

# Unit 4 - Week 2

## Course outline

How does an NPTEL online course work?

### Week 0

### Week 1

### Week 2

**Introduction to Set Theory**

Example, definiton and notation

**Sets - Problems Part 1**

Subsets - Part 1

Subsets - Part 2

Subsets - Part 3

Union and intersections of sets

Union and intersections of sets - Part 1

Union and intersections of sets - Part 2

Union and intersections of sets - Part 3

Cardinality of Union of two sets - Part 1

Cardinality of Union of sets - Part 2

**Cardinality of Union of three sets**

Power Set - Part 1

Power set - Part 2

Power set - Part 3

Connection betwenn Binomial Theorem and Power Sets

Power set - Problems

Complement of a set

De Morgan's Laws - Part 1

De Morgan's Laws - Part 2

A proof technique

De Morgan's Laws - Part 3

De Morgan's Laws - Part 4

Set difference - Part 1

Set difference - Part 2

Symmetric difference

History

**Summary**

Quiz : Assignment 2

Week 2 Feedback

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# Assignment 2

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

**Due on 2020-02-12, 23:59 IST.**

1) Let A and B be two sets such that  $A - B = \{1, 3, 5, 7, 11\}$ ,  $B - A = \{2, 6, 8\}$  and  $A \cap B = \{4, 10\}$ , then the set A is equal to **1 point**

- {2, 4, 6, 8, 10}
- {1, 3, 4, 5, 7, 10, 11}
- {1, 2, 3, 4, 5, 6, 7, 8, 10, 11}
- Can not find A, as the information is insufficient.

No, the answer is incorrect. Score: 0

Accepted Answers: {1, 3, 4, 5, 7, 10, 11}

2) An empty set is denoted by  $\emptyset$ . Consider the following statements **1 point**

$$A : \emptyset \in \emptyset$$

$$B : \emptyset \subseteq \emptyset$$

- A is true, B is true
- A is true, B is false
- A is false, B is true
- A is false, B is false

No, the answer is incorrect. Score: 0

Accepted Answers: A is false, B is true

3) Let A, B be two sets and U be the universal set. Then  $A \cap (A \cup B)^C$  is **1 point**

- A
- U
- $\emptyset$
- $A - B$

No, the answer is incorrect. Score: 0

Accepted Answers:  $\emptyset$

4) Let  $\mathbb{N}$  and  $\mathbb{R}$  denote the set of natural numbers and real numbers respectively. Which of the following is an example of disjoint sets? **1 point**

- $A = \{x|x \in \mathbb{N} \text{ and } x \text{ is a multiple of } 5\}$  and  $B = \{x|x \in \mathbb{N} \text{ and } x \text{ is a multiples of } 7\}$
- Set of natural numbers  $\mathbb{N}$  and set of real numbers  $\mathbb{R}$
- $S = \{\text{People having birth month January}\}$  and  $P = \{\text{People having birth year } 1994\}$
- $M = \{x|x \in \mathbb{N} \text{ and } x \text{ is an Odd number}\}$  and  $N = \{x|x \in \mathbb{N} \text{ and } x \text{ is an even number}\}$

No, the answer is incorrect. Score: 0

Accepted Answers:  $M = \{x|x \in \mathbb{N} \text{ and } x \text{ is an Odd number}\}$  and  $N = \{x|x \in \mathbb{N} \text{ and } x \text{ is an even number}\}$

5) Let A and B be two sets such that  $|A| = 10$ ,  $|B| = 8$ ,  $|A \cup B| = 14$ , then  $|A \Delta B|$  is **1 point**

- 18
- 6
- 10
- 4

No, the answer is incorrect. Score: 0

Accepted Answers: 10

6) Number of elements in set  $S = \{1 + (-1)^n | n \in \mathbb{N}\}$  is/are **1 point**

- 1
- 2
- $\infty$  (Infinite elements)
- 0

No, the answer is incorrect. Score: 0

Accepted Answers: 2

7) Let  $A = \{1, \{1\}, \{2\}\}$ , then which of the following is an element of power set of A? **1 point**

- 1
- {2}
- {1}
- {1, 2}

No, the answer is incorrect. Score: 0

Accepted Answers: {1}

8) Let  $U = \{1, 2, 3, 4, a, b, c\}$  be the universal set and  $L = \{2, 4, a, c\}$  be subset of  $U$ . Then,  $L^C$  is **1 point**

- {1, 3, 4, b}
- {1, 3, b}
- {1, 3, a, b}
- {1, 3, b, c}

No, the answer is incorrect. Score: 0

Accepted Answers: {1, 3, b}

9) Each student in a class of 100 plays at least one sport Football, Cricket or Tennis. 40 play Football and 30 play Tennis. 15 play Football and Cricket, 10 play Cricket and Tennis and 8 play Football and Tennis. 3 students play all 3 sports. Find the number of students who play Cricket. **1 point**

- 60
- 40
- 50
- 45

No, the answer is incorrect. Score: 0

Accepted Answers: 60

10) State if the following statement is true or false. **1 point**

$$(A \cup B) - (A \cap B) = (A - B) \cup (B - A)$$

- True
- False

No, the answer is incorrect. Score: 0

Accepted Answers: True