

(3 Hours)

N.B.:

1. Question No.1 is compulsory.
2. Attempt any **three** questions out of remaining **five** questions.
3. Figures to right indicate full marks.
4. Assume suitable data if **necessary**.

- Q1 a. Name the three basic elements of automated systems. Explain same in detail. 8
- b. Differentiate between pneumatic and hydraulic systems. 6
- c. Write short note on end effectors used in robots. 6

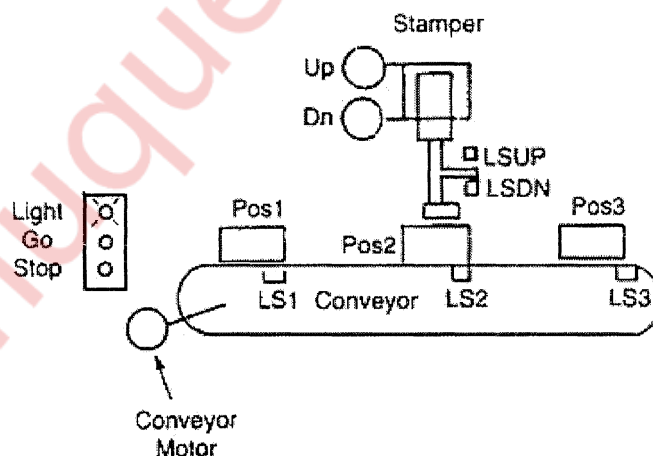
- Q2 a. Design simple pneumatic circuit for tow cylinder operation with following sequence using 4/2 pilot operated valve as DCV. 10
- A+ B+ Delay A- B-
- With user selection option single cycle & Multicycle operation. Draw displacement time diagram
- b. List the different sensors bases on low, medium and high pressure measurement. Explain any two in detail. 10

- Q3 a. 12

Design PLC Ladder diagram for following process details

Problem Description -

When a part is placed on the conveyor at position 1, and when a start button is pressed it moves to position 2. Upon reaching position 2, it stops for the stamping operation to take place. After stamping it automatically moves to position 3. It stops at position 3, where the part is removed manually from the part. Assume only one part is on the conveyor at a time. Add limit switches, interlocks, push buttons, etc. as required.



- b. Explain in detail two industrial applications of robots. 8

- Q4 a. Explain PLC architecture in detail. 7  
b. What are AGVs? Explain any two technologies used in AGVs 7  
c. Write short note on FRL Unit used in Pneumatics systems. 6
- Q5 a. 12  
Design electro pneumatic circuit for three cylinder operation with following sequence using 5/2 both side solenoid operated valve as DCV.  
(AB)+ Delay A- C+ C- B-  
With user selection option single cycle & Multicycle operation.  
b. Explain in detail reasons for automating a system. 8
- Q6 a. Write short note on Geneva mechanism. 7  
b. Explain criteria of selection of actuators in detail. 7  
c. Differentiate between Mechanization & automation 6

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