Paper / Subject Code: 89424 / Automation and Artifical Intelligence

TE Sem VI (R 2019 C Scheme) "Mechanical" Dec 2023

8/12/2023

Total Marks: 80

(3 hours)

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. State the difference in flexible automation and fixed automation with application.
B. Explain Automation migration strategy.
C. Define degree of Freedom (DOF) for robot. Explain robot anatomy with sketch.
D. Write short note on PLC Architecture.
E. Explain Linear regression and its application in AI.

Q2 A. Design electro Pneumatic circuit for two cylinder operation with following sequence using 5/2 both side solenoid operated valve as DCV. (10)
A+ Delay B+ A-B-

B. Explain concept of Artificial Neural Networks (ANN) in detail. List and define Terminologies of ANNs. (10)

Q3 A. List Agents used in Artificial Intelligence. Explain any two in detail. (10)
B. Explain Breadth first search Algorithm in detail with example (05)
C. Write short note on Logistic regression. (05)

Q4 A. Compare Supervised, Unsupervised and reinforcement learning with different parameters. (10)
B. Design simple hydraulic circuit for two cylinder operation with following sequence using 4/2 pilot operated valve as DCV using cascade method (10)
A+ B+ A- Delay B-
With user option of single cycle – multi cycle. Also draw displacement diagram.

Q5 A. Explain depth first search algorithm with example. (08)
B. Write note on different actuation methods for Direction control valves (08)
C. Explain tree and graph search. (04)

Q6 A. State and explain K-Means Clustering algorithm in detail. (08)
B. Write detail note on Meter in and Meter out circuits used in Hydraulics operations. (08)
C. Explain role and applications of timers and counters in PLC. (04)

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