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| **Scheme of Valuation/Answer Key**  (Scheme of evaluation (marks in brackets) and answers of problems/key) | | | | | |
| **APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  V SEMESTER B.TECH DEGREE EXAMINATION, JULY 2019 | | | | | |
| **Course Code: CS361** | | | | | |
| |  | | --- | | **Course Name: SOFT COMPUTING** | | | | | | |
| Max. Marks: 100 | | |  | Duration: 3 Hours | |
| **PART A** | | | | | |
|  |  | ***Answer all questions, each carries 3 marks.*** | | | Marks |
| 1 |  | Any 3 importance of Back Propagation Network. | | | (1+1+1) |
| 2 |  | Any 3 application of neural network | | | (1+1+1) |
| 3 |  | Steps for Perceptron Training Algorithm for Single Classes | | | (3) |
| 4 |  | Define activation function and its need | | | (2+1) |
|  |  |  | | |  |
| **PART B** | | | | | |
| ***Answer any two full questions, each carries 9 marks.*** | | | | | |
| 5 | a) | Truth table  When w1=w2=1 compute yin for 4 inputs  When w1=1,w2=-1 compute yin for 4 inputs  Compute ϴ≥ nw-p = 2\*1-1 ≥ 1  y= f(yin) = {1 if yin ≥ 1 , 0 if yin <1} | | | (1+2+2+1+1) |
|  | b) | Two difference between Hard Computing and Soft Computing | | | (2) |
| 6 | a) | Steps in Hebb Training algorithm | | | (6) |
|  | b) | Initial Weights, learning rate, momentum factor, generalization, number of training data, number of hidden layer nodes | | | (6\*0.5) |
| 7 | a) | Explanation of 3 learning techniques with simple example | | | (3\*2) |
|  | b) | Define ADALINE. LMS minimize the mean squared error between the activation and target value | | | (2+1) |
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| **PART C** | | | | | |
| ***Answer all questions, each carries 3 marks.*** | | | | | |
| 8 |  | Union , Intersection and Complement operation with Venn diagram | | | (1+1+1) |
| 9 |  | Excluded middle law and its justification | | | (2+1) |
| 10 |  | Core, Support, Boundary with diagram | | | (1+1+1) |
| 11 |  | A0.6 =  , A0.3 =  , A0+ = | | |  |
|  |  |  | | |  |
| **PART D** | | | | | |
| ***Answer any two full questions, each carries 9 marks.*** | | | | | |
| 12 | a) | µI = 0.667 µR=0.889 µT= 0.111 | | | (3\*2) |
|  | b) | Definition of cardinality of a fuzzy set. And its justification | | | (1+2) |
| 13 | a) | Explanation and figure | | | (1.5\*2) |
|  | b) | RoS= 500 1000 1500 1800  30 0.35 0.4 0.4 0.25  60 0.35 0.6 0.6 0.25  100 0.35 0.67 0.97 0.25  120 0.1 0.1 0.1 0.1 | | | (6) |
| 14 | a) | Max- membership principle, centroid method, weighted average method, mean max membership, center of sums, center of largest area,first of maxima, last of maxima | | | (9) |
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| **PART E** | | | | | |
| ***Answer any four full questions, each carries 10 marks.*** | | | | | |
| 15 | a) | Explanation and block diagram | | | (4+2) |
|  | b) | definition and example of Fuzzy truth qualification, fuzzy probability qualification, fuzzy possibility qualification, fuzzy usuality qualification | | | (1\*4) |
| 16 | a) | Explanation and example of multiple conjunctive antecedents, multiple disjunctive antecedents, conditional statements, NESTED IF-ELSE | | | (1.5\*4) |
|  | b) | Four Main steps in GA - | | | (1\*4) |
| 17 | a) | Explanation and example | | | (1.5\*2) |
|  | b) | Any 3 advantages | | | (3) |
|  | c) | Explanation and example | | | (2\*2) |
| 18 | a) | Explanation of 5 conditions | | | (5) |
|  | b) | Explanation with example of any 5 crossover methods | | | (5) |
| 19 | a) | Any 3 difference between Mamadani FIS and Sugeno FIS | | | (3\*2) |
|  | b) | Stochastic universal sampling with example | | | (2\*2) |
| 20 | a) | Explanation of Cooperative Neural Fuzzy Systems and  General Neuro Fuzzy Hybrid Systems | | | (2\*5) |
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