Code No : 20EE7O03

R20

IV B. TECH I SEMESTER REGULAR EXAMINATIONS, NOVEMBER - 2023
NEURAL NETWORKS AND FUZZY LOGIC
(ELECTRICAL AND ELECTRONICS ENGINEERING)

Time: 3 hours Max. Marks: 70

Note : Answer **ONE** question from each unit **(5 × 14 = 70 Marks)**

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UNIT-I

1. a) Discuss the evolution of artificial neuron models, emphasizing the Hodgkin-Huxley Neuron Model. [7M]
   b) Explore the characteristics and applications of ANN. [7M]

(OR)

2. Elaborate on the concept of knowledge representation in the context of neural networks. [14M]

UNIT-II

3. a) Discuss the evolution of single-layer feedforward networks, highlighting their characteristics and applications. [7M]
   b) Compare single-layer with multi-layer networks, emphasizing their distinct features. [7M]

(OR)

4. a) Discuss the learning methods used in artificial neural networks. [7M]
   b) Explain the advantages and limitations of supervised, unsupervised, and reinforced learning. [7M]

UNIT-III

5. Investigate the concept of neural network recall, emphasizing the principles of recurrent networks with a focus on Hopfield networks. [14M]

(OR)

6. Explain the practical applications of artificial neural networks in Load Forecasting and Economic Load Dispatch along with the benefits and challenges. [14M]

UNIT-IV

7. a) Let R and S are the crisp relations defined on the sets {1,3,5} X {1,3,5}. The R and S are defined as R : {(x,y)|y = x+2}, S :{(x,y)|x<y}. Find the Max-Min composition of R and S. [7M]
   b) Discuss fuzzy relations and their role in handling uncertainty. [7M]

(OR)

8. a) Prove the De Morgan's laws using Venn diagrams. [7M]
   b) Define uncertainty in the context of fuzzy set theory. [7M]
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UNIT-V

9. a) Explain the inference mechanism in a fuzzy logic system. [7M]

   b) Elaborate on the design and development of fuzzy logic controllers for Load Frequency Control. [7M]

(OR)

10. a) Discuss the key components and steps involved in making decisions using fuzzy logic. [7M]

    b) Highlight the application of fuzzy logic controllers in Automatic Voltage Regulation. [7M]

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