The University of Jordan
School of Engineering
Electrical Engineering Department

EE 449
Instrumentation and Control Lab

EXPERIMENT 4 REPORT
ELECTROPNEUMATIC CONTROL SYSTEMS

Section # _____ Group # _____

	Student Name	ID
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EXPERIMENT 4
ELECTROPNEUMATIC CONTROL SYSTEMS

PROCEDURE 1 – Direct control of single-acting cylinder from two different locations

4. Connect the system and record your results in the following table:

x1	x2	OR gate output (expected)	a0	a1	Cylinder status
0	0				
0	1				
0	0				
1	0				
0	0				
1	1				
0	0				

5. Explain what happened when you reset control signals x1 = x2 = 0 after each step.

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6. Slow down the flow air speed manually by the related valve and repeat the previous step. What did you notice?

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PROCEDURE 2 – Indirect control of a double acting cylinder by a single pushbutton

4. Connect the system and record your results in the following table:

x	a0	a1	Cylinder status
1			
0			

5. Explain what happened.

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PROCEDURE 3 – Semiautomatic control of double acting cylinder by a limit switch without and with Timed return

3. Put the control signal (pushbutton inputs) (Primary Moving Switch (PMS)=1).

4. Explain what happened.

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6. Modify the previous control system as shown in fig (1.22). What do you expect the mode of this timer to be? (NC or NO).

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9. Put the control signal (pushbutton inputs) (PMS=1).

10. Explain how this system works.

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11. Modify the above timed return control system such that A+ and A- are repeated automatically indefinitely. (Hint: connect a0 and pushbutton to suitable logic gate). Explain how your system works.

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12. Draw the electronic diagram of your control system.

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PROCEDURE 4 – A control System of two double acting cylinders

5. Connect the system and record your results in the following table:

Phase #	a0	a1	A	b0	b1	B
1						
2						
3						
4						
5						
6						

6. How many times the phases will be repeated? Explain why.

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7. Turn the lever OFF. What will happen? Explain.

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8. What will change if you replace the lever valve with pushbutton valve?

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9. What is the effect of the initial value of a0 in this control design?

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PROCEDURE 5 – (5) Electronic control System

3. Connect the system and record your results in the following table:

A	B	U
0	0	
0	1	
1	0	
1	1	

4. State the equivalent logic function of this logical control system.

U =

5. What is the equivalent logic gate of this function?

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PROCEDURE 6 (I) – Electropneumatic control System, First example

5. What is the state of a1 when you start?

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6. Explain what happen to each part of the system at all phases.

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PROCEDURE 6 (II) – Electropneumatic control System, Second example

6. What is the initial value of a0, a1, b0 and b1?

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8. Explain what happen to each part of the system at all phases.

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10. Show the electronic diagram of the following functions.

$$\bar{A}\,B$$

$$\bar{B} + \bar{C}$$

**** End ****