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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** |
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| **Course Name: SOFT COMPUTING** |

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| 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) |
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| **PART B** |
| ***Answer any two full questions, each carries 9 marks.*** |
| 5 | a) | Truth table When w1=w2=1 compute yin for 4 inputsWhen w1=1,w2=-1 compute yin for 4 inputsCompute ϴ≥ nw-p = 2\*1-1 ≥ 1y= 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 = $\left\{\frac{1}{a}+\frac{1}{b}+\frac{1}{c}+\frac{0}{d}+\frac{0}{e}\right\}$ , A0.3 = $\left\{\frac{1}{a}+\frac{1}{b}+\frac{1}{c}+\frac{1}{d}+\frac{0}{e}\right\}$ , A0+ = $\left\{\frac{1}{a}+\frac{1}{b}+\frac{1}{c}+\frac{1}{d}+\frac{0}{e}\right\}$ |  |
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| **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 andGeneral Neuro Fuzzy Hybrid Systems | (2\*5) |
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