

NB

- 1) Question No. 1 is compulsory
- 2) Attempt any three questions out of the remaining five questions.
- 3) Figures to the right indicate full marks.
- 4) Assume suitable data wherever required but justify the same.

Q1. Attempt any four (20)

- A. Define degree of Freedom (DoF) for robot. Explain robot anatomy in detail.
- B. Explain Linear regression and its application in AI.
- C. Write short note on PLC Structure, Advantages and Disadvantages.
- D. Explain in detail Levels of Automation.
- E. Draw & Explain the electro pneumatic circuits for direct & Indirect control for Double active cylinder 5/2 DCV both solenoid operated.

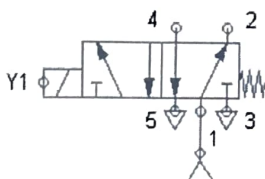
- Q2. A. Write detail note on Robot Configurations with respect to joints, applications, advantages & Disadvantages. (any two) (8)
 B. Write short note on Basic model of ANN. (6)
 C. Explain FRL unit used in Pneumatics. (6)

- Q3. A. Explain Breadth first search Algorithm in detail with example (10)
 B. Design electro Pneumatic circuit for two cylinder operation with following sequence using 5/2 both side solenoid operated valve as DCV. (10)
 (AB) + A - Delay B-
 With user selection option single cycle & Multicycle operation.

- Q4. A. Design simple hydraulic circuit for two cylinder operation with following sequence using 4/2 pilot operated valve as DCV using cascade method (12)
 A + B + Delay A - B-
 With user option of single cycle - multi cycle. Also draw displacement diagram.
 B. Compare Supervised, Unsupervised and reinforcement learning with different parameters. (08)

- Q5. A. Explain any two intelligent agents in detail. (08)
 B. Explain tree and graph search. (06)
 C. Explain selection criteria for Robot. (06)

- Q6. A. Differentiate between uninformed and informed search algorithms. (05)
 B. Write detail note on types of end effecters used in robotics. (05)
 C. Identify following valve specification & discuss in detail. (05)



- D. Write short note on timers and counters used in PLC Circuits. (05)

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