HOMEWORK 04

1.) Create the ISO fluid logic for the following functions (assume that Z and Y are single-acting cylinders):

a.) $Z = (A + B) \cdot C$

b.) $Y = (A + C) \cdot (\overline{B} + D) \cdot \overline{E}$

2.) Create the wire/ladder logic for the following functions:

a.) $Z = (A + B) \cdot C$

b.) $Y = (A + C) \cdot (\overline{B} + D) \cdot \overline{E}$

c.) $X = \overline{(A \cdot B)} + C$

3.) Create the gate logic for the following functions:

a.) $Z = (A + B) \cdot C$

b.) $Y = (A + B) \cdot (\overline{C} + D) \cdot \overline{E}$

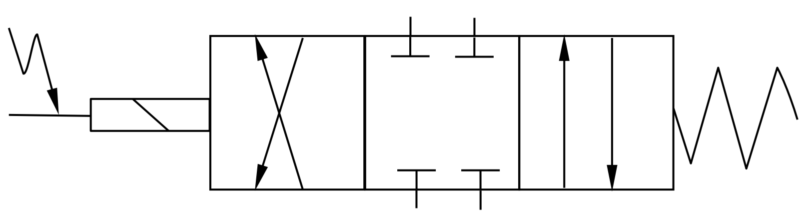
c.) $X = \overline{(A \cdot B)} + C$

4.) Demonstrate with truth tables whether or not:

a.) $(\overline{A} \cdot \overline{B}) = \overline{(A \cdot B)}$

b.) $(\overline{A} + \overline{B}) = \overline{(A \cdot B)}$

5.) Shown below is a fluid control valve. Answer the following:



a.) How many ports does the valve have?

b.) How many positions does the valve have?

c.) How is the valve actuated?

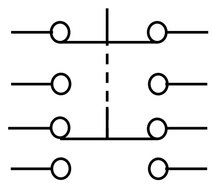
d.) What would the valve be named using ISO standards?

6.) Name the devices described/shown below:

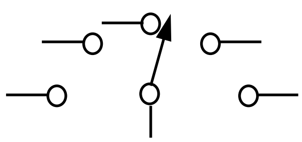
a.) A device that allows up to 25 A of current to flow to a heater when activated by a 1 A pilot signal.

b.) An electric device that completes two separate circuits at the same time, the device stays in position after actuation, and there are four position options for each of the completed circuits.

c.) The switch illustrated below:



d.) The switch illustrated below:



e.) The component of a shop pneumatic system that comes after the compressor.

7.) What mathematical relationship exists between the diameter of the main line and the branch diameters of three branch lines that connect to it?

8.) An NC router must move according to the following code: **G90 G01 X60 Y100**. If the current position is **X2 Y2**, and if the X axis can move at a rate of up to 12 units/second and the Y axis can move at a rate of up to 8 units/second, answer the following:

a.) How many seconds will the motion take to complete?

b.) What are the operating percentages for each axis motor?