Mon Tue Wed Thu Fri Sat

تاریخ: _____

Mid-Term Quiz

Lecture # 1-22

OPPO A31
2022/07/05 17:58

Mon Tue W-d Thu Fri Sat

Grand Test

تاریخ: _____

Mth645 Lec # 1-7

Question NO: 01 :- MCQ's

1) if $X=\{1,2,3,4,5\}$ then $P(X)=?$
tell about no of elements of Power set ?
(a) 36 (b) 32 ✓ (c) 38 (d) 39

2) $\chi_A(x) = 1$ if
(a) ✓ $x \in A$ (b) $x \notin A$

3) $\chi_A(x) = 0$ if
(a) $x \in A$ (b) ✓ $x \notin A$

4) $A \cup B = $ — ?
(a) $\chi_A(x) \wedge \chi_B(x)$ (b) ✓ $\chi_A(x) \vee \chi_B(x)$

5) $A = \int \frac{\mu_A(x)}{x}$ is for — ?
(a) discrete case (b) ✓ continuous case

6) $\tilde{A} = \{(x_1, 0), (x_2, 0.2)\}$
(a) Normal set
(b) ✓ Not a normal set

Mon Tue Wed Thu Fri Sat

تاریخ:

7) $A = \{(x_1, 1), (x_2, 0), (x_3, 1)\}$, $|A| = ?$

(a) 2 (b) 3 (c) 4 (d) 5

8) $S(\vec{A}, \vec{B}) \in$ — ?

(a) $(0, 1)$ (b) $[0, 1]$

9) $[a_1, b_1] \subseteq [a_2, b_2]$ iff — ?

(a) $a_1 \leq a_2$ and $b_1 \leq b_2$

(b) $a_2 \leq a_1$ and $b_1 \leq b_2$

10) $I_1 = [3, 5]$, $I_2 = [6, 7]$

(a) $I_1 < I_2$ (b) $I_1 > I_2$

Question No: 02 :- Short Ques

Grand Test

Mth645 Lec 12-15

MCQ's:-

1) $\prod_{i=1}^{n} A_i = -?$

(a) A^2 (b) A^3 (c) A^n ✓

2) $(a,b) = (b,a)$ in cartesian product.

(a) True (b) False. ✓

3) Binary relation is subset of —?

(a) Fuzzy relation (b) cartesian product. ✓

4) Many to one is also called —?

(a) ✓ Susjection (b) injection.

5) Injection also called —?

(a) ✓ Into, one to one

(b) Into, onto

6) R is said to be bijection if it is both —?

(a) One to many and one-to-one

(b) ✓ Many to one and Into.

Mon Tue Wed Thu Fri Sat

7) How many representation method of Relation.
(a) 3 (b) 4 (c) 2 (d) 5

8) $m_{ij} = 1$ if
(a) $(a_i, b_j) \in R$ (b) $(a_i, b_j) \notin R$.

9) $R = \{(a, c), (b, d)\}$. Dom $(R) = ?$
(a) $\{a, b\}$ (b) $\{c, d\}$ (c) $\{a, c\}$

10) $M_R + M_S = —?$
(a) $M_{R \cap S}$ (b) $M_{R \cup S}$ (c) $M_{R \cdot S}$.

Short Ques.

1) Define directed graph?

2) Define one to one correspondence

3)
$$R = \begin{array}{c} \\ x_1 \\ x_2 \\ x_3 \\ x_4 \end{array} \begin{array}{c} \begin{array}{cccc} x_1 & x_2 & x_3 & x_4 \end{array} \\ \begin{bmatrix} 0.2 & 0 & 0.5 & 0 \\ 0 & 0.3 & 0.7 & 0.8 \\ 0.1 & 0 & 0.4 & 0 \\ 0 & 0.6 & 0 & 0.1 \end{bmatrix} \end{array}$$

write dom (R) and Rang (R).

4) Define Complement of fuzzy relations.

Mon Tue W-d Thu Fri Sat

Grand Test

MTH645 Lec # 16-18

Question No:01 MCQ's.

1) Triangular norms and co-norms were first introduced by Theory of -?

(a) ✓ Probabilistic metric spaces.

(b) topological spaces.

2) How many conditions exists for T-norm?

(a) 1 (b) 3 (c) ✓ 4 (d) 6

3) $x \Delta_3 y =$ —?

(a) xz (b) ✓ xy (c) $x+y$

4) For triangular norm the binary operation is-

(a) ✓ delta (b) Nebla

5) For co-norm the binary operation -?

(a) ✓ Nebla (b) delta.

6) $0 \Delta x =$ —?

(a) 1 (b) ✓ 0 (c) ∞

7) $x \Delta_5 y =$ —?

(a) xy (b) ✓ $x \wedge y$ (c) $x \vee y$

Mon Tue Wed Thu Fri Sat

تاریخ:

8) $x \Delta_3 y$ is not t-norm.

(a) true (b) False.

9) $x \Delta_4 y$ is not t-norm.

(a) true (b) False.

10) $x \leq y \Rightarrow -x \geq -y$

(a) True (b) False.

Question NO:02 Short Ques.

1) Define t-norm?

2) Define co-norm?

3). Write some examples of t-norm.

4) Prove $0 \Delta x = 0$

5) Prove $x \Delta_2 (y \Delta_2 z) = (x \Delta_2 y) \Delta_2 z$

Long Ques. Ques # 03

1) Check min is t-norm or not?

2) Check $x \Delta_3 y$ is t-norm or not?

3) Check $x \Delta_4 y$ is t-norm

Mon Tue Wed Thu Fri Sat

Grand Test

Mth645 Lec #21, 22

Question No: 01 MCQ's

1) if $\max(x,y) \neq 1$ then $x \Delta_0 y =$ —
(a) 0 (b) = 1 (c) $\min(x,y)$

2) $\Delta_2 \geq \Delta_3$
(a) True (b) False

3) $T(x,0) =$ —
(a) 0 (b) 1 (c) 2

4) $S(x,1) =$ —
(a) 1 (b) 0 (c) 2

5) $S(1,0) =$ —
(a) 1 (b) 0 (c) 2

6) $f(x) = x^8$ then $f^{-1}(x) =$ —
(a) y (b) $x^{1/8}$ (c) $y^{1/8}$

7) $f(x) = x$ Then $f^{-1}(x) =$ —
(a) $\frac{1}{x}$ (b) x^3 (c) x

Which statement is correct

5 (a) Λ (union) with 0 is always 0

(b) Λ (union) with 0 is always positive.

(c) V (union with 0 cannot be negative.

6 Δ_1, Δ_2, Δ_3 and Δ_4 all are _____ t-norm.

(a) Convex (b) Idempotent

(c) Archimedean. (c) None of these

MTH645

Lecture # 19, 20

Choose the correct answer.

1. Δ is idempotent if $x \Delta x =$ _____ $\forall\ x \in [0,1]$

(a) 1 (b) x (c) 0 (d) None

2. A t-norm is Archimedean, if it is _____ and $\forall\ a,b \in (0,1)$ $\exists$ a positive integer n s.t

(a) convex $[a]^n = a \Delta a \Delta a \Delta a < b$.

(b) concave $[a]^n = a \Delta a \Delta a \Delta \ldots < b$.

(c) convex $[a]^n = a \Delta a \Delta a \Delta \ldots \Delta a < b$.

(d) all of the above

3. $[a]^5$ is Archimedean t-norm

(a) true (b) false

4. Min is t-norm as well as archimedean t-norm

(a) true (b) false

MTH645

Lecture # 19, 20

Choose the correct answer.

1. Δ is idempotent if $x \Delta x =$ _____ $\forall\ x \in [0,1]$

(a) 1 (b) x (c) 0 (d) None

2. A t-norm is Archimedean, if it is _____ and $\forall\ a, b \in (0,1)$ $\exists$ a positive integer n s.t

(a) convex $[a]^n = a \Delta a \Delta a \Delta a < b$.

(b) concave $[a]^n = a \Delta a \Delta a \Delta \ldots < b$.

(c) convex $[a]^n = a \Delta a \Delta a \Delta \ldots \Delta a < b$.

(d) all of the above

3. $[a]^5$ is Archimedean t-norm

(a) true (b) false

4. Min is t-norm as well as archimedean t-norm

(a) true (b) false

4 $\min(1, x) =$ ____ ?

(a) 0
(b) 1
(c) x
(d) None of these

5 Following is NOT the property of t-norm:

(a) $x \Delta y = y \Delta x$
(b) $0 \Delta x = x$
(c) $(x \Delta y) \Delta z = x \Delta (y \Delta z)$
(d) $1 \Delta x = x$.

6 $\max(1, \emptyset) =$ ____ ??

(a) 0
(b) $\emptyset$
(c) 1
(d) None.

$x \Delta_3 y = xy$ is not a t-norm

(a) true (b) False

MTH645

Lecture 16 - 18

Choose the correct answer

1. If $1 \Delta x = x$ satisfies for t-norm then it is true for,

(a) $1 \Delta_1 x = x$

(b) $1 \Delta_2 x = x$

(c) $1 \Delta_3 x = x$

(d) All of the above.

2. The binary operation for t-conorm will be:

(a) $\Delta : [0, 1]^2 \longrightarrow [0, 1]$

(b) $\Delta : [0, 1] \longrightarrow [0, 1]$

(c) $\nabla : [0, 1]^2 \longrightarrow [0, 1]$

(d) $\nabla : [0, 1] \longrightarrow [0, 1]$.

3. The binary operator nebla (∇) is used to represent ——.

(a) t-norm

(b) t-conorm

(c) both of these.

9

The distance between the points $\frac{x-a}{a_2-a_1}$ and $\frac{a_3-x}{a_3-a_2}$ in triangular fuzzy number is known as _____

(a) Diagonal (b) α- cut

(c) Chord (d) Tangent

10 According to the properties of α- cut, the interval of A_α become decrease/smaller when the value of α- cut _____.

(a) decrease

(b) same as A_α

(c) increases

(d) (b) and (c) both.

4 There is only ___ maximum value at only one point in ___ fuzzy number.

(a) Triangular (b) Trapezoidal
(c) Cartesian (d) All of the above

5 The negative of triangular fuzzy number $\tilde{A} = (6, 7, 8)$ is

(a) $\tilde{A} = (-6, -7, -8)$

(b) $\tilde{A} = (-8, -7, -6)$

(c) $\tilde{A} = (-7, -6, -8)$

(d) None of these

6 If $\tilde{A} = (2, 4, 6)$ and $\tilde{B} = (3, 6, 7)$ the multiplication $\tilde{B} \times \tilde{A} =$

(a) $(6, 24, 42)$

(b) $(24, 15, 14)$

(c) None of these

8 $\tilde{A} - \tilde{B}$ and $\tilde{B} - \tilde{A}$ in triangular fuzzy numbers are always equal

(a) True (b) False

MTH645

Lecture 8 - 11 Total Marks: 35

Choose the correct answer: 1 * 10 = 10

1. The convex condition

$(\alpha' < \alpha) \Rightarrow \left(a_1^{(\alpha')} \leq a_1^{(\alpha)}, a_3^{(\alpha')} \leq a_3^{(\alpha)}\right)$

can also be written as:

(a) $\alpha' < a \Rightarrow A\alpha' \subset A\alpha$

(b) $\alpha' < a \Rightarrow A\alpha' = A\alpha$

(c) $\alpha' < a \Rightarrow A\alpha' > A\alpha$

(d) $\alpha' < a \Rightarrow A\alpha \subset A\alpha'$

2. According to the convex condition the α-cut is:

(a) discrete

(b) finite

(c) definite

(d) continous.

3. The triangular fuzzy number is always represented in _____ points

(a) 1 (b) 2

(c) 3 (d) 4

10 If $I_1 = [2, 3]$ and $I_2 = [0, 2]$

the intersection $I_1 \wedge I_2$ is :

(a) $[1, 2]$

(b) $[0, 3]$

(c) Undefined

(d) None of these

Ans the following: $2 * 3 = 6$

11 Find the inclusion of I_1 in I_2

where $I_1 = [2 \quad 6]$; $I_2 = [3 \quad 7]$

12 Define support of fuzzy set and give example

13 If $\tilde{B} = \{(x_1, 0.5), (x_2, 0.7), (x_3, 0.6), (x_4, 1), (x_5, 0)\}$

then find $\overline{\tilde{B}}$??

Ans the following $3 * 3 = 9$

14 If $C = \{7, 8, 9\}$, $D = \{2, 4, 7\}$

then find

$A \cup B \longrightarrow \chi_{A \cup B}(x)$

where $x \in C$ or $x \in D$

7. The fuzzy set $\tilde{A} : R \to [0,1]$ defined by $\tilde{A}(x) = e^{-x^2}$ is normal at

(a) $x = 1$

(b) $x = 0$

(c) $x = 1.5$

(d) $x = 0.5$,

8. The degree of subset hood of $\tilde{B}$ in $\tilde{A}$ is defined as

(a) $S(\tilde{A}, \tilde{B}) = \frac{|\tilde{A} \cap \tilde{B}|}{|\tilde{A}|}$

(b) $S(\tilde{A}, \tilde{B}) = \frac{|\tilde{A} \cap \tilde{B}|}{|\tilde{B}|}$

(c) $S(\tilde{B}, \tilde{A}) = \frac{|\tilde{B} \cap \tilde{A}|}{|\tilde{B}|}$

(d) $S(\tilde{B}, \tilde{A}) = \frac{|\tilde{B} \cap \tilde{A}|}{|\tilde{A}|}$

9. Cardinality of fuzzy set C is _____ where $C = \{(a, 0.5), (b, 0.6), (c, 0.7)\}$

(a) 2 (b) 1.8 (c) 1.6 (d) 2.5

4 :- If $A \subseteq B$, $B = \{a, b, c, d, e\}$

$A = \{c, d, e\}$ then

$\chi_A(c) =$ ____

(a) 0

(b) 1

5. Fuzzy logic is an approach to computing based on :

(a) Degree of truth and false

(b) Degree of truth or false

(c) Degree of truth

(d) None of these.

6 If $A = \{(2, 0.4), (4, 0.6), (5, 1)\}$

the membership value of 4 is ____

(i.e $\mu_A(4) =$ ____ .)

(a) 0.4

(b) 1

(c) 0.6

(d) 0

Ourself!! :-)

MTH645 Fuzzy logics

Lecture 1-7 Total Marks: 35

Choose the correct answer (10) = 1 * 10

1- If X and Y are two sets then the function defined as :

(a) It assigns elements of x to element of y

(b) It assigns unique elements of x to unique elements of y

(c) It assigns element of x to unique elements of y

2- If $A \subseteq X$ and $X = \{3, 4, 5, 6\}$ $A = \{4, 5\}$. then $\chi_A(4) =$ ____

(a) 1

(b) 0

3:- The membership value of any fuzzy set lie in the interval

(a) $(0, 1]$ (b) $(0, 1)$

(c) $[0, 1)$ (d) $[0, 1]$

GRAND TEST

Math 645

Lec No: 8 - 11

MCQS

1) The Convex Condition may be written as $(\alpha' < \alpha) \Rightarrow$ _____

(a) $A_\alpha < A_{\alpha'}$ (b) $A_{\alpha'} < A_\alpha$

2) The Negative Triangular Fuzzy Number of (6, 5, 9)

(a) (-6, -5, -9) (b) (-9, -5, -6)

3) A_α = _____

(a) $[\alpha_1, \alpha_3]$ (b) $[\alpha_1, \alpha_2]$

4) The Inverse of Trapezodial Number of (4, 5, 6)

(a) $(\frac{1}{6}, \frac{1}{5}, \frac{1}{4})$ (b) $(\frac{1}{4}, \frac{1}{5}, \frac{1}{6})$

5) The Negative of Triangular Fuzzy Number is Denoted as:

(a) $-\tilde{A}$ (b) $-A$

6) R^n = _____

(a) Dimensional Euclidian vector

(b) Non Dimensional Euclidian vector Space

GRAND TEST

Maths: (645)

Lec 19-20

Q No: 1 M.C.Q.s

1) Δ is idempotent If $x \Delta x$ = ____
(a) Δx ✓(b) x (c) xx

2) $C = r\Delta S$ Where Δ is ____
✓(a) convers T-norm (b) Archimedean

3) Min is an Archimedean T-norm
(a) True ✓(b) False

4) $\Delta_1, \Delta_2, \Delta_3$ and Δ_4 are all Archimedean T-norm
✓(a) True (b) False

5) Δ is archimedean T-norm
So $[a]^n > b$
(a) True ✓(b) False

6) If Δ is Archimedean t-norm Then $\forall$ a, b $\in$ ____
✓(a) $(0,1)$ (b) $[0,1)$ (c) $[0,1]$

RAND TEST
Maths: 645:

Question No: 1 M.C.Qs

i) $\prod_{i=1}^{n} A_i =$ ____

(a) A^n (b) A^i (c) A^m

ii) If $m_{ij} = 1$ Then ____

(a) $(a_i, b_j) \in R$ (b) $(a_i, b_i) \notin R$

iii) If $m_{ij} = 0$ Then ____

(a) $(a_i, b_j) \in R$ (b) $(a_i, b_i) \notin R$

iv) Directed Graph is also called- ____

(a) Digraph (b) Bigraph

v) Fuzzy Relation has degree of membership value lies in ____

(a) $(0, 1)$ (b) $[0, 1]$ (c) $[0, 2]$

vi) Sum $A+B =$ ____

(a) $\max[a_{ij}, b_{ij}]$ (b) $\min[a_{ij}, b_{ij}]$

vii) If $A \leq B$ Then ____

(a) $SA \leq SB$ (b) $SA \geq SB$

viii) $M_{R \cup S} =$ ____

(a) $M_R + M_S$ (b) $M_R - M_S$

ix) $M_{S \circ R} = M_R \cdot M_S$

(a) True (b) False