

Unit 6 - Week 4

Course outline

How does an NPTEL online course work?

Week 0

Week 1

Week 2

Week 3

Week 4

- Introduction to Relation
- Graphical Representation of a Relation
- Various sets
- Matrix Representation of a Relation
- Relation - An Example
- Cartesian Product
- Set Representation of a Relation
- Revisiting Representations of a Relation
- Examples of Relations
- Number of relations - Part 1
- Number of relations - Part 2
- Reflexive relation - Introduction
- Example of a Reflexive relation
- Reflexive relation - Matrix representation
- Number of Reflexive relations
- Symmetric Relation - Introduction
- Symmetric Relation - Matrix representation
- Symmetric Relation - Examples and non examples
- Parallel lines revisited
- Number of symmetric relations - Part 1
- Number of symmetric relations - Part 2
- Examples of Reflexive and Symmetric Relations
- Pattern
- Transitive relation - Examples and non examples
- Antisymmetric relation
- Examples of Transitive and Antisymmetric Relation
- Antisymmetric - Graphical representation
- Antisymmetric - Matrix representation
- Number of Antisymmetric relations
- Condition for relation to be reflexive
- Few notations
- Condition for relation to be reflexive
- Condition for relation to be reflexive
- Condition for relation to be symmetric
- Condition for relation to be symmetric
- Condition for relation to be antisymmetric
- Equivalence relation
- Equivalence relation - Example 4
- Partition - Part 1
- Partition - Part 2
- Partition - Part 3
- Partition - Part 4
- Partition - Part 5
- Partition - Part 5
- Quiz : Assignment 4
- Week 4 Feedback

Week 5

Week 6

Week 7

Week 8

Week 9

Week 10

Week 11

Week 12

Text Transcripts

Download Videos

Assignment 4

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

Due on 2020-02-26, 23:59 IST.

1) Let A be a set with cardinality n . There are total 1024 symmetric relations on A . Then value of n is 1 point

- 3
- 6
- 10
- 4

No, the answer is incorrect.
Score: 0

Accepted Answers:
4

2) The empty relation on set $X = \{a, b, c\}$ is: 1 point

- Neither reflexive nor symmetric
- Symmetric and reflexive
- Transitive and reflexive
- Transitive and symmetric

No, the answer is incorrect.
Score: 0

Accepted Answers:
Transitive and symmetric

3) Let A be a set with n elements. Let $a, b \in A$, be two distinct elements. Then the total number of relations on A that contain (a, b) is 1 point

- $2^{n^2} - 1$
- 2^{n-1}
- 2^{n^2-n}
- 2^{n^2-1}

No, the answer is incorrect.
Score: 0

Accepted Answers:
 2^{n^2-1}

4) Let \mathcal{R} be a relation on natural numbers defined as $\mathcal{R} = \{(n, n^2) | n \in \mathbb{N}\}$. Then \mathcal{R} is 1 point

- Reflexive
- Transitive
- Equivalence relation
- Anti-symmetric

No, the answer is incorrect.
Score: 0

Accepted Answers:
Anti-symmetric

5) Let A and B be two sets such that $|A| = m$ and $|B| = n$. The number of elements in power set of $A \times B$ is 1 point

- 2^{m+n}
- 2^{mn}
- 2^{m^n}
- 2^n

No, the answer is incorrect.
Score: 0

Accepted Answers:
 2^{mn}

6) Let \mathcal{R} be a relation on a set A with n elements. \mathcal{R} is reflexive implies 1 point

- If $(a, b) \in \mathcal{R}$, then $(b, a) \in \mathcal{R}$
- $(a, a) \in \mathcal{R}, \forall a \in A$
- If $(a, b) \in \mathcal{R}$, then $(b, a) \notin \mathcal{R}$.
- $(a, a) \in \mathcal{R}$, for some $a \in A$

No, the answer is incorrect.
Score: 0

Accepted Answers:
 $(a, a) \in \mathcal{R}, \forall a \in A$

7) Let S be a set having n elements. How many relations on S are both reflexive and symmetric? 1 point

- $2^{\frac{n(n-1)}{2}}$
- 2^{n^2-n}
- $2^{\frac{n(n+1)}{2}}$
- 2^{n^2-1}

No, the answer is incorrect.
Score: 0

Accepted Answers:
 $2^{\frac{n(n-1)}{2}}$

8) Which of the following is NOT a relation from $M = \{a, b, c\}$ to $N = \{1, 10, 100\}$ 1 point

- $\{\}$
- $\{(a, 1), (a, 10), (a, 100)\}$
- $\{(a, 10), (1, b), (c, 100)\}$
- $\{(c, 10), (b, 100)\}$

No, the answer is incorrect.
Score: 0

Accepted Answers:
 $\{(a, 10), (1, b), (c, 100)\}$

9) Let M be a matrix of relation \mathcal{R} and M^T is transpose of the matrix M . Then $M = M^T$ is a condition for relation to be anti-symmetric. 1 point

- True
- False

No, the answer is incorrect.
Score: 0

Accepted Answers:
False

10) Which of the following collection of subsets is a partition of $S = \{a, b, c, d\}$? 1 point

- $\{a, d\}, \{b, c, d\}$
- $\{a\}, \{b\}, \{c\}, \{d\}$
- $\{a, b, d\}$
- $\{b, d\}, \{a, c\}, \{b\}$

No, the answer is incorrect.
Score: 0

Accepted Answers:
 $\{a\}, \{b\}, \{c\}, \{d\}$