Paper / Subject Code: 89424 / Automation and Artifical Intelligence

1T01436 - T.E.(Mechanical) Engineering)(SEM-VI)(Choice Base Credit Grading System) ((R-20-21) (C Scheme) / 89424 - Automation and Artifical Intelligence

QP CODE: 10012190
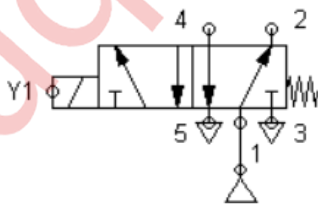
(3 hours)

DATE: 15/12/2022

Total Marks: 80

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 Liner 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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