Birla Institute of Technology & Science, Pilani (Rajasthan)
Department of Electrical & Electronics Engineering
BITS F312 Neural Network & Fuzzy Logic
Quiz 1, Aug 24,2016, Set: A

Duration:25 mins **Max. Marks: 25**

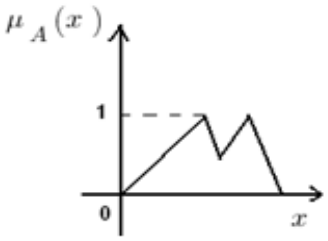
Name: _____ **ID:** | | | | | | | | | | | | |

Instructions:

1. **This question paper contains 2 pages.**
2. **Write your name & ID in the space provided.**
3. **Write the answers in the space provided.**
4. **Overwritten answers will not be considered for rechecks.**

Fill in the blanks (1 mark for each blank)

1. IBM Watson is a _____ that combines artificial intelligence (AI) and sophisticated analytical software for optimal performance as a question answering machine.
2. A = 0.3/1 + 0.5/2 + 1/3; B = 0.5/1 + 0.55/2 + 1/3, then A is a _____ of B.
3. Asimov formulated three laws of _____.
4. The first paper on fuzzy sets was published by Professor _____ in 1965.
5. _____ is frequently credited for being the Father of theoretical computer science and artificial intelligence.
6. If the secondary membership function is at its maximum of 1[defined] at every point, we speak of an _____ set.
7. As of June 2016, the fastest supercomputer in the world is the Sunway TaihuLight, with a Linpack benchmark of 93 PFLOPS, made by the country _____.
8. _____ and _____ operators are used for reshaping the membership functions.
9. _____ modeling is an area of computer science that deals with simulating human problem solving and mental task processes in a computerized model.
10. Fuzyy set shown below according to degree of membership and shape of the membership function is _____ and _____ respectively.



11. _____ is a set of algorithms in machine learning, whereby machines figure out which rules to follow based on the data researchers feed them.
12. Entropy of Crisp set is _____.
13. If Fuzzy set A = 0.2/1+0.4/2+1/3+0.6/4, cardinality of set A= _____

Numericals

1. Given U = {1, 2, 3, 4, 5, 6, 7} A = {(3, 0.7), (5, 1), (6, 0.8)} then...

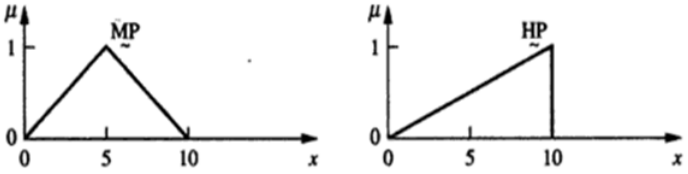
[2 marks]

Solution:

$\tilde{A}$ =

2. The base station controls the power output of the mobile. Medium power(MP) and High power (HP) fuzzy set in power control of mobile cellular phone transmitting to its base station are given below. 'x' is in dBm (power ratio in decibels (dB) of the measured power referenced to one milliwatt (mW)). Draw *properly labeled* diagrams showing intersection of MP & HP, and difference between MP & HP.

[2+2=4 marks]



Solution:

Intersection **Difference**

3. If A = 0.2/a+0.8/b+0.8/c+0.75/d; B=0.5/a+0.3/b+0.2/c+0.15/d .
Find A U B and A BOLDUNION B.

[2+2=4 marks]

Solution:

A U B =

A BOLDUNION B =

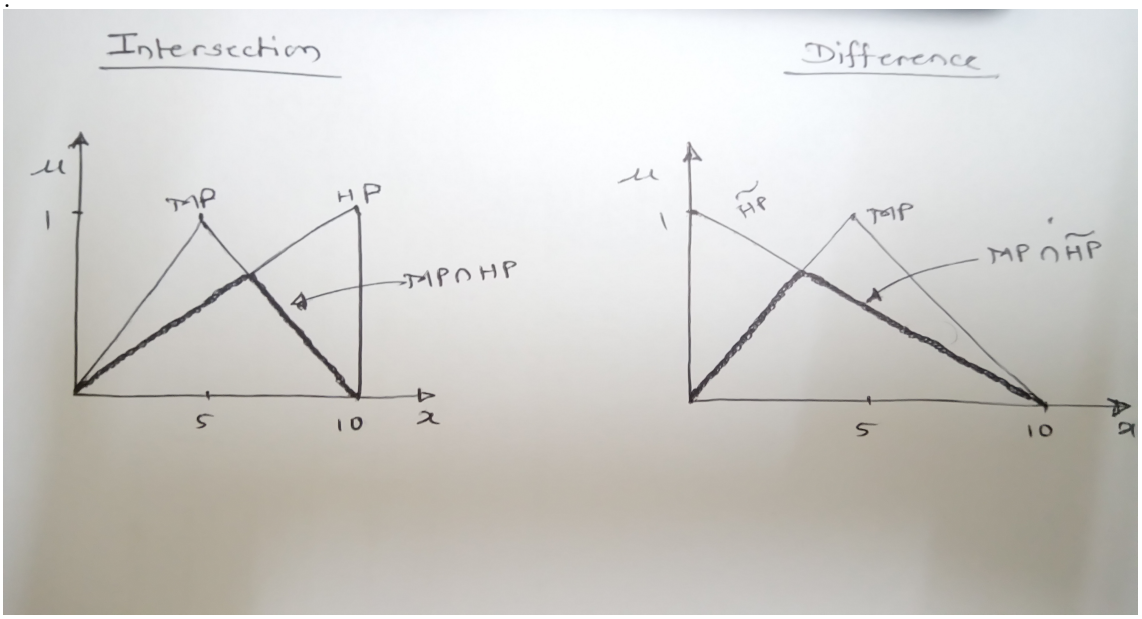
Answer Key for Exam A

Fill in the blanks (1 mark for each blank)

1. supercomputer.
2. subset.
3. Robotics.
4. Lotfi Zadeh.
5. Alan Turing.
6. interval type-2.
7. China.
8. CON, DIL.
9. Cognitive.
10. Normal, Non-Convex.
11. deep learning.
12. zero.
13. 2.2.

Numericals

1. . $\tilde{A} = \{(1, 1), (2, 1), (3, 0.3), (4, 1), (6, 0.2), (7, 1)\}$.
2. .



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3. . A U B = 0.5/a+0.8/b+0.8/c+0.75/d

   A BOLDUNION B = 0.7/a+1/b+1/c+0.9/d .

Birla Institute of Technology & Science, Pilani (Rajasthan)
Department of Electrical & Electronics Engineering
BITS F312 Neural Network & Fuzzy Logic
Quiz 1, Aug 24,2016, Set: B

Duration:25 mins **Max. Marks: 25**

Name: _____ **ID:** | | | | | | | | | | | | |

Instructions:

1. **This question paper contains 2 pages.**
2. **Write your name & ID in the space provided.**
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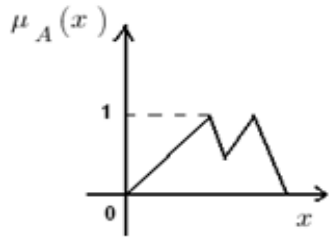
4. **Overwritten answers will not be considered for rechecks.**

Fill in the blanks (1 mark for each blank)

1. _____ is frequently credited for being the Father of theoretical computer science and artificial intelligence.
2. _____ modeling is an area of computer science that deals with simulating human problem solving and mental task processes in a computerized model.
3. A = 0.3/1 + 0.5/2 + 1/3; B = 0.5/1 + 0.55/2 + 1/3, then A is a _____ of B.
4. _____ and _____ operators are used for reshaping the membership functions.
5. IBM Watson is a _____ that combines artificial intelligence (AI) and sophisticated analytical software for optimal performance as a question answering machine.
6. If Fuzzy set A = 0.2/1+0.4/2+1/3+0.6/4, cardinality of set A= _____
7. If the secondary membership function is at its maximum of 1[defined] at every point, we speak of an _____ set.
8. Entropy of Crisp set is _____.
9. Fuzyy set shown below according to degree of membership and shape of the membership function is _____ and _____ respectively.



10. The first paper on fuzzy sets was published by Professor _____ in 1965.
11. Asimov formulated three laws of _____.
12. As of June 2016, the fastest supercomputer in the world is the Sunway TaihuLight, with a Linpack benchmark of 93 PFLOPS, made by the country _____.
13. _____ is a set of algorithms in machine learning, whereby machines figure out which rules to follow based on the data researchers feed them.

Numericals

1. Given U = {1, 2, 3, 4, 5, 6, 7} A = {(3, 0.5), (5, 1), (6, 0.7)} then...

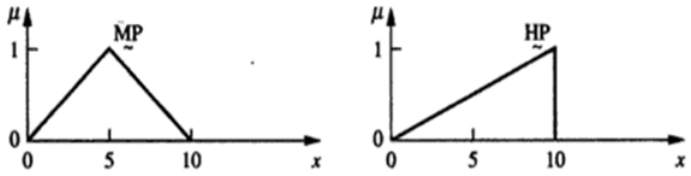
[2 marks]

Solution:

$\tilde{A}$ =

2. The base station controls the power output of the mobile. Medium power(MP) and High power (HP) fuzzy set in power control of mobile cellular phone transmitting to its base station are given below. 'x' is in dBm (power ratio in decibels (dB) of the measured power referenced to one milliwatt (mW)). Draw *properly labeled* diagrams showing intersection of MP & HP, and difference between MP & HP.

[2+2=4 marks]



Solution:

Intersection **Difference**

3. If A = 0.1/a+0.8/b+1/c+0.75/d; B=0.8/a+0.3/b+0.1/c+0.15/d .
Find A U B and A BOLDUNION B.

[2+2=4 marks]

Solution:

A U B =

A BOLDUNION B =

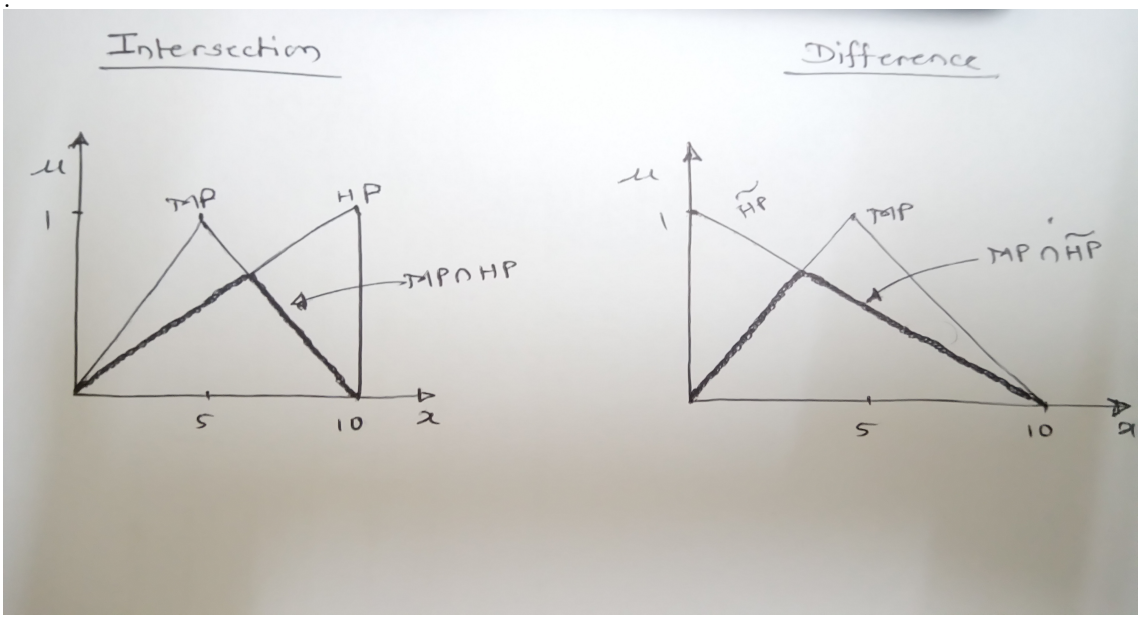
Answer Key for Exam B

Fill in the blanks (1 mark for each blank)

1. Alan Turing.
2. Cognitive.
3. subset.
4. CON, DIL.
5. supercomputer.
6. 2.2.
7. interval type-2.
8. zero.
9. Normal, Non-Convex.
10. Lotfi Zadeh.
11. Robotics.
12. China.
13. deep learning.

Numericals

1. . $\tilde{A} = \{(1, 1), (2, 1), (3, 0.5), (4, 1), (6, 0.3), (7, 1)\}$.
2. .



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3. . A U B = 0.8/a+0.8/b+1/c+0.75/d

   A BOLDUNION B = 0.9/a+1/b+1/c+0.9/d .

Birla Institute of Technology & Science, Pilani (Rajasthan)
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BITS F312 Neural Network & Fuzzy Logic
Quiz 1, Aug 24,2016, Set: C

Duration:25 mins **Max. Marks: 25**

Name: _____ **ID:** | | | | | | | | | | | | |

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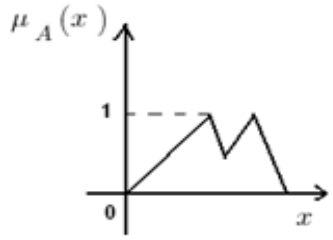
Fill in the blanks (1 mark for each blank)

1. Fuzyy set shown below according to degree of membership and shape of the membership function is _____ and _____ respectively.



2. Asimov formulated three laws of _____.
3. If the secondary membership function is at its maximum of 1[defined] at every point, we speak of an _____ set.
4. A = 0.3/1 + 0.5/2 + 1/3; B = 0.5/1 + 0.55/2 + 1/3, then A is a _____ of B.
5. _____ is a set of algorithms in machine learning, whereby machines figure out which rules to follow based on the data researchers feed them.
6. If Fuzzy set A = 0.2/1+0.4/2+1/3+0.6/4, cardinality of set A= _____
7. _____ modeling is an area of computer science that deals with simulating human problem solving and mental task processes in a computerized model.
8. The first paper on fuzzy sets was published by Professor _____ in 1965.
9. As of June 2016, the fastest supercomputer in the world is the Sunway TaihuLight, with a Linpack benchmark of 93 PFLOPS, made by the country _____.
10. IBM Watson is a _____ that combines artificial intelligence (AI) and sophisticated analytical software for optimal performance as a question answering machine.
11. Entropy of Crisp set is _____.
12. _____ is frequently credited for being the Father of theoretical computer science and artificial intelligence.
13. _____ and _____ operators are used for reshaping the membership functions.

Numericals

1. Given U = {1, 2, 3, 4, 5, 6, 7} A = {(3, 0.3), (5, 1), (6, 0.8)} then...

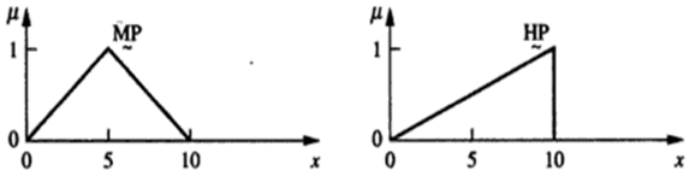
[2 marks]

Solution:

$\tilde{A}$ =

2. The base station controls the power output of the mobile. Medium power(MP) and High power (HP) fuzzy set in power control of mobile cellular phone transmitting to its base station are given below. 'x' is in dBm (power ratio in decibels (dB) of the measured power referenced to one milliwatt (mW)). Draw *properly labeled* diagrams showing intersection of MP & HP, and difference between MP & HP.

[2+2=4 marks]



Solution:

Intersection **Difference**

3. If A = 0.3/a+0.8/b+0/c+0.75/d; B=0.8/a+0.3/b+1/c+0.15/d .
Find A U B and A BOLDUNION B.

[2+2=4 marks]

Solution:

A U B =

A BOLDUNION B =

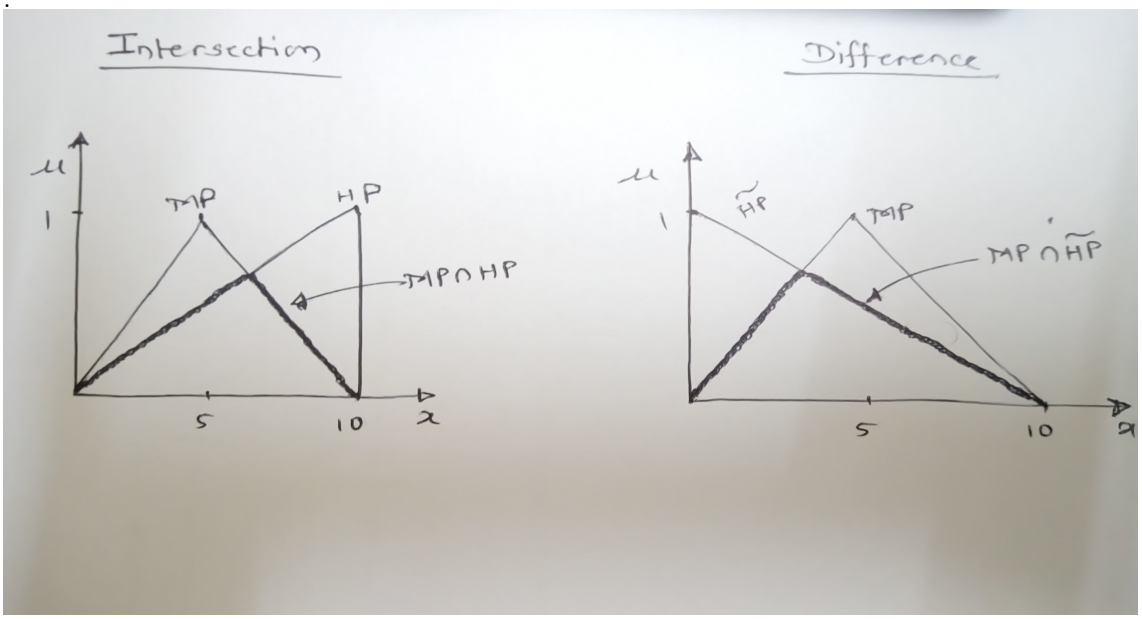
Answer Key for Exam C

Fill in the blanks (1 mark for each blank)

1. Normal, Non-Convex.
2. Robotics.
3. interval type-2.
4. subset.
5. deep learning.
6. 2.2.
7. Cognitive.
8. Lotfi Zadeh.
9. China.
10. supercomputer.
11. zero.
12. Alan Turing.
13. CON, DIL.

Numericals

1. . $\tilde{A} = \{(1, 1), (2, 1), (3, 0.7), (4, 1), (6, 0.2), (7, 1)\}$.
2. .



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3. . A U B = 0.8/a+0.8/b+1/c+0.75/d

   A BOLDUNION B = 1/a+1/b+1/c+0.9/d .

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BITS F312 Neural Network & Fuzzy Logic
Quiz 1, Aug 24,2016, Set: D

Duration:25 mins **Max. Marks: 25**

Name: _____ **ID:** | | | | | | | | | | | | |

Instructions:

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Fill in the blanks (1 mark for each blank)

1. _____ modeling is an area of computer science that deals with simulating human problem solving and mental task processes in a computerized model.
2. A = 0.3/1 + 0.5/2 + 1/3; B = 0.5/1 + 0.55/2 + 1/3, then A is a _____ of B.
3. IBM Watson is a _____ that combines artificial intelligence (AI) and sophisticated analytical software for optimal performance as a question answering machine.
4. The first paper on fuzzy sets was published by Professor _____ in 1965.
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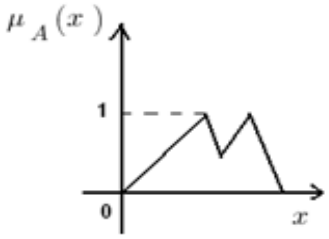


8. If the secondary membership function is at its maximum of 1[defined] at every point, we speak of an _____ set.
9. _____ is a set of algorithms in machine learning, whereby machines figure out which rules to follow based on the data researchers feed them.
10. Entropy of Crisp set is _____.
11. Asimov formulated three laws of _____.
12. As of June 2016, the fastest supercomputer in the world is the Sunway TaihuLight, with a Linpack benchmark of 93 PFLOPS, made by the country _____.
13. If Fuzzy set A = 0.2/1+0.4/2+1/3+0.6/4, cardinality of set A= _____

Numericals

1. Given U = {1, 2, 3, 4, 5, 6, 7} A = {(3, 0.6), (5, 1), (6, 0.4)} then...

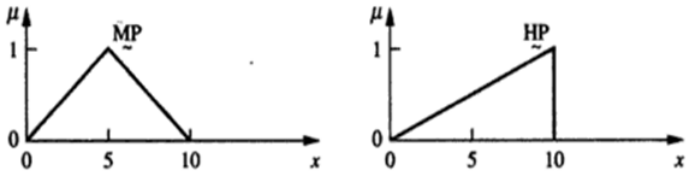
[2 marks]

Solution:

$\tilde{A}$ =

2. The base station controls the power output of the mobile. Medium power(MP) and High power (HP) fuzzy set in power control of mobile cellular phone transmitting to its base station are given below. 'x' is in dBm (power ratio in decibels (dB) of the measured power referenced to one milliwatt (mW)). Draw *properly labeled* diagrams showing intersection of MP & HP, and difference between MP & HP.

[2+2=4 marks]



Solution:

Intersection **Difference**

3. If A = 0.5/a+0.8/b+1/c+0.75/d; B=0.2/a+0.3/b+0/c+0.15/d .
Find A U B and A BOLDUNION B.

[2+2=4 marks]

Solution:

A U B =

A BOLDUNION B =

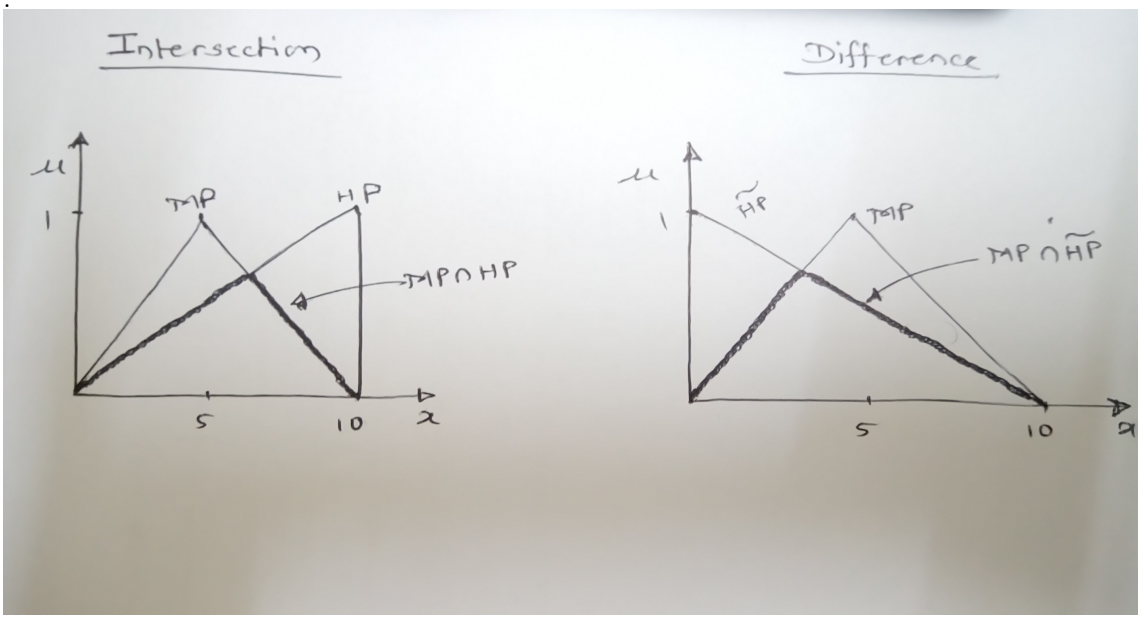
Answer Key for Exam D

Fill in the blanks (1 mark for each blank)

1. Cognitive.
2. subset.
3. supercomputer.
4. Lotfi Zadeh.
5. CON, DIL.
6. Alan Turing.
7. Normal, Non-Convex.
8. interval type-2.
9. deep learning.
10. zero.
11. Robotics.
12. China.
13. 2.2.

Numericals

1. . $\tilde{A} = \{(1, 1), (2, 1), (3, 0.4), (4, 1), (6, 0.6), (7, 1)\}$.
2. .



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3. . A U B = 0.5/a+0.8/b+1/c+0.75/d

   A BOLDUNION B = 0.7/a+1/b+1/c+0.9/d .