE FORMAT IS WRONG OR LOOKS WIRED.

Q1:



Q2:

- a. There are 4 kinds of sorting methods, 5 kinds of programming language, 2 kinds of ISA, and 3 kinds of microarchitectures for each kind of ISA respectively. Therefore, $4 \times 5 \times 2 \times 3 = 120$ transformation processes are possible.
- b. "Bubble Sort, Pascal program, x86 ISA, Core microarchitecture"
"Shell Sort, C++ program, x86 ISA, Core microarchitecture"
"Quick Sort, Fortran, SPARC, microarchitecture for SPARC"
- c. $4 \times 5 \times (2+4) = 120$ transformation processes are possible, as each kind of ISA has to choose its own specific microarchitectures.

Q3:

- a. $2^8 < 400 < 2^9$, so the minimum number of bits required is 9.
- b. $2^9 - 400 = 512 - 400 = 112$ more students.

Q4:

- a. 00010110
- b. 11111101
- c. 11111000
- d. 00000001

Q5:

- a. $01 + 1011 = 1100 = -4$ (decimal)
- b. $11 + 0101\ 0101 = 01010100 = 84$ (decimal)
- c. $0101 + 110 = 0011 = 3$ (decimal)
- d. $01 + 10 = 11 = -1$ (decimal)

Q6:

- a. $01010101 = 85$
- b. $10001101 = -115$
- c. $10000000 = -128$
- d. $11111111 = -1$

Q7:

$$0.3 = 1.001\ 1001\ 100\dots * 2^{(-2)}$$

Removing the first 1, the fraction bits [22:15] is 0011 0011.

Q8:

1 10000010 101010011000000000000000

Exponent = 1000 0010 = 130

Fraction = 10101001100...

so $N = -1.101010011 \times 2^3 = -1101.010011 = -13.296875$

Q9:

- $xABCD \text{ OR } x9876 = xBBFF$
- $x1234 \text{ XOR } x1234 = x0000$
- $xFEED \text{ AND } (\text{NOT}(xBEEF)) = x4000$

Q10:

$Q1 = X \text{ and } (\dot{X} + \dot{Y} + \dot{Z}) = X(\dot{Y} + \dot{Z})$

$Q2 = \text{NOT}(X) + \text{NOT}(Y) + \text{NOT}(Z)$

X	Y	Z	Q1	Q2
0	0	0	0	1
0	0	1	1	1
0	1	0	0	1
0	1	1	1	1
1	0	0	0	1
1	0	1	1	1
1	1	0	1	1
1	1	1	0	1
1	1	1	1	0