YMCA UNIVERSITY OF SCIENCE& TECHNOLOGY, FARIDABAD
M.Tech. III SEMESTER ECE
NEURAL NETWORKS & FUZZY LOGICS (E16C-705B)

Time: 3 Hours   **Max. Marks: 60**

Instructions:
1. It is compulsory to answer all the questions (2 marks each) of Part-A in short.
2. Answer any four questions from Part-B in detail.
3. Different sub-parts of a question are to be attempted adjacent to each other.
4. Use of A-4 graph sheets is permitted.

PART –A

Q1 (a) Define a linguistic variable. (2)
(b) State the need of defuzzification. (2)
(c) What is a synaptic junction & what is its importance? (2)
(d) Which one is more complex out of: human neural system and the ANN? (2)
(e) What do you mean by Degree Of Fulfillment (D.O.F.) of a rule? (2)
(f) How is D.O.F. obtained for ANDed clauses & for ORed clauses in a rule? (2)
(g) Is address required to access the contents from an Associative Memory? (2)
(h) What is the simplest learning rule in an NN? State it. (2)
(i) State the purpose of clustering. (2)
(j) In unsupervised learning, is the presence of teacher signal called for? If not, (2) then wherefrom the impetus for learning is derived?

PART –B

Q2 (a) Show theoretically / analyticaily or diagrammaticaily that $A \cup A^c$ # U.O.D. (i.e., (5) Universe of Discourse or Universal Set) and $A \cap A^c$ # Ø (i.e., Null Set) [here symbol # means "Not Equal to"]
(b) Describe any one de-fuzzification technique in detail. (5)

Q3. (a) Discuss the K-means clustering algorithm. (5)
(b) Describe any two knowledge acquisition & knowledge representation methods. (5)

Q4 Explain the working of ART network. (10)

Q5 (a) Explain how fuzzy inferencing (either Individual Rule-based Inferencing Or (8) Composition-based Inferencing) is done. Show the output fuzzy set too.
(b) State the rule base for a practical application of fuzzy control or fuzzy decision (2) making.

Q6 (a) Discuss what issues are at play in competitive learning. (3)
(b) Discuss the limitations of single layer perceptron. (3)
(c) Write a brief technical note on CMAC network. (4)

Q7 (a) Explain the training algorithm for feed-forward back-propagation network. (6)
(b) Discuss one application (such as Pattern Recognition) of NN. (4)

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