

## Unit 3 - Week 1 :

### Course outline

How does an NPTEL online course work?

#### Week 0

#### Week 1 :

- Lecture 1 : Introduction to Fuzzy Sets
- Lecture 2 : Introduction to Fuzzy Sets (Contd.)
- Lecture 3 : Introduction to Fuzzy Sets (Contd.)
- Lecture 4 : Introduction to Fuzzy Sets (Contd.)
- Lecture 5 : Introduction to Fuzzy Sets (Contd.)
- Lecture 6 : Introduction to Fuzzy Sets (Contd.)
- Lecture Materials

#### Quiz : Assignment 1

- Week 1 Feedback Form

#### Week 2 :

#### Week 3 :

#### Week 4 :

#### Week 5 :

#### Week 6 :

#### Week 7 :

#### Week 8 :

### DOWNLOAD VIDEOS

### Text Transcripts

### Assignment Detailed Solution

## Assignment 1

The due date for submitting this assignment has passed. As per our records you have not submitted this assignment.

**Due on 2020-03-04, 23:59 IST.**

1) Which one of the following statements is TRUE?

2 points

- a. Law of excluded middle is followed by Fuzzy set but not Crisp set.
- b. Law of excluded middle is followed by Crisp set but not Fuzzy set.
- c. Law of excluded middle is followed by both Crisp and Fuzzy sets.
- d. Law of excluded middle is followed by neither Crisp set nor Fuzzy set.

- a.  
 b.  
 c.  
 d.

No, the answer is incorrect.  
 Score: 0

Accepted Answers:

b.

2) Which one of the following statements is TRUE?

2 points

- a. De Morgan's Laws are followed by Crisp set but not Fuzzy set.
- b. De Morgan's Laws are followed by Fuzzy set but not Crisp set.
- c. De Morgan's Laws are followed by neither Crisp set nor Fuzzy set.
- d. De Morgan's Laws are followed by both Crisp and Fuzzy sets.

- a.  
 b.  
 c.  
 d.

No, the answer is incorrect.  
 Score: 0

Accepted Answers:

d.

3) Fig. A shows trapezoidal membership function distribution of a fuzzy set.

2 points

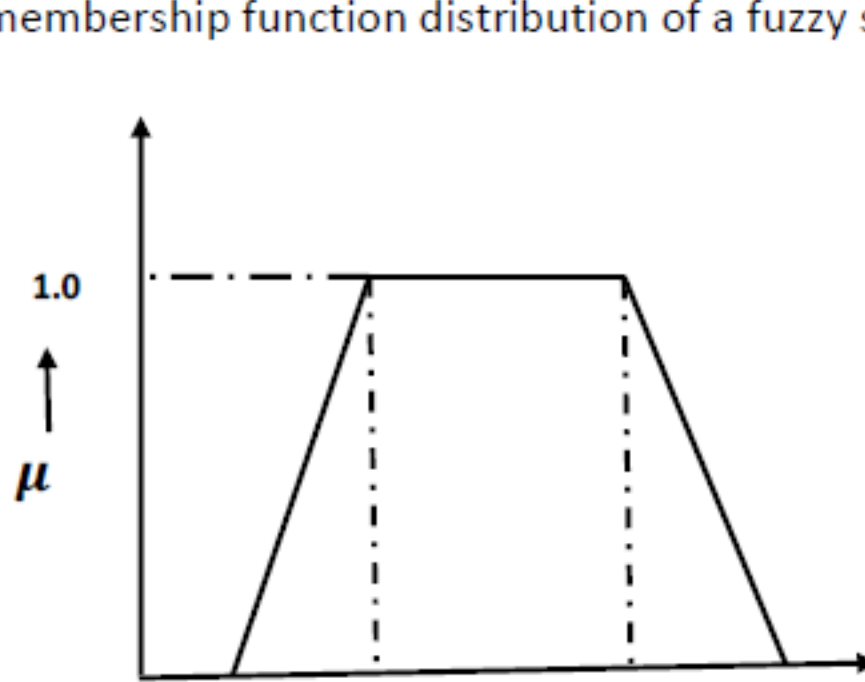


Fig. A: Trapezoidal membership function distribution.

The value of membership ( $\mu$ ) corresponding to  $x = 3.5$  is found to be equal to

- a. 0.45
- b. 0.55
- c. 0.65
- d. 0.75

- a.  
 b.  
 c.  
 d.

No, the answer is incorrect.  
 Score: 0

Accepted Answers:

d.

4) Let us consider a fuzzy set  $A(x)$  as follows:

2 points

$$A(x) = \{(x_1, 0.2), (x_2, 0.3), (x_3, 0.4)\}$$

Its scalar cardinality is found to be equal to:

- a. 0.8
- b. 0.9
- c. 0.1
- d. 0.4

- a.  
 b.  
 c.  
 d.

No, the answer is incorrect.  
 Score: 0

Accepted Answers:

b.

5) Let us consider a fuzzy set  $A(x)$  as follows:

2 points

$$A(x) = \{(x_1, 0.1), (x_2, 0.3), (x_3, 0.5)\}$$

Its CONCENTRATION is determined as

- a.  $\{(x_1, 0.32), (x_2, 0.55), (x_3, 0.71)\}$ .
- b.  $\{(x_1, 0.01), (x_2, 0.09), (x_3, 0.25)\}$ .
- c.  $\{(x_1, 0.5), (x_2, 0.3), (x_3, 0.1)\}$ .
- d.  $\{(x_1, 0.1), (x_2, 0.2), (x_3, 0.3)\}$ .

- a.  
 b.  
 c.  
 d.

No, the answer is incorrect.  
 Score: 0

Accepted Answers:

b.

6) Let us consider two fuzzy sets:

2 points

$$A(x) = \{(x_1, 0.1), (x_2, 0.2), (x_3, 0.3), (x_4, 0.4)\}$$

$$B(x) = \{(x_1, 0.2), (x_2, 0.3), (x_3, 0.4), (x_4, 0.5)\}$$

Their UNION  $(A \cup B)(x)$  is determined as

- a.  $\{(x_1, 0.2), (x_2, 0.3), (x_3, 0.4), (x_4, 0.5)\}$
- b.  $\{(x_1, 0.1), (x_2, 0.2), (x_3, 0.3), (x_4, 0.4)\}$
- c.  $\{(x_1, 0.4), (x_2, 0.3), (x_3, 0.2), (x_4, 0.1)\}$
- d.  $\{(x_1, 0.5), (x_2, 0.4), (x_3, 0.3), (x_4, 0.2)\}$

- a.  
 b.  
 c.  
 d.

No, the answer is incorrect.  
 Score: 0

Accepted Answers:

a.

7) Let us consider two fuzzy sets as follows:

2 points

$$A(x) = \{(x_1, 0.1), (x_2, 0.2), (x_3, 0.3)\}$$

$$B(x) = \{(x_1, 0.3), (x_2, 0.4), (x_3, 0.5)\}$$

Their Algebraic sum,  $A(x) + B(x)$  is represented as follows:

- a.  $\{(x_1, 0.4), (x_2, 0.6), (x_3, 0.8)\}$ .
- b.  $\{(x_1, 0.3), (x_2, 0.4), (x_3, 0.5)\}$ .
- c.  $\{(x_1, 0.1), (x_2, 0.2), (x_3, 0.3)\}$ .
- d.  $\{(x_1, 0.37), (x_2, 0.52), (x_3, 0.65)\}$ .

- a.  
 b.  
 c.  
 d.

No, the answer is incorrect.  
 Score: 0

Accepted Answers:

d.

8) Let us consider two fuzzy sets as follows:

2 points

$$A(x) = \{(x_1, 0.2), (x_2, 0.3), (x_3, 0.4)\}$$

$$B(x) = \{(x_1, 0.3), (x_2, 0.4), (x_3, 0.5)\}$$

Their bounded sum,  $A(x) \oplus B(x)$  is represented as follows:

- a.  $\{(x_1, 0.5), (x_2, 0.7), (x_3, 0.9)\}$
- b.  $\{(x_1, 0.4), (x_2, 0.3), (x_3, 0.2)\}$
- c.  $\{(x_1, 0.5), (x_2, 0.4), (x_3, 0.3)\}$
- d.  $\{(x_1, 0.2), (x_2, 0.3), (x_3, 0.4)\}$

- a.  
 b.  
 c.  
 d.

No, the answer is incorrect.  
 Score: 0

Accepted Answers:

a.

9) Let us consider two fuzzy sets as follows:

2 points

$$A(x) = \{(x_1, 0.3), (x_2, 0.4), (x_3, 0.5)\}$$

$$B(x) = \{(x_1, 0.5), (x_2, 0.6), (x_3, 0.7)\}$$

Their Algebraic difference,  $A(x) - B(x)$  is determined as follows:

- a.  $\{(x_1, 0.5), (x_2, 0.6), (x_3, 0.7)\}$
- b.  $\{(x_1, 0.3), (x_2, 0.4), (x_3, 0.5)\}$
- c.  $\{(x_1, 0.7), (x_2, 0.6), (x_3, 0.5)\}$
- d.  $\{(x_1, 0.3), (x_2, 0.4), (x_3, 0.3)\}$

- a.  
 b.  
 c.  
 d.

No, the answer is incorrect.  
 Score: 0

Accepted Answers:

d.

10) Let us consider two fuzzy sets as follows:

2 points

$$A(x) = \{(x_1, 0.1), (x_2, 0.2), (x_3, 0.5)\}$$

$$B(x) = \{(x_1, 0.4), (x_2, 0.5), (x_3, 0.6)\}$$

Their bounded difference,  $A(x) \ominus B(x)$  is determined as follows:

- a.  $\{(x_1, 0.0), (x_2, 0.0), (x_3, 0.1)\}$
- b.  $\{(x_1, 0.5), (x_2, 0.2), (x_3, 0.1)\}$
- c.  $\{(x_1, 0.6), (x_2, 0.5), (x_3, 0.4)\}$
- d.  $\{(x_1, 0.1), (x_2, 0.2), (x_3, 0.5)\}$

- a.  
 b.  
 c.  
 d.

No, the answer is incorrect.  
 Score: 0

Accepted Answers:

a.