May 27, 2024 02:30 pm - 05:30 pm 1T01436 - T.E.(Mechanical) Engineering)(SEM-VI)
(Choice Base Credit Grading System) ((R- 19) (C Scheme) / 89424 - Automation and Artifical Intelligence QP CODE: 10055266

[Time: 3 hours] **[Total Marks: 80]**

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

Q1. **Attempt any four** (20)

A. Justify the use of Pneumatics and Hydraulics with suitable examples.
B. List four levels of automation with suitable examples.
C. Explain the components of a Robotic system with a neat sketch.
D. Explain the Architecture of PLC with a neat block diagram
E. State the meaning of an intelligent system and explain the components of an intelligent system

Q2 **A.** Design an electro-pneumatic circuit for two-cylinder operation with the following sequence using 5/2 both side solenoid operated valve as DCV. (10)
A+ B+ Delay A-B-
With user selection option single cycle Multicycle operation.
B. Differentiate between hydraulic meter-in and meter-out circuits with suitable applications. (10)

Q3 **A.** State the types of intelligent agents. Explain the goal-based agent along with a neat sketch. (10)
B. Illustrate with neat sketches the mechanical and vacuum type of end effectors used in robotic systems, stating their advantages and disadvantages. (10)

Q4 **A.** Compare Supervised, Unsupervised, and reinforcement learning with different parameters. (10)
B. Design a hydraulic circuit for two-cylinder operation with the following sequence using 4/2 pilot-operated valve as DCV using cascade method, A+ , B+ , Delay B- , A- (10)

Q5 **A.** State the use of a decision tree. Explain the terminology of the decision tree with a suitable example. (08)
B. Write note on different actuation methods for Direction control valves (08)
C. State the steps of the K-mean algorithm for clustering analysis (04)

Q6 **A.** What is the activation function? Explain the log-sigmoid activation function with a neat sketch. (08)
B. List any five applications of Natural Language Processing (NLP). (06)
C. What is the activation function? Explain the log-sigmoid activation function with a neat sketch (06)