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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**FIFTH SEMESTER B.TECH DEGREE EXAMINATION, DECEMBER 2018 |
| **Course Code: EC360** |
| **Course Name: SOFT COMPUTING** |
| Max. Marks: 100 |  | Duration: 3 Hours |
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| **PART A**  |
|  |  | ***Answer any two full questions, each carries 15 marks.*** | Marks |
| 1 | a) | Soft Computing Definition ( 2 M), At least 5 Application (1 x5=5 M) | ( 7) |
|  | b) | Union (1.5 M), Intersection (1.5 M), Complement (1 M), Bounded sum( 2 M), Bounded difference ( 2 M), | (8) |
| 2 | a) | Example (1 M), Atleast 3 difference (3 x 1= 3 M) | (4) |
|  | b) | Diagram(1 M), Definition (1 M) 3 Features (3x1=3 M)  | (5) |
|  | c) | Example (1 M) (Justification 2 M) | (3) |
|  | d) | Definition (1.5 M) ,Example (1.5 M) | (3) |
| 3 | a) | Example (1 .5 M), Explanation (1.5 M) | (3) |
|  | b) | Demorgans Law (1 M), Proof with Example (3 M) | (4) |
|  | c) | i) R=P x Q (2 M) ii) S = T x Q (2 M) iii) T o R (2 M ) iv) T o S (2 M) | (8) |
| **PART B** |
| ***Answer any two full questions, each carries 15 marks.*** |
| 4 | a) | i)Reflexive (2 M) ii)Symmetric (2 M) and iii) Transitive (3 M)  | (7) |
|  | b) | i)Identity Function Definition + Graph (1M) ,ii) Binary step Function Definition + Graph (1M), iii) Bipolar Step Function Definition + Graph (1.5 M), iv) Binary Sigmoidal Function Definition + Graph (1.5 M), v) Bipolar Sigmoidal function Definition + Graph (1.5 M), vi) Ramp Function (1.5 M) | (8) |
| 5 | a) | Definition defuzzification (2 M) 1. Centre of sums explanation with example (4M)
2. Centroid explanation with example (4 M)
 | (10) |
|  | b) | Five fuzzy connectives (5x1=5M) | (5) |
| 6 | a) | Atleast 4 differences (4x1.5=6 M) | (6) |
|  | b) | Case 1: Net input calculation for each input sample with initial weights as w1=1 & w2=1 ( 3.5 Marks)Case 2 : Net input calculation for each input sample with weights as w1=1 and w2= -1 ( 3.5 Marks)Network with final weight (2 M) | (9) |
| **PART C** |
| ***Answer any two full questions, each carries 20 marks.*** |
| 7 | a) | a) OR function (5 M)b) X-OR function (5 M) | (10) |
|  | b) | Perceptron learning Rule explanation (2 M)Activation Function (1.5M)Weight updation equation (1.5M) | ( 5) |
|  | c) | Architecture diagram of back-propagation network (2 M)Explanation (3 M) | (5) |
| 8 | a) | Atleast 5 Encoding Techniques (5x1=5M) | (5) |
|  | b) | Atleast 4 Application (4 x 1.5=5 M) | (5) |
|  | c) | Atleast 5 crossover techniques with examples (5x2=10) | (10) |
| 9 | a) | GA Definition (2 M)Flowchart (3 M)Explanation (5 M) | (10) |
|  | b) | AND function with bipolar input and targets(2 M) , Calculation of net input and output for each input sample (4 M), Calculation of weights (2 M), Final tabulation (2M) | (10) |
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