Dr. Meenakshi

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- Feb 2019

B.Tech VIII Semester

COURSE CODE: **13B1WEC831**

COURSE NAME: **SOFT COMPUTING TECHNIQUES** MAX. MARKS:15

COURSE CREDITS: 3 MAX. TIME: 1:00 Hr

***Note:*** *All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.*

**Q1** How is Fuzzy logic different from Probability theory and Crisp Theory? **[2] [CO1]**

**Q2.** Consider two given fuzzy sets **[4] [CO2]**

| | $X_1$ | $X_2$ | $X_3$ | $X_4$ | $X_5$ | $X_6$ |
|---|---|---|---|---|---|---|
| A | 0.1 | 0.6 | 0.8 | 0.9 | 0.7 | 0.1 |
| B | 0.9 | 0.7 | 0.5 | 0.2 | 0.1 | 0 |

Express the following λ– cut set

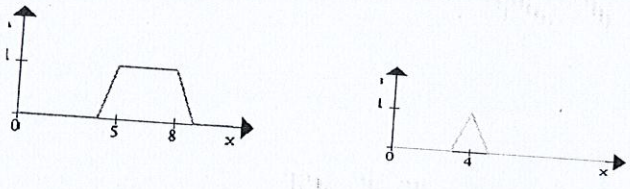
Perform (i) $(AUB)_{0.6}$ (ii) $(AUB')_{0.6}$ (iii) $(A \cap B)_{0.7}$ (iv) $(A' \cap B)_{0.7}$

**Q3** A linguistic variable x which measures the academic excellence is taken from universe of discourse U={ 1 2 3 4 5 6 7 8 9 10}. The membership functions are defined as follows **[1] [CO2]**

μ(Excellent)={(8, 0.2) (9, 0.6) (10 1)}, μ(good)={(6 0.1) (7 0.5) (8, 0.9) (9,1) (10 1)}

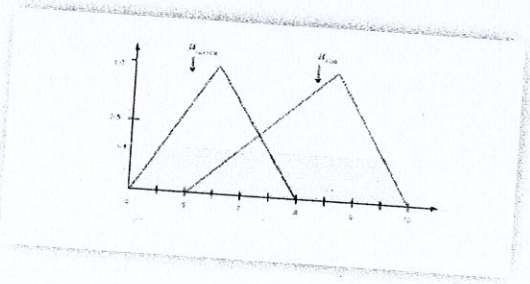
Construct the membership function of *Good but not excellent.*

**Q4** Consider two membership functions **[3] [CO1]**




Find i) AUB (ii) A∩B (iv) A'

**Q5.** The width of a road as narrow and wide is defined by two fuzzy sets, whose membership functions are plotted as shown above. If a road with its degree of membership value is 0.4 then what will be its width (in crisp) measure. **[2] [CO5]**



**Q6.** Find the two relational compositions of the fuzzy sets. **[3] [CO2]**

$$P(x,y) = \begin{bmatrix} 0.3 & 0.5 & 0.8 \\ 0.0 & 0.7 & 1.0 \\ 0.4 & 0.6 & 0.5 \end{bmatrix}_{\circ} \qquad Q(x,y) = \begin{bmatrix} 0.9 & 0.5 & 0.7 & 0.7 \\ 0.3 & 0.2 & 0.0 & 0.9 \\ 1.0 & 0.0 & 0.5 & 0.5 \end{bmatrix}$$