| (Following Paper ID and Roll No. to be filled in your Answer Books) | |
|---|---|
| **Paper ID : 110858** | **Roll No.** |

## B. TECH.

### Theory Examination (Semester-VIII) 2015-16

### SOFT COMPUTING

*Time : 3 Hours*                                        *Max. Marks : 100*

### Section - A

**Note: Attempt all questions from this section.    (2×10=20)**

**1.**  (a)  Brief out necessity of activation function in artificial neuron.

(b)  How population get improved by crossover in genetic algorithm? Brief out.

(c)  Define production and reproduction in genetic algorithm.

(d)  What are modifiers in linguistic hedges?

(e)  Define fuzzification and de-fuzzification with example.

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(f) Define fuzzy if then rules with suitable examples.

(g) What is soft computing? How is it different from conventional computing?

(h) Assume A and B are two fuzzy sets on same universe. When A-B operation produces same result either A or B? Justify.

(i) Explain permutation encoding in genetic algorithm with example.

(j) State the learning rule used in back-propagation network.
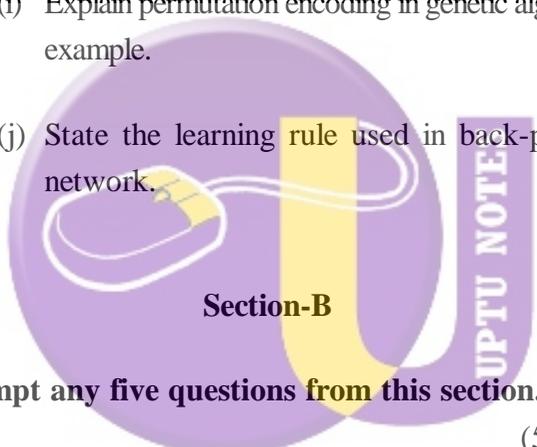
**Section-B**

**2.** **Attempt any five questions from this section.**

$(5\times10 = 50)$

a. Design a Hebb net for bipolar XOR operation.

b. What is back propagation error? Mention the heuristics which will significantly improve the performance of back propagation algorithm.

c. Explain the rank based selection criteria with a suitable example.

d. Draw and explain flow chart of genetic algorithm.

e. What is mutation in genetic algorithm? Explain in detail.

f. Discuss various properties of classical sets.

g. Explain a method of de-fuzzification with example.

h. Consider fuzzy set A={$(x_1,0.4)$, $(x_2,0.2)$,$(x_3,0.7)$} over universe X={$x_1$, $x_2$, $x_3$, $x_4$). For $\alpha$ =2, find power of A fuzzy set.

**Sec tion-C**

**Note : Attempt any two questions from this section.**

$(2\times15 = 30)$

3. Write short notes on

   (a) Hybrid fuzzy controller

   (b) Neuro fuzzy controller

4. Write short notes on

   (a) MATLAB environment for soft computing

   (b) "Survival of the Fittest" - Fitness Computations

5.     Let R, S be defined on fuzzy sets {1, 3, 5, 7} x {1, 3, 5, 7}. Let R:{(x,y)| y=x+2}. S:{(x,y)| x<y} using Max-min find R o S and also find Min-average R o S.