H.T.No. | | | | | | | | | | |

Code No: MA1507 **GEC-R14**

III B. Tech I Semester Supplementary Examinations, July 2017

FUZZY MATHEMATICS

(Open Elective-I)

Time: 3 Hours **Max. Marks: 60**

Note: All Questions from **PART-A** are to be answered at one place.
Answer any **FOUR** questions from **PART-B.** All Questions carry equal Marks.

PART-A

6 × 2 = 12M

1. What is the use of membership function?
2. Give an example for empty fuzzy set and universal fuzzy set.
3. Define algebraic product and sum of two fuzzy sets.
4. Distinguish between crisp relation and fuzzy relation.
5. Show that the connective NAND is commutative.
6. State fuzzy subgroup.

PART-B

4 × 12 = 48M

1. a) Model a reasonable membership function for the following fuzzy subsets i) Height's around 6 feet ii) Numbers approximately between 11 and 21. (6M)

   b) Define any three features of a membership function with an example. (6M)

2. a) Find disjunctive sum of fuzzy sets $\underline{A}=\{(a,0.8),(b,0.7),(c,0.1)\}$ and $\underline{B}=\{(a,0.5),(b,0.2),(c,0.6)\}$. (6M)

   b) Given A= { (x, 0.1), (y, 0.11), (z, 0.92), (w, 0.8)} and B = {(x, 0.99), (y, 0.88), (z, 0.1), (w, 0.21)} are fuzzy subsets. Find $A \cup B$, A|B and $A \cup B^C$. (6M)

3. a) Show that associative holds in fuzzy sets under algebraic sum. (6M)

   b) Given two fuzzy sets $\underline{A}=\{(x_1,0.9),(x_2,0.2),(x_3,0.8)\}\&\underline{B}=\{(y_1,1),(y_2,0),(y_3,0.45)\}$ on universe X={x_1,x_2,x_3} & Y={ y_1,y_2,y_3}. Find Cartesian product of A and B. (6M)

4. a) Explain any three crisp connectives with an example. (6M)

   b) Write an equivalent formula for P ^(Q ⇔ R) ν (R ⇔ P) which does not involve conditional as well as biconditional. (6M)

5. a) Show that ↑ is not associative. (6M)

   b) Let $\underline{A}$: sita is brilliant , $\underline{B}$: Lakshmana is handsome GivenT $(\underline{A})=0.63$, T($\underline{B}$) =0.9 Find the truth value of $\underline{A}\wedge(\underline{A}\rightarrow\underline{B})$ and $\underline{B}\vee(\underline{A}\rightarrow\underline{B})$. (6M)

6. a) Prove that characteristic function on T is a fuzzy subgroup if T is a subgroup of G. (6M)

   b) What are necessary and sufficient conditions for a fuzzy set μ of a ring (R,+, .) to be a subring? (6M)

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