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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, DECEMBER 2018 |
| **Course Code: CS361** |
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| **Course Name: SOFT COMPUTING** |

 |
| Max. Marks: 100 |  | Duration: 3 Hours |
| **PART A** |
|  |  | ***Answer all questions, each carries 3 marks.*** | Marks |
| 1 |  | Three points enough each carries (1 mark). | (3) |
| 2 |  | Reason (1 mark) and explanation (2 marks). | (3) |
| 3 |  | Explanation (1 mark), purpose (1 mark) and equation (1 mark). | (3) |
| 4 |  | Purpose of each (0.5 mark) and usage of each of them (between which layers) carries (1 mark) each. | (3) |
| **PART B** |
| ***Answer any two full questions, each carries 9 marks.*** |
| 5 |  | Weight and bias changes and weight for each of the 4 inputs carries (1 mark ), each and steps(1 mark)

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| --- | --- | --- | --- |
| Inputs |  | Weight changes | Weights |
| *x1* | *x2* | *b* | *y* | *∆w1* | *∆w2* | *∆b* | *w1* | *w2* | *b* |
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 1 | -1 | 1 | -1 | -1 | 1 | -1 | 0 | 2 | 0 |
| -1 | 1 | 1 | -1 | 1 | -1 | -1 | 1 | 1 | -1 |
| -1 | -1 | 1 | -1 | 1 | 1 | -1 | 2 | 2 | -2 |

 | (9) |
| 6 |  | Output, Weight and bias changes and weight for each of the 4 inputs carries (1 mark ), each and steps(1 mark). Learning rate parameter can be any value between 0 and 1.Here it is assumed to be 1

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Inputs | Target | Net Input |  | Weight changes | Weights |
| x1 | x2 | 1 | *t* | *yin* | *y* | *∆w1* | *∆w2* | *∆b* | *w1* | *w2* | *b* |
| 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 |
| 1 | 0 | 1 | 1 | 2 | 1 | 0 | 0 | 0 | 1 | 1 | 1 |
| 0 | 1 | 1 | 1 | 2 | 1 | 0 | 0 | 0 | 1 | 1 | 0 |
| 0 | 0 | 1 | -1 | 1 | 1 | 0 | 0 | -1 | 1 | 1 | 0 |

 | (9) |
| 7 | a) | Each steps carries (1 mark). Or flowchart | (5) |
|  | b) | Each of the four inputs yin carries (0.5 marks) each. condition (1 mark) and output (1 mark). According to this table weights are taken as positive and are assumed to be 1

|  |  |  |
| --- | --- | --- |
| (1, 1) | yin = | 2 |
| (1,0) | yin = | 1 |
| (0,1) | yin = | 1 |
| (0,0) | yin = | 0 |

$$θ\geq 2×1-0⟹θ\geq 2$$$$y=f\left(y\_{in}\right)=\left\{\begin{array}{c}1, y\_{in}\geq 2\\0, y\_{in}<2\end{array}\right.$$ | (4) |
| **PART C** |
| ***Answer all questions, each carries 3 marks.*** |
| 8 |  | Any three difference each carries(1 mark). | (3) |
| 9 |  | Max-min composition and Max product composition with example (1.5 marks each). | (3) |
| 10 |  | Relevance (1 mark) and two types (1 mark each). | (3) |
| 11 |  | Give full mark(3marks) if the question is attempted as the fuzzy number is not given in the question. | (3) |
| **PART D** |
| ***Answer any two full questions, each carries 9 marks.*** |
| 12 | a) | i.{0.4} ii. {0.2,0.4,0.6} iii. {0.2,0.6} iv.{Ø} v. {0.6} each carries (1 mark). | (5) |
|  | b) | Explanation on Core, Support, Boundary, Diagram{1 mark each) | (4) |
| 13 | a) | Each carries (2.5 marks)(i)

|  |  |  |  |
| --- | --- | --- | --- |
|  | 1 | 2 | 6 |
| 50 | 0.1 | 0.6 | 0.7 |
| 55 | 0.1 | 0.6 | 0.8 |
| 60 | 0.1 | 0.6 | 0.8 |

(ii)  | (5) |
|  | b) | I~ = 0.833, R~ = 0.889, E~ = 0.8056, IR~ = 0.833Each of them carries (1 mark) | (4) |
| 14 | a) | Any five methods each of them carries (1 mark). | (5) |
|  | b) | Algebraic sum = { $\frac{0.28}{1}$ + $\frac{0.44}{2}$ + $\frac{0.58}{3}$ + $\frac{1}{4}$},Algebraic product = $\{\frac{0.02}{1}$ + $\frac{0.06}{2}$ + $\frac{0.12}{3}$ + $\frac{0.5}{4}$}, Boundedsum ={ $\frac{0.3}{1}$ + $\frac{0.5}{2}$ + $\frac{0.7}{3}$ + $\frac{1}{4}$}, Bounded difference={ $\frac{0.1}{1}$ + $\frac{0.1}{2}$ + $\frac{0.1}{3}$ + $\frac{0.5}{4}$}, each carries (1 mark) | (4) |
| **PART E** |
| ***Answer any four full questions, each carries 10 marks.*** |
| 15 | a) | Five stopping conditions each of them carries(1 mark) | (5) |
|  | b) | Explanation of each of them carries(2 marks) each and example of each carries (0.5 marks). 2+2+0.5+0.5=5 | (5) |
| 16 |  | Explanation with example (3 marks) and seven types each of them carries(1 mark). | (10) |
| 17 | a) | Four types each carries(1 mark) and example (1 mark). | (5) |
|  | b) | Any five difference each of them carries(1 mark). | (5) |
| 18 |  | Explanation (2 mark) and figure (1 mark) and two types each carries (2.5 marks) and each type figures carries(1mark). | (10) |
| 19 |  | Any five with example each of them carries (2 marks) | (10) |
| 20 |  | Any four points of each of them(1.5 marks) and figures of each of them carries(2 marks each ). | (10) |
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