Appendices

Appendix I

$X = \{a, b, c\}$

1. $\boldsymbol{\tau} = \{\boldsymbol{X}, \emptyset, \{\boldsymbol{a}\}\}$ **Closed sets are** $\{X, \emptyset, \{b, c\}\}$

$\boldsymbol{\delta P_S}$**-open sets**	$\boldsymbol{\delta P_S}$**-closed sets**
$X, \emptyset, \{b\}, \{c\}, \{b, c\}$	$X, \emptyset, \{a\}, \{a, b\}, \{a, c\}$
$\boldsymbol{\delta}$**-open sets**	$\boldsymbol{\delta}$**-closed sets**
$X, \emptyset$	$X, \emptyset$
Semi-open sets	**Semi-closed sets**
$X, \emptyset, \{a\}, \{a, b\}, \{a, c\}$	$X, \emptyset, \{b\}, \{c\}, \{b, c\}$
Pre-open sets	**Pre-closed sets**
$X, \emptyset, \{a\}, \{a, b\}, \{a, c\}$	$X, \emptyset, \{b\}, \{c\}, \{b, c\}$
$\boldsymbol{\delta}$**-preopen sets**	$\boldsymbol{\delta}$**-preclosed sets**
$P(X)$	$P(X)$
Regular open sets	**Regular closed sets**
$X, \emptyset$	$X, \emptyset$
$\boldsymbol{P_S}$**- open sets**	$\boldsymbol{P_S}$**- closed sets**
$X, \emptyset$	$X, \emptyset$

$X = \{a, b, c\}$

2. $\boldsymbol{\tau} = \{\boldsymbol{X}, \emptyset, \{\boldsymbol{a}\}, \{\boldsymbol{a}, \boldsymbol{b}\}\}$ **Closed sets are** $\{X, \emptyset, \{c\}, \{b, c\}\}$

$\boldsymbol{\delta P_S}$**-open sets**	$\boldsymbol{\delta P_S}$**-closed sets**
$X, \emptyset, \{b\}, \{c\}, \{b, c\}$	$X, \emptyset, \{a\}, \{a, b\}, \{a, c\}$
$\boldsymbol{\delta}$**-open sets**	$\boldsymbol{\delta}$**-closed sets**
$X, \emptyset$	$X, \emptyset$
Semi-open sets	**Semi-closed sets**
$X, \emptyset, \{a\}, \{a, b\}, \{a, c\}$	$X, \emptyset, \{b\}, \{c\}, \{b, c\}$
Pre-open sets	**Pre-closed sets**
$X, \emptyset, \{a\}, \{b\}, \{a, c\}$	$X, \emptyset, \{b\}, \{b, c\}, \{a, c\}$
$\boldsymbol{\delta}$**-preopen sets**	$\boldsymbol{\delta}$**-preclosed sets**
$P(X)$	$P(X)$
Regular open sets	**Regular closed sets**

$X, \emptyset$	$X, \emptyset$
$\boldsymbol{P_S}$**- open sets** $X, \emptyset$	$\boldsymbol{P_S}$**- closed sets** $X, \emptyset$

$X = \{a, b, c\}$

3. $\boldsymbol{\tau} = \{\boldsymbol{X}, \emptyset, \{\boldsymbol{a}, \boldsymbol{b}\}\}$ **Closed sets are** $\{X, \emptyset, \{c\}\}$

$\boldsymbol{\delta P_S}$**-open sets** $X, \emptyset, \{c\}$	$\boldsymbol{\delta P_S}$**-closed sets** $X, \emptyset, \{a, b\}$
$\boldsymbol{\delta}$**-open sets** $X, \emptyset$	$\boldsymbol{\delta}$**-closed sets** $X, \emptyset$
Semi-open sets $X, \emptyset, \{a, b\}$	**Semi-closed sets** $X, \emptyset, \{c\}$
Pre-open sets $X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, c\}, \{b, c\}$	**Pre-closed sets** $X, \emptyset, \{a\}, \{b\}, \{c\}, \{b, c\}, \{a, c\}$
$\boldsymbol{\delta}$**-preopen sets** $P(X)$	$\boldsymbol{\delta}$**-preclosed sets** $P(X)$
Regular open sets $X, \emptyset$	**Regular closed sets** $X, \emptyset$
$\boldsymbol{P_S}$**- open sets** $X, \emptyset$	$\boldsymbol{P_S}$**- closed sets** $X, \emptyset$

$X = \{a, b, c\}$

4. $\boldsymbol{\tau} = \{\boldsymbol{X}, \emptyset, \{\boldsymbol{a}\}, \{\boldsymbol{b}\}, \{\boldsymbol{a}, \boldsymbol{b}\}\}$ **Closed sets are** $\{X, \emptyset, \{c\}, \{a, c\}, \{b, c\}\}$

$\boldsymbol{\delta P_S}$**-open sets** $X, \emptyset, \{a\}, \{b\}, \{a, b\}$	$\boldsymbol{\delta P_S}$**-closed sets** $X, \emptyset, \{c\}, \{a, c\}, \{b, c\}$
$\boldsymbol{\delta}$**-open sets** $X, \emptyset, \{a\}, \{b\}, \{a, b\}$	$\boldsymbol{\delta}$**-closed sets** $X, \emptyset, \{c\}, \{a, c\}, \{b, c\}$
Semi-open sets $X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, c\}, \{b, c\}$	**Semi-closed sets** $X, \emptyset, \{a\}, \{b\}, \{c\}, \{a, c\}, \{b, c\}$
Pre-open sets	**Pre-closed sets**

$X, \emptyset, \{a\}, \{b\}, \{a, b\}$	$X, \emptyset, \{c\}, \{a, c\}, \{b, c\}$
δ-preopen sets $X, \emptyset, \{a\}, \{b\}, \{a, b\}$	**δ-preclosed sets** $X, \emptyset, \{c\}, \{a, c\}, \{b, c\}$
Regular open sets $X, \emptyset$	**Regular closed sets** $X, \emptyset$
P_S- open sets $X, \emptyset, \{a\}, \{b\}, \{a, b\}$	**P_S- closed sets** $X, \emptyset, \{c\}, \{a, c\}, \{b, c\}$

$X = \{a, b, c\}$

5. $\tau = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, c\}\}$ **Closed sets are** $\{X, \emptyset, \{b\}, \{c\}, \{a, c\}, \{b, c\}\}$

δP_S-open sets $X, \emptyset, \{b\}, \{c\}, \{b, c\}, \{a, c\}$	**δP_S-closed sets** $X, \emptyset, \{c\}, \{a, c\}, \{b, c\}$
δ-open sets $X, \emptyset, \{b\}, \{a, c\}$	**δ-closed sets** $X, \emptyset, \{b\}, \{a, c\}$
Semi-open sets $X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, c\}$	**Semi-closed sets** $X, \emptyset, \{b\}, \{c\}, \{a, c\}, \{b, c\}$
Pre-open sets $X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, c\}$	**Pre-closed sets** $X, \emptyset, \{b\}, \{c\}, \{a, c\}, \{b, c\}$
δ-preopen sets $P(X)$	**δ-preclosed sets** $P(X)$
Regular open sets $X, \emptyset$	**Regular closed sets** $X, \emptyset$
P_S- open sets $X, \emptyset, \{b\}, \{a, c\}$	**P_S- closed sets** $X, \emptyset, \{b\}, \{a, c\}$

$X = \{a, b, c\}$

6. $\tau = \{X, \emptyset, \{a\}, \{a, b\}, \{a, c\}\}$ **Closed sets are** $\{X, \emptyset, \{b\}, \{c\}, \{b, c\}\}$

δP_S-open sets $X, \emptyset, \{b\}, \{c\}, \{b, c\}$	**δP_S-closed sets** $X, \emptyset, \{a\}, \{a, c\}, \{a, b\}$
δ-open sets $X, \emptyset$	**δ-closed sets** $X, \emptyset$
Semi-open sets	**Semi-closed sets**

$X, \emptyset, \{a\}, \{b\}, \{a, c\}$	$X, \emptyset, \{b\}, \{a, c\}, \{b, c\}$
Pre-open sets $X, \emptyset, \{a\}, \{a, b\}, \{a, c\}$	**Pre-closed sets** $X, \emptyset, \{b\}, \{c\}, \{b, c\}$
δ-preopen sets $P(X)$	**δ-preclosed sets** $P(X)$
Regular open sets $X, \emptyset$	**Regular closed sets** $X, \emptyset$
P_S- open sets $X, \emptyset$	**P_S- closed sets** $X, \emptyset$

$X = \{a, b, c\}$ **7.** $\tau = \{X, \emptyset, \{a\}, \{b, c\}\}$	**Closed sets are** $\{X, \emptyset, \{a\}, \{b, c\}\}$
δP_S-open sets $X, \emptyset, \{a\}, \{b, c\}$	**δP_S-closed sets** $X, \emptyset, \{a\}, \{b, c\}$
δ-open sets $X, \emptyset, \{b\}, \{a, c\}$	**δ-closed sets** $X, \emptyset, \{b\}, \{a, c\}$
Semi-open sets $X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, c\}$	**Semi-closed sets** $X, \emptyset, \{b\}, \{c\}, \{a, c\}, \{b, c\}$
Pre-open sets $X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, c\}$	**Pre-closed sets** $X, \emptyset, \{b\}, \{c\}, \{a, c\}, \{b, c\}$
δ-preopen sets $P(X)$	**δ-preclosed sets** $P(X)$
Regular open sets $X, \emptyset, \{a\}, \{b, c\}$	**Regular closed sets** $X, \emptyset, \{a\}, \{b, c\}$
P_S- open sets $X, \emptyset, \{a\}, \{b, c\}$	**P_S- closed sets** $X, \emptyset, \{a\}, \{b, c\}$

Appendix II

$X = \{a, b, c, d\}$

1. $\boldsymbol{\tau} = \{\boldsymbol{X}, \emptyset, \{\boldsymbol{a}\}\}$ **Closed sets are** $\{X, \emptyset, \{b, c, d\}\}$

$\boldsymbol{\delta P_S}$**-open sets**	$\boldsymbol{\delta P_S}$**-closed sets**
$X, \emptyset, \{b\}, \{c\}, \{d\}, \{b, c\}, \{b, d\}, \{c, d\}, \{b, c, d\}\}$	$X, \emptyset, \{a\}, \{a, b\}, \{a, c\}, \{a, d\}, \{a, c, d\}, \{a, b, d\}$
$\boldsymbol{\delta}$**-open sets** $X, \emptyset$	$\boldsymbol{\delta}$**-closed sets** $X, \emptyset$
Semi-open sets $X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, c\}$	**Semi-closed sets** $X, \emptyset, \{b\}, \{c\}, \{a, c\}, \{b, c\}$
Pre-open sets $X, \emptyset, \{a\}, \{a, b\}, \{a, c\}, \{a, d\}, \{a, b, c\}, \{a, b, d\}, \{a, c, d\}$	**Pre-closed sets** $X, \emptyset, \{b\}, \{c\}, \{d\}, \{b, c\}, \{c, d\}, \{b, d\}, \{b, c, d\}$
$\boldsymbol{\delta}$**-preopen sets** $P(X)$	$\boldsymbol{\delta}$**-preclosed sets** $P(X)$
Regular open sets $X, \emptyset$	**Regular closed sets** $X, \emptyset$
$\boldsymbol{P_S}$**- open sets** $X, \emptyset$	$\boldsymbol{P_S}$**- closed sets** $X, \emptyset$

$X = \{a, b, c, d\}$

2. $\boldsymbol{\tau} = \{\boldsymbol{X}, \emptyset, \{\boldsymbol{a}, \boldsymbol{b}\}\}$ **Closed sets are** $\{X, \emptyset, \{c, d\}\}$

$\boldsymbol{\delta P_S}$**-open sets**	$\boldsymbol{\delta P_S}$**-closed sets**
$X, \emptyset, \{c\}, \{d\}, \{c, d\}$	$X, \emptyset, \{a, b\}, \{a, b, c\}, \{a, b, d\}$
$\boldsymbol{\delta}$**-open sets** $X, \emptyset$	$\boldsymbol{\delta}$**-closed sets** $X, \emptyset$
Semi-open sets $X, \emptyset, \{a, b\}, \{a, b, c\}, \{a, b, d\}$	**Semi-closed sets** $X, \emptyset, \{c\}, \{d\}, \{c, d\}$
Pre-open sets $X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, c\}, \{a, d\}, \{b, c\}, \{b, d\}, \{a, b, c\}, \{a, b, d\}, \{a, c, d\}, \{b, c, d\}$	**Pre-closed sets** $X, \emptyset, \{a\}, \{b\}, \{c\}, \{d\}, \{a. c\}, \{a, d\}, \{b, c\}$ $\{b, d\}. \{c, d\}, \{a, c, d\}, \{b, c, d\}$
$\boldsymbol{\delta}$**-preopen sets**	$\boldsymbol{\delta}$**-preclosed sets**

$P(X)$	$P(X)$
Regular open sets $X, \emptyset$	**Regular closed sets** $X, \emptyset$
P_S- open sets $X, \emptyset$	**P_S- closed sets** $X, \emptyset$

$X = \{a, b, c, d\}$

3. $\boldsymbol{\tau = \{X, \emptyset, \{a, b, c\}\}}$ **Closed sets are** $\{X, \emptyset, \{d\}\}$

δP_S-open sets $X, \emptyset, \{d\}$	**δP_S-closed sets** $X, \emptyset, \{a, b, c\}$
δ-open sets $X, \emptyset$	**δ-closed sets** $X, \emptyset$
Semi-open sets $X, \emptyset, \{a, b, c\}$	**Semi-closed sets** $X, \emptyset, \{d\}$
Pre-open sets $X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, c\}, \{a, d\}, \{b, c\}, \{b, d\}, \{a, b, c\}, \{a, b, d\}, \{a, c, d\}, \{b, c, d\}$	**Pre-closed sets** $X, \emptyset, \{a\}, \{b\}, \{c\}, \{d\}, \{a.c\}, \{a, d\}, \{b, \{b, d\}.\{c, d\}, \{a, c, d\}, \{b, c, d\}$
δ-preopen sets $P(X)$	**δ-preclosed sets** $P(X)$
Regular open sets $X, \emptyset$	**Regular closed sets** $X, \emptyset$
P_S- open sets $X, \emptyset$	**P_S- closed sets** $X, \emptyset$

$X = \{a, b, c, d\}$

4. $\boldsymbol{\tau = \{X, \emptyset, \{a\}, \{a, b\}\}}$ **Closed sets are** $\{X, \emptyset, \{c, d\}, \{b, c, d\}\}$

δP_S-open sets $X, \emptyset, \{b\}, \{c\}, \{d\}, \{b, c\}, \{b, d\}, \{c, d\}, \{b, c, d\}$	**δP_S-closed sets** $X, \emptyset, \{a\}, \{a, b\}, \{a, c\}, \{a, d\}, \{a, b, c\}, \{a, b, d\}, \{a, c, d\}$
δ-open sets $X, \emptyset$	**δ-closed sets** $X, \emptyset$
Semi-open sets	**Semi-closed sets**

$X, \emptyset, \{a, b\}, \{a, b, c\}, \{a, b, d\}$	$X, \emptyset, \{b\}, \{c\}, \{d\}, [b, c\}, \{b, d\}, \{c, d\}, \{b, c, d\}$
Pre-open sets $X, \emptyset, \{a\}, \{a, b\}, \{a, c\}, \{a, d\}, \{a, b, c\}, \{a, b, d\}, \{a, c, d\}$	**Pre-closed sets** $X, \emptyset, \{b\}, \{c\}, \{d\}, \{b, c\}, \{b, d\}. \{c, d\}, \{b, c, d\}$
δ-preopen sets $P(X)$	**δ-preclosed sets** $P(X)$
Regular open sets $X, \emptyset$	**Regular closed sets** $X, \emptyset$
P_S- open sets $X, \emptyset$	**P_S- closed sets** $X, \emptyset$

$X = \{a, b, c, d\}$

5. $\boldsymbol{\tau = \{X, \emptyset, \{a\}, \{c\}, \{a, b\}, \{a, c\}, \{a, b, c\}, \{a, c, d\}\}}$
Closed sets are $\{X, \emptyset, \{b\}, \{d\}, \{c, d\}, \{b, d\}, \{b, c, d\}, \{a, b, d\}\}$

δP_S-open sets $X, \emptyset, \{c\}, \{b, c\}, \{a, b, c\}, \{b, c, d\}$	**δP_S-closed sets** $X, \emptyset, \{a\}, \{d\}, \{a, d\}, \{a, b, d\}$
δ-open sets $X, \emptyset, \{c\}, \{a, b\}, \{a, c, d\}$	**δ-closed sets** $X, \emptyset, \{d\}, \{c, d\}, \{a, b, d\}$
Semi-open sets $X, \emptyset, \{a\}, \{c\}, \{a, b\}, \{a, c\}, \{a, d\}, \{c, d\}, \{a, c, d\}, \{a, b, d\}, \{a, b, c\}$	**Semi-closed sets** $X, \emptyset, \{b\}, \{c\}, \{d\}, \{a, b\}, \{b, c\}, \{b, d\}, \{c, d\}, \{a, b, d\}, \{b, c, d\}$
Pre-open sets $X, \emptyset, \{a\}, \{c\}, \{a, b\}, \{a, c\}, \{a, b, c\}, \{a, c, d\}$	**Pre-closed sets** $X, \emptyset, \{b\}, \{d\}, \{b, d\}, \{c, d\}, \{a, b, d\}, \{b, c, d\}$
δ-preopen sets $X, \emptyset, \{a\}, \{c\}, \{a, c\}, \{b, c\}, \{a, b, c\}, \{b, c, d\}, \{a, c, d\}$	**δ-preclosed sets** $X, \emptyset, \{a\}, \{b\}, \{d\}, \{a, d\}, \{b, d\}, \{a, b, d\}, \{b, c, d\}$
Regular open sets $X, \emptyset, \{c\}, \{a, b\}$	**Regular closed sets** $X, \emptyset, \{c\}, \{a, b\}$
P_S- open sets $X, \emptyset, \{c\}, \{a, b\}, \{a, c\}, \{a, b, c\}, \{a, c, d\}$	**P_S- closed sets** $X, \emptyset, \{b\}, \{d\}, \{b, d\}, \{c, d\}, \{a, b, d\}$

$X = \{a, b, c, d\}$

6. $\boldsymbol{\tau = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}}$

Closed sets are $\{X, \emptyset, \{c\}, \{d\}, \{c, d\}, \{b, c, d\}, \{a, c, d\}\}$

δP_S**-open sets**	δP_S**-closed sets**
$X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}$	$X, \emptyset, \{c\}, \{d\}, \{c, d\}, \{a, c, d\}, \{b, c, d\}$
δ**-open sets**	δ**-closed sets**
$X, \emptyset, \{a\}, \{b\}, \{a, b\}$	$X, \emptyset, \{c, d\}, \{a, c, d\}, \{b, c, d\}$
Semi-open sets	**Semi-closed sets**
$X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, c\}, \{a, d\}, \{b, c\}, \{b, d\}, \{a, b, c\}, \{a, b, d\}, \{a, c, d\}, \{b, c, d\}$	$X, \emptyset, \{a\}, \{b\}, \{c\}, \{d\}, \{a, c\}, \{a, d\}, \{b, c\} \{b, d\}, \{c, d\}, \{a, c, d\}, \{b, c, d\}$
Pre-open sets	**Pre-closed sets**
$X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}$	$X, \emptyset, \{c\}, \{d\}, \{c, d\}, \{a, c, d\}, \{b, c, d\}$
δ**-preopen sets**	δ**-preclosed sets**
$X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}$	$X, \emptyset, \{c\}, \{d\}, \{c, d\}, \{a, c, d\}, \{b, c, d\}$
Regular open sets	**Regular closed sets**
$X, \emptyset, \{a\}, \{b\}$	$X, \emptyset, \{a, c, d\}, \{b, c, d\}$
P_S**- open sets**	P_S**- closed sets**
$X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}$	$X, \emptyset, \{c\}, \{d\}, \{c, d\}, \{a, c, d\}, \{b, c, d\}$

$X = \{a, b, c, d\}$

7. $\boldsymbol{\tau = \{X, \emptyset, \{c\}, \{a, b\}, \{a, b, c\}\}}$

Closed sets are $\{X, \emptyset, \{d\}, \{c, d\}, \{a, c, d\}\}$

δP_S**-open sets**	δP_S**-closed sets**
$X, \emptyset, \{c\}, \{a, b\}, \{a, b, c\}$	$X, \emptyset, \{d\}, \{c, d\}, \{a, b, d\}$
δ**-open sets**	δ**-closed sets**
$X, \emptyset, \{c\}, \{a, b\}, \{a, b, c\}$	$X, \emptyset, \{d\}, \{c, d\}, \{a, b, d\}$
Semi-open sets	**Semi-closed sets**
$X, \emptyset, \{c\}, \{a, b\}, \{c, d\}, \{a, b, c\}, \{a, b, d\}$	$X, \emptyset, \{c\}, \{d\}, \{a, b\}, \{c, d\}, \{a, b, d\}$
Pre-open sets	**Pre-closed sets**
$X, \emptyset, \{a\}, \{b\}, \{c\}, \{a, b, c\}, \{a, c, d\}, \{b, c, d\}$	$X, \emptyset, \{a\}, \{b\}, \{d\}, \{a, b, d\}, \{a, c, d\}, \{b, c,$
δ**-preopen sets**	δ**-preclosed sets**

$X, \emptyset, \{a\}, \{b\}, \{c\}, \{a, b\}, \{a, c\}, \{b, c\}, \{a, b, c\}, \{a, c, d\}, \{b, c, d\}$	$X, \emptyset, \{a\}, \{b\}, \{d\}, \{a, d\}, \{b, d\}, \{c, d\}, \{a, b, d\}, \{a, c, d\}, \{b, c, d\}$
Regular open sets $X, \emptyset, \{c\}, \{a, b\}$	**Regular closed sets** $X, \emptyset, \{c, d\}, \{b, c, d\}$
P_S- open sets $X, \emptyset, \{c\}, \{a, b\}, \{a, b, c\}, \{a, c, d\}, \{b, c, d\}$	**P_S- closed sets** $X, \emptyset, \{a\}, \{b\}, \{d\}, \{c, d\}, \{a, b, d\}$

$X = \{a, b, c, d\}$

8. $\boldsymbol{\tau = \{X, \emptyset, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}}$

Closed sets are $\{X, \emptyset, \{c\}, \{d\}, \{c, d\}\}$

δP_S-open sets $X, \emptyset, \{c\}, \{d\}, \{c, d\}$	**δP_S-closed sets** $X, \emptyset, \{a, b\}, \{a, b, c\}, \{a, b, d\}$
δ-open sets $X, \emptyset$	**δ-closed sets** $X, \emptyset$
Semi-open sets $X, \emptyset, \{a, b\}, \{a, b, c\}, \{a, b, d\}$	**Semi-closed sets** $X, \emptyset, \{c\}, \{d\}, \{c, d\}$
Pre-open sets $X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, c\}, \{a, d\}, \{b, c\}, \{b, d$ $\{a, b, c\}, \{a, b, d\}, \{a, c, d\}, \{b, c, d\}$	**Pre-closed sets** $X, \emptyset, \{a\}, \{b\}, \{c\}, \{d\}, \{a, c\}, \{a, d\}, \{b, c$ $\{b, d\}, \{c, d\}\{a, c, d\}, \{b, c, d\}$
δ-preopen sets $P(X)$	**δ-preclosed sets** $P(X)$
Regular open sets $X, \emptyset$	**Regular closed sets** $X, \emptyset$
P_S- open sets $X, \emptyset$	**P_S- closed sets** $X, \emptyset$

$X = \{a, b, c, d\}$

9. $\boldsymbol{\tau = \{X, \emptyset, \{a\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}}$

Closed sets are $\{X, \emptyset, \{c\}, \{d\}, \{c, d\}, \{b, c, d\}\}$

δP_S-open sets $X, \emptyset, \{b\}, \{c\}, \{d\}, \{b, c\}, \{b, d\}, \{c, d\}, \{b, c,$	**δP_S-closed sets** $X, \emptyset, \{a\}, \{a, b\}, \{a, c\}, \{a, d\}, \{a, b, c\},$

	$\{a,b,d\},\{a,c,d\}$
δ-open sets $X,\emptyset$	**δ-closed sets** $X,\emptyset$
Semi-open sets $X,\emptyset,\{a\},\{a,b\},\{a,c\},\{a,d\},\{a,b,d\},\{a,b$	**Semi-closed sets** $X,\emptyset,\{b\},\{c\},\{d\},\{b,c\},\{b,d\},\{c,d\},\{b,c$
Pre-open sets $X,\emptyset,\{a\},\{a,b\},\{a,c\},\{a,d\},$ $\{a,b,c\},\{a,b,d\},\{a,c,d\}$	**Pre-closed sets** $X,\emptyset,\{b\},\{c\},\{d\},\{b,c\},$ $\{b,d\},\{c,d\},\{b,c,d\}$
δ-preopen sets $P(X)$	**δ-preclosed sets** $P(X)$
Regular open sets $X,\emptyset$	**Regular closed sets** $X,\emptyset$
P_S- open sets $X,\emptyset$	**P_S- closed sets** $X,\emptyset$

$X=\{a,b,c,d\}$

10. $\boldsymbol{\tau=\{X,\emptyset,\{a\},\{b\},\{a,b\}\}}$

Closed sets are $\{X,\emptyset,\{c,d\},\{a,c,d\},\{b,c,d\}\}$

δP_S-open sets $X,\emptyset,\{a\},\{b\},\{a,b\},\{a,b,c\},\{a,b,d\}$	**δP_S-closed sets** $X,\emptyset,\{c\},\{d\},\{c,d\},\{b,c,d\},\{a,c,d\}$
δ-open sets $X,\emptyset,\{c,d\},\{a,c,d\},\{b,c,d\}$	**δ-closed sets** $X,\emptyset,\{a\},\{b\},\{a,b\}$
Semi-open sets $X,\emptyset,\{a\},\{b\},\{a,b\},\{a,c\},\{a,d\},\{b,c\},\{b,d\}$ $\{a,b,d\},\{a,b,c\},\{a,c,d\},\{b,c,d\}$	**Semi-closed sets** $X,\emptyset,\{a\},\{b\},\{c\},\{d\},\{a,c\},\{a,d\},\{b,$ $\{b,d\},\{c,d\},\{a,c,d\},\{b,c,d\}$
Pre-open sets $X,\emptyset,\{a\},\{b\},\{a,b\},\{a,b,c\},\{a,b,d\}$	**Pre-closed sets** $X,\emptyset,\{c\},\{d\},\{c,d\},\{a,c,d\},\{b,c,d\}$
δ-preopen sets $X,\emptyset,\{a\},\{b\},\{a,b\},\{a,b,c\},\{a,b,d\}$	**δ-preclosed sets** $X,\emptyset,\{c\},\{d\},\{c,d\},\{a,c,d\},\{b,c,d\}$
Regular open sets $X,\emptyset,\{a\},\{b\}$	**Regular closed sets** $X,\emptyset,\{a,c,d\},\{b,c,d\}$
P_S- open sets	**P_S- closed sets**

$X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}$	$X, \emptyset, \{c\}, \{d\}, \{c, d\}, \{a, c, d\}, \{b, c, d\}$

$X = \{a, b, c, d\}$

11. $\boldsymbol{\tau = \{X, \emptyset, \{a\}, \{b, c\}, \{a, b, c\}\}}$

Closed sets are $\{X, \emptyset, \{d\}, \{a, d\}, \{b, c, d\}\}$

δP_S**-open sets**	δP_S**-closed sets**
$X, \emptyset, \{a\}, \{b, c\}, \{a, b, c\}$	$X, \emptyset, \{d\}, \{a, d\}, \{b, c, d\}$
δ**-open sets**	δ**-closed sets**
$X, \emptyset, \{d\}, \{b, c\}, \{a, b, c\}$	$X, \emptyset, \{d\}, \{a, d\}, \{a, b, c\}$
Semi-open sets	**Semi-closed sets**
$X, \emptyset, \{a\}, \{a, d\}, \{b, c\}, \{a, b, c\}, \{b, c, d\}$	$X, \emptyset, \{a\}, \{d\}, \{a, d\}, \{b, c\}, \{b, c, d\}$
Pre-open sets	**Pre-closed sets**
$X, \emptyset, \{a\}, \{b\}, \{c\}, \{a, b\}, \{a, c\}, \{a, b, c\}, \{a, b, d\}, \{a, c, d\}$	$X, \emptyset, \{b\}, \{c\}, \{d\}, \{b, d\}, \{c, d\}, \{a, b, d\}, \{a, c, d\}, \{b, c, d\}$
δ**-preopen sets**	δ**-preclosed sets**
$X, \emptyset, \{a\}, \{b\}, \{c\}, \{a, b\}, \{a, c\}, \{b, c\}, \{a, b, c\}, \{a, b, d\}, \{a, c, d\}$	$X, \emptyset, \{b\}, \{c\}, \{d\}, \{a, d\}, \{b, d\}, \{c, d\}, \{a, b, d\}, \{a, c, d\}, \{b, c, d\}$
Regular open sets	**Regular closed sets**
$X, \emptyset, \{a\}, \{b, c\}$	$X, \emptyset, \{c, d\}, \{b, c, d\}$
P_S**- open sets**	P_S**- closed sets**
$X, \emptyset, \{a\}, \{b, c\}, \{a, b, c\}$	$X, \emptyset, \{d\}, \{a, d\}, \{b, c, d\}$

$X = \{a, b, c, d\}$

12. $\boldsymbol{\tau = \{X, \emptyset, \{a\}, \{d\}, \{a, d\}, \{b, c\}, \{a, b, c\}, \{b, c, d\}\}}$

Closed sets are $\{X, \emptyset, \{a\}, \{d\}, \{a, d\}, \{b, c\}, \{a, b, c\}, \{b, c, d\}\}$

δP_S**-open sets**	δP_S**-closed sets**
$X, \emptyset, \{a\}, \{d\}, \{a, d\}, \{b, c\}, \{a, b, c\}, \{b, c, d\}$	$X, \emptyset, \{a\}, \{d\}, \{a, d\}, \{b, c\}, \{a, b, c\}, \{b, c$
δ**-open sets**	δ**-closed sets**
$X, \emptyset, \{a\}, \{d\}, \{a, d\}, \{b, c\}, \{a, b, c\}, \{b, c, d\}$	$X, \emptyset, \{a\}, \{d\}, \{a, d\}, \{b, c\}, \{a, b, c\}, \{b, c$
Semi-open sets	**Semi-closed sets**
$X, \emptyset, \{a\}, \{d\}, \{a, d\}, \{b, c\}, \{a, b, c\}, \{b, c, d\}$	$X, \emptyset, \{a\}, \{d\}, \{a, d\}, \{b, c\}, \{a, b, c\}, \{b, c$

Pre-open sets $P(X)$	**Pre-closed sets** $P(X)$
δ-preopen sets $P(X)$	**δ-preclosed sets** $P(X)$
Regular open sets $X, \emptyset, \{a\}, \{d\}, \{a,d\}, \{b,c\}, \{a,b,c\}, \{b,c,d\}$	**Regular closed sets** $X, \emptyset, \{a\}, \{d\}, \{a,d\}, \{b,c\}, \{a,b,c\}, \{b,c$
P_S- open sets $X, \emptyset, \{a\}, \{d\}, \{a,d\}, \{b,c\}, \{a,b,c\}, \{b,c,d\}$	**P_S- closed sets** $X, \emptyset, \{a\}, \{d\}, \{a,d\}, \{b,c\}, \{a,b,c\}, \{b,c$

$X = \{a,b,c,d\}$

13. $\boldsymbol{\tau = \{X, \emptyset, \{a,b\}, \{c,d\}\}}$

Closed sets are $\{X, \emptyset, \{a,b\}, \{c,d\}\}$

δP_S-open sets $X, \emptyset, \{a,b\}, \{c,d\}$	**δP_S-closed sets** $X, \emptyset, \{a,b\}, \{c,d\}$
δ-open sets $X, \emptyset, \{a,b\}, \{c,d\}$	**δ-closed sets** $X, \emptyset, \{a,b\}, \{c,d\}$
Semi-open sets $X, \emptyset, \{a,b\}, \{c,d\}$	**Semi-closed sets** $X, \emptyset, \{a,b\}, \{c,d\}$
Pre-open sets $P(X)$	**Pre-closed sets** $P(X)$
δ-preopen sets $P(X)$	**δ-preclosed sets** $P(X)$
Regular open sets $X, \emptyset, \{a,b\}, \{c,d\}$	**Regular closed sets** $X, \emptyset, \{a,b\}, \{c,d\}$
P_S- open sets $X, \emptyset, \{a,b\}, \{c,d\}$	**P_S- closed sets** $X, \emptyset, \{a,b\}, \{c,d\}$

Appendix III

I. $X = \{a, b, c\}$ $\tau_2 = \{X, \emptyset, \{a\}, \{a, b\}\}$

$\tau_1 = \{X, \emptyset, \{a\}\}$ $\tau_3 = \{X, \emptyset, \{a, b\}\}$

$\tau_4 = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}\}$ $\tau_5 = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, c\}\}$

$\tau_6 = \{X, \emptyset, \{a\}, \{a, b\}, \{a, c\}\}$ $\tau_7 = \{X, \emptyset, \{a\}, \{b, c\}\}$

$SC(X) = \tau_1 = \{X, \emptyset, \{b\}, \{c\}, \{b, c\}\}$ $\delta PO(X) = \tau_4 = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}\}$

$$\delta PO(X) = \tau_2 = \tau_3 = \tau_5 = \tau_6 = \tau_7 = \mathcal{P}(X)$$

$\boldsymbol{(1,2) - \delta P_S O(X) = \{X, \emptyset, \{b\}, \{c\}, \{b, c\}\}}$

$\boldsymbol{(1,3) - \delta P_S O(X) = \{X, \emptyset, \{b\}, \{c\}, \{b, c\}\}}$

$\boldsymbol{(1,4) - \delta P_S O(X) = \{X, \emptyset, \{b\}\}}$

$\boldsymbol{(1,5) - \delta P_S O(X) = \{X, \emptyset, \{b\}, \{c\}, \{b, c\}\}}$

$\boldsymbol{(1,6) - \delta P_S O(X) = \{X, \emptyset, \{b\}, \{c\}, \{b, c\}\}}$

$\boldsymbol{(1,7) - \delta P_S O(X) = \{X, \emptyset, \{b\}, \{c\}, \{b, c\}\}}$

II. $\tau_1 = \{X, \emptyset, \{a\}\}$ $\tau_2 = \{X, \emptyset, \{a\}, \{a, b\}\}$

$\tau_3 = \{X, \emptyset, \{a, b\}\}$ $\tau_4 = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}\}$

$\tau_5 = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, c\}\}$ $\tau_6 = \{X, \emptyset, \{a\}, \{a, b\}, \{a, c\}\}$

$\tau_7 = \{X, \emptyset, \{a\}, \{b, c\}\}$

$SC(X) = \tau_2 = \{X, \emptyset, \{b\}, \{c\}, \{b, c\}\}$ $\delta PO(X) = \tau_4 = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}\}$

$$\delta PO(X) = \tau_1 = \tau_3 = \tau_5 = \tau_6 = \tau_7 = \mathcal{P}(X)$$

$\boldsymbol{(2,1) - \delta P_S O(X) = \{X, \emptyset, \{b\}, \{c\}, \{b, c\}\}}$

$\boldsymbol{(2,3) - \delta P_S O(X) = \{X, \emptyset, \{b\}, \{c\}, \{b, c\}\}}$

$\boldsymbol{(2,4) - \delta P_S O(X) = \{X, \emptyset, \{b\}\}}$

$\boldsymbol{(2,5) - \delta P_S O(X) = \{X, \emptyset, \{b\}, \{c\}, \{b, c\}\}}$

$\boldsymbol{(2,6) - \delta P_S O(X) = \{X, \emptyset, \{b\}, \{c\}, \{b, c\}\}}$

$\boldsymbol{(2,7) - \delta P_S O(X) = \{X, \emptyset, \{b\}, \{c\}, \{b, c\}\}}$

III. $\tau_1 = \{X, \emptyset, \{a\}\}$ $\tau_2 = \{X, \emptyset, \{a\}, \{a, b\}\}$

$\tau_3 = \{X, \emptyset, \{a, b\}\}$ $\tau_4 = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}\}$

$\tau_5 = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, c\}\}$ $\tau_6 = \{X, \emptyset, \{a\}, \{a, b\}, \{a, c\}\}$

$\tau_7 = \{X, \emptyset, \{a\}, \{b, c\}\}$

$SC(X) = \tau_3 = \{X, \emptyset, \{c\}\}$ $\quad \delta PO(X) = \tau_4 = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}\}$

$$\delta PO(X) = \tau_1 = \tau_2 = \tau_5 = \tau_6 = \tau_7 = \mathcal{P}(X)$$

$\boldsymbol{(3,1) - \delta P_S O(X) = \{X, \emptyset, \{c\}\}}$

$\boldsymbol{(3,2) - \delta P_S O(X) = \{X, \emptyset, \{c\}\}}$

$\boldsymbol{(3,4) - \delta P_S O(X) = \{X, \emptyset\}}$

$\boldsymbol{(3,5) - \delta P_S O(X) = \{X, \emptyset, \{c\}\}}$

$\boldsymbol{(3,6) - \delta P_S O(X) = \{X, \emptyset, \{c\}\}}$

$\boldsymbol{(3,7) - \delta P_S O(X) = \{X, \emptyset, \{c\}\}}$

IV. $\tau_1 = \{X, \emptyset, \{a\}\}$ $\quad \tau_2 = \{X, \emptyset, \{a\}, \{a, b\}\}$

$\tau_3 = \{X, \emptyset, \{a, b\}\}$ $\quad \tau_4 = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}\}$

$\tau_5 = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, c\}\}$ $\quad \tau_6 = \{X, \emptyset, \{a\}, \{a, b\}, \{a, c\}\}$

$\tau_7 = \{X, \emptyset, \{a\}, \{b, c\}\}$

$SC(X) = \tau_4 = \{X, \emptyset, \{a\}, \{b\}, \{c\}, \{a, c\}, \{b, c\}\}$

$$\delta PO(X) = \tau_1 = \tau_2 = \tau_3 = \tau_5 = \tau_6 = \tau_7 = \mathcal{P}(X)$$

$\boldsymbol{(4,1) = \{X, \emptyset, \{a\}, \{b\}, \{c\}, \{a, c\}, \{b, c\}\}}$

$\boldsymbol{(4,2) = \{X, \emptyset, \{a\}, \{b\}, \{c\}, \{a, c\}, \{b, c\}\}}$

$\boldsymbol{(4,3) = \{X, \emptyset, \{a\}, \{b\}, \{c\}, \{a, c\}, \{b, c\}\}}$

$\boldsymbol{(4,5) = \{X, \emptyset, \{a\}, \{b\}, \{c\}, \{a, c\}, \{b, c\}\}}$

$\boldsymbol{(4,6) = \{X, \emptyset, \{a\}, \{b\}, \{c\}, \{a, c\}, \{b, c\}\}}$

$\boldsymbol{(4,7) = \{X, \emptyset, \{a\}, \{b\}, \{c\}, \{a, c\}, \{b, c\}\}}$

V. $\tau_1 = \{X, \emptyset, \{a\}\}$ $\quad \tau_2 = \{X, \emptyset, \{a\}, \{a, b\}\}$

$\tau_3 = \{X, \emptyset, \{a, b\}\}$ $\quad \tau_4 = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}\}$

$\tau_5 = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, c\}\}$ $\quad \tau_6 = \{X, \emptyset, \{a\}, \{a, b\}, \{a, c\}\}$

$\tau_7 = \{X, \emptyset, \{a\}, \{b, c\}\}$

$SC(X) = \tau_5 = \{X, \emptyset, \{b\}, \{c\}, \{a, c\}, \{b, c\}\}$ $\quad \delta PO(X) = \tau_4 = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}\}$

$$\delta PO(X) = \tau_1 = \tau_2 = \tau_3 = \tau_6 = \tau_7 = \mathcal{P}(X)$$

$\boldsymbol{(5,1) = \{X, \emptyset, \{b\}, \{c\}, \{a, c\}, \{b, c\}\}}$

$(5,2) = \{X, \emptyset, \{b\}, \{c\}, \{a,c\}, \{b,c\}\}$

$(5,3) = \{X, \emptyset, \{b\}, \{c\}, \{a,c\}, \{b,c\}\}$

$(5,4) = \{X, \emptyset, \{b\}\}$

$(5,6) = \{X, \emptyset, \{b\}, \{c\}, \{a,c\}, \{b,c\}\}$

$(5,7) = \{X, \emptyset, \{b\}, \{c\}, \{a,c\}, \{b,c\}\}$

VI. $\tau_1 = \{X, \emptyset, \{a\}\}$ $\tau_2 = \{X, \emptyset, \{a\}, \{a,b\}\}$

$\tau_3 = \{X, \emptyset, \{a,b\}\}$ $\tau_4 = \{X, \emptyset, \{a\}, \{b\}, \{a,b\}\}$

$\tau_5 = \{X, \emptyset, \{a\}, \{b\}, \{a,b\}, \{a,c\}\}$ $\tau_6 = \{X, \emptyset, \{a\}, \{a,b\}, \{a,c\}\}$

$\tau_7 = \{X, \emptyset, \{a\}, \{b,c\}\}$

$SC(X) = \tau_6 = \{X, \emptyset, \{b\}, \{c\}, \{b,c\}\}$ $\delta PO(X) = \tau_4 = \{X, \emptyset, \{a\}, \{b\}, \{a,b\}\}$

$$\delta PO(X) = \tau_1 = \tau_2 = \tau_3 = \tau_5 = \tau_7 = \mathcal{P}(X)$$

$(6,1) = \{X, \emptyset, \{b\}, \{c\}, \{b,c\}\}$

$(6,2) = \{X, \emptyset, \{b\}, \{c\}, \{b,c\}\}$

$(6,3) = \{X, \emptyset, \{b\}, \{c\}, \{b,c\}\}$

$(6,4) = \{X, \emptyset, \{b\}\}$

$(6,5) = \{X, \emptyset, \{b\}, \{c\}, \{b,c\}\}$

$(6,7) = \{X, \emptyset, \{b\}, \{c\}, \{b,c\}\}$

VII. $\tau_1 = \{X, \emptyset, \{a\}\}$ $\tau_2 = \{X, \emptyset, \{a\}, \{a,b\}\}$

$\tau_3 = \{X, \emptyset, \{a,b\}\}$ $\tau_4 = \{X, \emptyset, \{a\}, \{b\}, \{a,b\}\}$

$\tau_5 = \{X, \emptyset, \{a\}, \{b\}, \{a,b\}, \{a,c\}\}$ $\tau_6 = \{X, \emptyset, \{a\}, \{a,b\}, \{a,c\}\}$

$\tau_7 = \{X, \emptyset, \{a\}, \{b,c\}\}$

$SC(X) = \tau_7 = \{X, \emptyset, \{a\}, \{b,c\}\}$ $\delta PO(X) = \tau_4 = \{X, \emptyset, \{a\}, \{b\}, \{a,b\}\}$

$$\delta PO(X) = \tau_1 = \tau_2 = \tau_3 = \tau_5 = \tau_6 = \mathcal{P}(X)$$

$(7,1) = \{X, \emptyset, \{a\}, \{b,c\}\}$

$(7,2) = \{X, \emptyset, \{a\}, \{b,c\}\}$

$(7,3) = \{X, \emptyset, \{a\}, \{b,c\}\}$

$(7,4) = \{X, \emptyset, \{a\}\}$

$(7,5) = \{X, \emptyset, \{a\}, \{b,c\}\}$

$(7,6) = \{X, \emptyset, \{a\}, \{b,c\}\}$

Appendix IV

I. $X = \{a, b, c, d\}$

$\tau_1 = \{X, \emptyset, \{a\}\}$ $\tau_2 = \{X, \emptyset, \{a, b\}\}$

$\tau_3 = \{X, \emptyset, \{a, b, c\}\}$

$\tau_4 = \{X, \emptyset, \{a\}, \{a, b\}\}$ $\tau_5 = \{X, \emptyset, \{a\}, \{c\}, \{a, b\}, \{a, c\}, \{a, b, c\}, \{a, c, d\}\}$

$\tau_6 = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$ $\tau_7 = \{X, \emptyset, \{c\}, \{a, b\}, \{a, b, c\}\}$

$\tau_8 = \{X, \emptyset, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$ $\tau_9 = \{X, \emptyset, \{a\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$

$\tau_{10} = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}\}$ $\tau_{11} = \{X, \emptyset, \{a\}, \{b, c\}, \{a, b, c\}\}$

$\tau_{12} = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$ $\tau_{13} = \{X, \emptyset, \{a, b\}, \{c, d\}\}$

$SC(X) = \tau_1 = \{X, \emptyset, \{b\}, \{c\}, \{d\}, \{b, c\}, \{b, d\}, \{c, d\}, \{b, c, d\}\}$

$\delta PO(X) = \tau_5 = \{X, \emptyset, \{a\}, \{c\}, \{a, c\}, \{b, c\}, \{a, b, c\}, \{b, c, d\}, \{a, c, d\}\}$

$\delta PO(X) = \tau_6 = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$

$\delta PO(X) = \tau_7 = \{X, \emptyset, \{a\}, \{b\}, \{c\}, \{a, b\}, \{a, c\}, \{b, c\}, \{a, b, c\}, \{b, c, d\}, \{a, c, d\}\}$

$\delta PO(X) = \tau_{10} = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$

$\delta PO(X) = \tau_{11} = \{X, \emptyset, \{a\}, \{b\}, \{c\}, \{a, b\}, \{a, c\}, \{b, c\}, \{a, b, c\}, \{a, b, d\}, \{a, c, d\}\}$

$$\delta PO(X) = \tau_2 = \tau_3 = \tau_4 = \tau_8 = \tau_9 = \tau_{12} = \tau_{13} = \mathcal{P}(X)$$

$(1,2) = \{X, \emptyset, \{b\}, \{c\}, \{d\}, \{b, c\}, \{b, d\}, \{c, d\}, \{b, c, d\}\}$

$(1,3) = \{X, \emptyset, \{b\}, \{c\}, \{d\}, \{b, c\}, \{b, d\}, \{c, d\}, \{b, c, d\}\}$

$(1,4) = \{X, \emptyset, \{b\}, \{c\}, \{d\}, \{b, c\}, \{b, d\}, \{c, d\}, \{b, c, d\}\}$

$(1,5) = \{X, \emptyset, \{c\}, \{b, c\}, \{b, c, d\}\}$

$(1,6) = \{X, \emptyset, \{b\}\}$

$(1,7) = \{X, \emptyset, \{b\}, \{c\}, \{b, c\}\}, \{b, c, d\}\}$

$(1,8) = \{X, \emptyset, \{b\}, \{c\}, \{d\}, \{b, c\}, \{b, d\}, \{c, d\}, \{b, c, d\}\}$

$(1,9) = \{X, \emptyset, \{b\}, \{c\}, \{d\}, \{b, c\}, \{b, d\}, \{c, d\}, \{b, c, d\}\}$

$(1,10) = \{X, \emptyset, \{b\}\}$

$(1,11) = \{X, \emptyset, \{b\}, \{c\}, \{b, c\}\}$

$(1,12) = \{X, \emptyset, \{b\}, \{c\}, \{d\}, \{b, c\}, \{b, d\}, \{c, d\}, \{b, c, d\}\}$

$(1,13) = \{X, \emptyset, \{b\}, \{c\}, \{d\}, \{b, c\}, \{b, d\}, \{c, d\}, \{b, c, d\}\}$

II. $X = \{a, b, c, d\}$ $\tau_2 = \{X, \emptyset, \{a, b\}\}$

$\tau_1 = \{X, \emptyset, \{a\}\}$ $\tau_3 = \{X, \emptyset, \{a, b, c\}\}$

$\tau_4 = \{X, \emptyset, \{a\}, \{a, b\}\}$ $\tau_5 = \{X, \emptyset, \{a\}, \{c\}, \{a, b\}, \{a, c\}, \{a, b, c\}, \{a, c, d\}\}$

$\tau_6 = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$ $\tau_7 = \{X, \emptyset, \{c\}, \{a, b\}, \{a, b, c\}\}$

$\tau_8 = \{X, \emptyset, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$ $\tau_9 = \{X, \emptyset, \{a\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$

$\tau_{10} = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}\}$ $\tau_{11} = \{X, \emptyset, \{a\}, \{b, c\}, \{a, b, c\}\}$

$\tau_{12} = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$ $\tau_{13} = \{X, \emptyset, \{a, b\}, \{c, d\}\}$

$SC(X) = \tau_1 = \{X, \emptyset, \{b\}, \{c\}, \{d\}, \{b, c\}, \{b, d\}, \{c, d\}, \{b, c, d\}\}$

$\delta PO(X) = \tau_5 = \{X, \emptyset, \{a\}, \{c\}, \{a, c\}, \{b, c\}, \{a, b, c\}, \{b, c, d\}, \{a, c, d\}\}$

$\delta PO(X) = \tau_6 = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$

$\delta PO(X) = \tau_7 = \{X, \emptyset, \{a\}, \{b\}, \{c\}, \{a, b\}, \{a, c\}, \{b, c\}, \{a, b, c\}, \{b, c, d\}, \{a, c, d\}\}$

$\delta PO(X) = \tau_{10} = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$

$\delta PO(X) = \tau_{11} = \{X, \emptyset, \{a\}, \{b\}, \{c\}, \{a, b\}, \{a, c\}, \{b, c\}, \{a, b, c\}, \{a, b, d\}, \{a, c, d\}\}$

$$\delta PO(X) = \tau_2 = \tau_3 = \tau_4 = \tau_8 = \tau_9 = \tau_{12} = \tau_{13} = \mathcal{P}(X)$$

$\boldsymbol{(2, 1) = \{X, \emptyset, \{c\}, \{d\}, \{c, d\}\}}$

$\boldsymbol{(2, 3) = \{X, \emptyset, \{c\}, \{d\}, \{c, d\}\}}$

$\boldsymbol{(2, 4) = \{X, \emptyset, \{c\}, \{d\}, \{c, d\}\}}$

$\boldsymbol{(2, 5) = \{X, \emptyset, \{c\}\}}$

$\boldsymbol{(2, 6) = \{X, \emptyset\}}$

$\boldsymbol{(2, 7) = \{X, \emptyset\}}$

$\boldsymbol{(2, 8) = \{X, \emptyset, \{c\}, \{d\}, \{c, d\}\}}$

$\boldsymbol{(2, 9) = \{X, \emptyset, \{c\}, \{d\}, \{c, d\}\}}$

$\boldsymbol{(2, 10) = \{X, \emptyset\}}$

$\boldsymbol{(2, 11) = \{X, \emptyset, \{c\}\}}$

$\boldsymbol{(2, 12) = \{X, \emptyset, \{c\}, \{d\}, \{c, d\}\}}$

$\boldsymbol{(2, 13) = \{X, \emptyset, \{c\}, \{d\}, \{c, d\}\}}$

III. $X = \{a, b, c, d\}$ $\tau_2 = \{X, \emptyset, \{a, b\}\}$

$\tau_1 = \{X, \emptyset, \{a\}\}$ $\tau_3 = \{X, \emptyset, \{a, b, c\}\}$

$\tau_4 = \{X, \emptyset, \{a\}, \{a, b\}\}$ $\tau_5 = \{X, \emptyset, \{a\}, \{c\}, \{a, b\}, \{a, c\}, \{a, b, c\}, \{a, c, d\}\}$

$\tau_6 = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$ $\tau_7 = \{X, \emptyset, \{c\}, \{a, b\}, \{a, b, c\}\}$

$\tau_8 = \{X, \emptyset, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$ $\tau_9 = \{X, \emptyset, \{a\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$

$\tau_{10} = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}\}$ $\tau_{11} = \{X, \emptyset, \{a\}, \{b, c\}, \{a, b, c\}\}$

$\tau_{12} = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$ $\tau_{13} = \{X, \emptyset, \{a, b\}, \{c, d\}\}$

$SC(X) = \tau_3 = \{X, \emptyset, \{d\}\}$

$\delta PO(X) = \tau_5 = \{X, \emptyset, \{a\}, \{c\}, \{a, c\}, \{b, c\}, \{a, b, c\}, \{b, c, d\}, \{a, c, d\}\}$

$\delta PO(X) = \tau_6 = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$

$\delta PO(X) = \tau_7 = \{X, \emptyset, \{a\}, \{b\}, \{c\}, \{a, b\}, \{a, c\}, \{b, c\}, \{a, b, c\}, \{b, c, d\}, \{a, c, d\}\}$

$\delta PO(X) = \tau_{10} = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$

$\delta PO(X) = \tau_{11} = \{X, \emptyset, \{a\}, \{b\}, \{c\}, \{a, b\}, \{a, c\}, \{b, c\}, \{a, b, c\}, \{a, b, d\}, \{a, c, d\}\}$

$$\delta PO(X) = \tau_1 = \tau_2 = \tau_4 = \tau_8 = \tau_9 = \tau_{12} = \tau_{13} = \mathcal{P}(X)$$

$\mathbf{(3, 1) = \{X, \emptyset, \{d\}\}}$

$\mathbf{(3, 2) = \{X, \emptyset, \{d\}\}}$

$\mathbf{(3, 4) = \{X, \emptyset, \{d\}\}}$

$\mathbf{(3, 5) = \{X, \emptyset\}}$

$\mathbf{(3, 6) = \{X, \emptyset\}}$

$\mathbf{(3, 7) = \{X, \emptyset\}}$

$\mathbf{(3, 8) = \{X, \emptyset, \{d\}\}}$

$\mathbf{(3, 9) = \{X, \emptyset, \{d\}\}}$

$\mathbf{(3, 10) = \{X, \emptyset\}}$

$\mathbf{(3, 11) = \{X, \emptyset\}}$

$\mathbf{(3, 12) = \{X, \emptyset, \{d\}\}}$

$\mathbf{(3, 13) = \{X, \emptyset, \{d\}\}}$

IV. $X = \{a, b, c, d\}$ $\tau_2 = \{X, \emptyset, \{a, b\}\}$

$\tau_1 = \{X, \emptyset, \{a\}\}$ $\tau_3 = \{X, \emptyset, \{a, b, c\}\}$

$\tau_4 = \{X, \emptyset, \{a\}, \{a, b\}\}$ $\tau_5 = \{X, \emptyset, \{a\}, \{c\}, \{a, b\}, \{a, c\}, \{a, b, c\}, \{a, c, d\}\}$

$\tau_6 = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$ $\tau_7 = \{X, \emptyset, \{c\}, \{a, b\}, \{a, b, c\}\}$

$\tau_8 = \{X, \emptyset, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$ $\tau_9 = \{X, \emptyset, \{a\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$

$\tau_{10} = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}\}$ $\tau_{11} = \{X, \emptyset, \{a\}, \{b, c\}, \{a, b, c\}\}$

$\tau_{12} = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$ $\tau_{13} = \{X, \emptyset, \{a, b\}, \{c, d\}\}$

$SC(X) = \tau_4 = \{X, \emptyset, \{b\}, \{c\}, \{d\}, \{b, c\}, \{b, d\}, \{c, d\}, \{b, c, d\}\}$

$\delta PO(X) = \tau_5 = \{X, \emptyset, \{a\}, \{c\}, \{a, c\}, \{b, c\}, \{a, b, c\}, \{b, c, d\}, \{a, c, d\}\}$

$\delta PO(X) = \tau_6 = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$

$\delta PO(X) = \tau_7 = \{X, \emptyset, \{a\}, \{b\}, \{c\}, \{a, b\}, \{a, c\}, \{b, c\}, \{a, b, c\}, \{b, c, d\}, \{a, c, d\}\}$

$\delta PO(X) = \tau_{10} = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$

$\delta PO(X) = \tau_{11} = \{X, \emptyset, \{a\}, \{b\}, \{c\}, \{a, b\}, \{a, c\}, \{b, c\}, \{a, b, c\}, \{a, b, d\}, \{a, c, d\}\}$

$$\delta PO(X) = \tau_1 = \tau_2 = \tau_3 = \tau_8 = \tau_9 = \tau_{12} = \tau_{13} = \mathcal{P}(X)$$

$\boldsymbol{(4, 1) = \{X, \emptyset, \{b\}, \{c\}, \{d\}, \{b, c\}, \{b, d\}, \{c, d\}, \{b, c, d\}\}}$

$\boldsymbol{(4, 2) = \{X, \emptyset, \{b\}, \{c\}, \{d\}, \{b, c\}, \{b, d\}, \{c, d\}, \{b, c, d\}\}}$

$\boldsymbol{(4, 3) = \{X, \emptyset, \{b\}, \{c\}, \{d\}, \{b, c\}, \{b, d\}, \{c, d\}, \{b, c, d\}\}}$

$\boldsymbol{(4, 5) = \{X, \emptyset, \{c\}, \{b, c\}, \{b, c, d\}\}}$

$\boldsymbol{(4, 6) = \{X, \emptyset, \{b\}\}}$

$\boldsymbol{(4, 7) = \{X, \emptyset, \{b\}, \{c\}, \{b, c\}, \{b, c, d\}\}}$

$\boldsymbol{(4, 8) = \{X, \emptyset, \{b\}, \{c\}, \{d\}, \{b, c\}, \{b, d\}, \{c, d\}, \{b, c, d\}\}}$

$\boldsymbol{(4, 9) = \{X, \emptyset, \{b\}, \{c\}, \{d\}, \{b, c\}, \{b, d\}, \{c, d\}, \{b, c, d\}\}}$

$\boldsymbol{(4, 10) = \{X, \emptyset, \{b\}\}}$

$\boldsymbol{(4, 11) = \{X, \emptyset, \{b\}, \{c\}, \{b, c\}\}}$

$\boldsymbol{(4, 12) = \{X, \emptyset, \{b\}, \{c\}, \{d\}, \{b, c\}, \{b, d\}, \{c, d\}, \{b, c, d\}\}}$

$\boldsymbol{(4, 13) = \{X, \emptyset, \{b\}, \{c\}, \{d\}, \{b, c\}, \{b, d\}, \{c, d\}, \{b, c, d\}\}}$

V. $X = \{a, b, c, d\}$ $\tau_2 = \{X, \emptyset, \{a, b\}\}$

$\tau_1 = \{X, \emptyset, \{a\}\}$ $\tau_3 = \{X, \emptyset, \{a, b, c\}\}$

$\tau_4 = \{X, \emptyset, \{a\}, \{a, b\}\}$ $\tau_5 = \{X, \emptyset, \{a\}, \{c\}, \{a, b\}, \{a, c\}, \{a, b, c\}, \{a, c, d\}\}$

$\tau_6 = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$ $\tau_7 = \{X, \emptyset, \{c\}, \{a, b\}, \{a, b, c\}\}$

$\tau_8 = \{X, \emptyset, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$ $\tau_9 = \{X, \emptyset, \{a\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$

$\tau_{10} = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}\}$ $\tau_{11} = \{X, \emptyset, \{a\}, \{b, c\}, \{a, b, c\}\}$

$\tau_{12} = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$ $\tau_{13} = \{X, \emptyset, \{a, b\}, \{c, d\}\}$

$SC(X) = \tau_5 = \{X, \emptyset, \{b\}, \{c\}, \{d\}, \{a, b\}, \{b, c\}, \{b, d\}, \{c, d\}, \{a, b, d\}, \{b, c, d\}\}$

$\delta PO(X) = \tau_6 = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$

$\delta PO(X) = \tau_7 = \{X, \emptyset, \{a\}, \{b\}, \{c\}, \{a, b\}, \{a, c\}, \{b, c\}, \{a, b, c\}, \{b, c, d\}, \{a, c, d\}\}$

$\delta PO(X) = \tau_{10} = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$

$\delta PO(X) = \tau_{11} = \{X, \emptyset, \{a\}, \{b\}, \{c\}, \{a, b\}, \{a, c\}, \{b, c\}, \{a, b, c\}, \{a, b, d\}, \{a, c, d\}\}$

$$\delta PO(X) = \tau_1 = \tau_2 = \tau_3 = \tau_4 = \tau_8 = \tau_9 = \tau_{12} = \tau_{13} = \mathcal{P}(X)$$

$\mathbf{(5,1) = \{X, \emptyset, \{b\}, \{c\}, \{d\}, \{a, b\}, \{b, c\}, \{b, d\}, \{c, d\}, \{a, b, d\}, \{b, c, d\}\}}$

$\mathbf{(5,2) = \{X, \emptyset, \{b\}, \{c\}, \{d\}, \{a, b\}, \{b, c\}, \{b, d\}, \{c, d\}, \{a, b, d\}, \{b, c, d\}\}}$

$\mathbf{(5,3) = \{X, \emptyset, \{b\}, \{c\}, \{d\}, \{a, b\}, \{b, c\}, \{b, d\}, \{c, d\}, \{a, b, d\}, \{b, c, d\}\}}$

$\mathbf{(5,4) = \{X, \emptyset, \{b\}, \{c\}, \{d\}, \{a, b\}, \{b, c\}, \{b, d\}, \{c, d\}, \{a, b, d\}, \{b, c, d\}\}}$

$\mathbf{(5,6) = \{X, \emptyset, \{b\}, \{a, b\}, \{b, c, d\}\}}$

$\mathbf{(5,7) = \{X, \emptyset, \{b\}, \{c\}, \{a, b\}, \{b, c\}, \{b, c, d\}\}}$

$\mathbf{(5,8) = \{X, \emptyset, \{b\}, \{c\}, \{d\}, \{a, b\}, \{b, c\}, \{b, d\}, \{c, d\}, \{a, b, d\}, \{b, c, d\}\}}$

$\mathbf{(5,9) = \{X, \emptyset, \{b\}, \{c\}, \{d\}, \{a, b\}, \{b, c\}, \{b, d\}, \{c, d\}, \{a, b, d\}, \{b, c, d\}\}}$

$\mathbf{(5,10) = \{X, \emptyset, \{b\}, \{a, b\}, \{a, b, d\}\}}$

$\mathbf{(5,11) = \{X, \emptyset, \{b\}, \{c\}, \{a, b\}, \{b, c\}, \{a, b, d\}\}}$

$\mathbf{(5,12) = \{X, \emptyset, \{b\}, \{c\}, \{d\}, \{a, b\}, \{b, c\}, \{b, d\}, \{c, d\}, \{a, b, d\}, \{b, c, d\}\}}$

$\mathbf{(5,13) = \{X, \emptyset, \{b\}, \{c\}, \{d\}, \{a, b\}, \{b, c\}, \{b, d\}, \{c, d\}, \{a, b, d\}, \{b, c, d\}\}}$

VI. $X = \{a, b, c, d\}$ $\tau_2 = \{X, \emptyset, \{a, b\}\}$

$\tau_1 = \{X, \emptyset, \{a\}\}$ $\tau_3 = \{X, \emptyset, \{a, b, c\}\}$

$\tau_4 = \{X, \emptyset, \{a\}, \{a, b\}\}$ $\tau_5 = \{X, \emptyset, \{a\}, \{c\}, \{a, b\}, \{a, c\}, \{a, b, c\}, \{a, c, d\}\}$

$\tau_6 = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$ $\tau_7 = \{X, \emptyset, \{c\}, \{a, b\}, \{a, b, c\}\}$

$\tau_8 = \{X, \emptyset, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$ $\tau_9 = \{X, \emptyset, \{a\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$

$\tau_{10} = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}\}$ $\tau_{11} = \{X, \emptyset, \{a\}, \{b, c\}, \{a, b, c\}\}$

$\tau_{12} = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$ $\tau_{13} = \{X, \emptyset, \{a, b\}, \{c, d\}\}$

$SC(X) = \tau_6 = \{X, \emptyset, \{b\}, \{c\}, \{d\}, \{a, b\}, \{b, c\}, \{b, d\}, \{c, d\}, \{a, b, d\}, \{b, c, d\}\}$

$\delta PO(X) = \tau_5 = \{X, \emptyset, \{a\}, \{c\}, \{a, c\}, \{b, c\}, \{a, b, c\}, \{a, c, d\}, \{b, c, d\}\}$

$\delta PO(X) = \tau_7 = \{X, \emptyset, \{a\}, \{b\}, \{c\}, \{a, b\}, \{a, c\}, \{b, c\}, \{a, b, c\}, \{b, c, d\}, \{a, c, d\}\}$

$\delta PO(X) = \tau_{10} = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$

$\delta PO(X) = \tau_{11} = \{X, \emptyset, \{a\}, \{b\}, \{c\}, \{a, b\}, \{a, c\}, \{b, c\}, \{a, b, c\}, \{a, b, d\}, \{a, c, d\}\}$

$$\delta PO(X) = \tau_1 = \tau_2 = \tau_3 = \tau_4 = \tau_8 = \tau_9 = \tau_{12} = \tau_{13} = \mathcal{P}(X)$$

$\mathbf{(6,1)} = \{\boldsymbol{X}, \emptyset, \{\boldsymbol{b}\}, \{\boldsymbol{c}\}, \{\boldsymbol{d}\}, \{\boldsymbol{a}, \boldsymbol{b}\}, \{\boldsymbol{b}, \boldsymbol{c}\}, \{\boldsymbol{b}, \boldsymbol{d}\}, \{\boldsymbol{c}, \boldsymbol{d}\}, \{\boldsymbol{a}, \boldsymbol{b}, \boldsymbol{d}\}, \{\boldsymbol{b}, \boldsymbol{c}, \boldsymbol{d}\}\}$

$\mathbf{(6,2)} = \{\boldsymbol{X}, \emptyset, \{\boldsymbol{b}\}, \{\boldsymbol{c}\}, \{\boldsymbol{d}\}, \{\boldsymbol{a}, \boldsymbol{b}\}, \{\boldsymbol{b}, \boldsymbol{c}\}, \{\boldsymbol{b}, \boldsymbol{d}\}, \{\boldsymbol{c}, \boldsymbol{d}\}, \{\boldsymbol{a}, \boldsymbol{b}, \boldsymbol{d}\}, \{\boldsymbol{b}, \boldsymbol{c}, \boldsymbol{d}\}\}$

$\mathbf{(6,3)} = \{\boldsymbol{X}, \emptyset, \{\boldsymbol{b}\}, \{\boldsymbol{c}\}, \{\boldsymbol{d}\}, \{\boldsymbol{a}, \boldsymbol{b}\}, \{\boldsymbol{b}, \boldsymbol{c}\}, \{\boldsymbol{b}, \boldsymbol{d}\}, \{\boldsymbol{c}, \boldsymbol{d}\}, \{\boldsymbol{a}, \boldsymbol{b}, \boldsymbol{d}\}, \{\boldsymbol{b}, \boldsymbol{c}, \boldsymbol{d}\}\}$

$\mathbf{(6,4)} = \{\boldsymbol{X}, \emptyset, \{\boldsymbol{b}\}, \{\boldsymbol{c}\}, \{\boldsymbol{d}\}, \{\boldsymbol{a}, \boldsymbol{b}\}, \{\boldsymbol{b}, \boldsymbol{c}\}, \{\boldsymbol{b}, \boldsymbol{d}\}, \{\boldsymbol{c}, \boldsymbol{d}\}, \{\boldsymbol{a}, \boldsymbol{b}, \boldsymbol{d}\}, \{\boldsymbol{b}, \boldsymbol{c}, \boldsymbol{d}\}\}$

$\mathbf{(6,5)} = \{\boldsymbol{X}, \emptyset, \{\boldsymbol{a}\}, \{\boldsymbol{c}\}, \{\boldsymbol{a}, \boldsymbol{c}\}, \{\boldsymbol{b}, \boldsymbol{c}\}, \{\boldsymbol{a}, \boldsymbol{b}, \boldsymbol{c}\}, \{\boldsymbol{a}, \boldsymbol{c}, \boldsymbol{d}\}, \{\boldsymbol{b}, \boldsymbol{c}, \boldsymbol{d}\}\}$

$\mathbf{(6,7)} = \{\boldsymbol{X}, \emptyset, \{\boldsymbol{a}\}, \{\boldsymbol{b}\}, \{\boldsymbol{c}\}, \{\boldsymbol{a}, \boldsymbol{b}\}, \{\boldsymbol{a}, \boldsymbol{c}\}, \{\boldsymbol{b}, \boldsymbol{c}\}, \{\boldsymbol{a}, \boldsymbol{b}, \boldsymbol{c}\}, \{\boldsymbol{a}, \boldsymbol{c}, \boldsymbol{d}\}, \{\boldsymbol{b}, \boldsymbol{c}, \boldsymbol{d}\}\}$

$\mathbf{(6,8)} = \{\boldsymbol{X}, \emptyset, \{\boldsymbol{b}\}, \{\boldsymbol{c}\}, \{\boldsymbol{d}\}, \{\boldsymbol{a}, \boldsymbol{b}\}, \{\boldsymbol{b}, \boldsymbol{c}\}, \{\boldsymbol{b}, \boldsymbol{d}\}, \{\boldsymbol{c}, \boldsymbol{d}\}, \{\boldsymbol{a}, \boldsymbol{b}, \boldsymbol{d}\}, \{\boldsymbol{b}, \boldsymbol{c}, \boldsymbol{d}\}\}$

$\mathbf{(6,9)} = \{\boldsymbol{X}, \emptyset, \{\boldsymbol{b}\}, \{\boldsymbol{c}\}, \{\boldsymbol{d}\}, \{\boldsymbol{a}, \boldsymbol{b}\}, \{\boldsymbol{b}, \boldsymbol{c}\}, \{\boldsymbol{b}, \boldsymbol{d}\}, \{\boldsymbol{c}, \boldsymbol{d}\}, \{\boldsymbol{a}, \boldsymbol{b}, \boldsymbol{d}\}, \{\boldsymbol{b}, \boldsymbol{c}, \boldsymbol{d}\}\}$

$\mathbf{(6,10)} = \{\boldsymbol{X}, \emptyset, \{\boldsymbol{a}\}, \{\boldsymbol{b}\}, \{\boldsymbol{a}, \boldsymbol{b}\}, \{\boldsymbol{a}, \boldsymbol{b}, \boldsymbol{c}\}, \{\boldsymbol{a}, \boldsymbol{b}, \boldsymbol{d}\}\}$

$\mathbf{(6,11)} = \{\boldsymbol{X}, \emptyset, \{\boldsymbol{a}\}, \{\boldsymbol{b}\}, \{\boldsymbol{c}\}, \{\boldsymbol{a}, \boldsymbol{b}\}, \{\boldsymbol{a}, \boldsymbol{c}\}, \{\boldsymbol{b}, \boldsymbol{c}\}, \{\boldsymbol{a}, \boldsymbol{b}, \boldsymbol{c}\}, \{\boldsymbol{a}, \boldsymbol{c}, \boldsymbol{d}\}, \{\boldsymbol{a}, \boldsymbol{b}, \boldsymbol{d}\}\}$

$\mathbf{(6,12)} = \{\boldsymbol{X}, \emptyset, \{\boldsymbol{b}\}, \{\boldsymbol{c}\}, \{\boldsymbol{d}\}, \{\boldsymbol{a}, \boldsymbol{b}\}, \{\boldsymbol{b}, \boldsymbol{c}\}, \{\boldsymbol{b}, \boldsymbol{d}\}, \{\boldsymbol{c}, \boldsymbol{d}\}, \{\boldsymbol{a}, \boldsymbol{b}, \boldsymbol{d}\}, \{\boldsymbol{b}, \boldsymbol{c}, \boldsymbol{d}\}\}$

$\mathbf{(6,13)} = \{\boldsymbol{X}, \emptyset, \{\boldsymbol{b}\}, \{\boldsymbol{c}\}, \{\boldsymbol{d}\}, \{\boldsymbol{a}, \boldsymbol{b}\}, \{\boldsymbol{b}, \boldsymbol{c}\}, \{\boldsymbol{b}, \boldsymbol{d}\}, \{\boldsymbol{c}, \boldsymbol{d}\}, \{\boldsymbol{a}, \boldsymbol{b}, \boldsymbol{d}\}, \{\boldsymbol{b}, \boldsymbol{c}, \boldsymbol{d}\}\}$

VII. $X = \{a, b, c, d\}$ $\tau_2 = \{X, \emptyset, \{a, b\}\}$

$\tau_1 = \{X, \emptyset, \{a\}\}$ $\tau_3 = \{X, \emptyset, \{a, b, c\}\}$

$\tau_4 = \{X, \emptyset, \{a\}, \{a, b\}\}$ $\tau_5 = \{X, \emptyset, \{a\}, \{c\}, \{a, b\}, \{a, c\}, \{a, b, c\}, \{a, c, d\}\}$

$\tau_6 = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$ $\tau_7 = \{X, \emptyset, \{c\}, \{a, b\}, \{a, b, c\}\}$

$\tau_8 = \{X, \emptyset, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$ $\tau_9 = \{X, \emptyset, \{a\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$

$\tau_{10} = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}\}$ $\tau_{11} = \{X, \emptyset, \{a\}, \{b, c\}, \{a, b, c\}\}$

$\tau_{12} = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$ $\tau_{13} = \{X, \emptyset, \{a, b\}, \{c, d\}\}$

$SC(X) = \tau_7 = \{X, \emptyset, \{c\}, \{d\}, \{a, b\}, \{c, d\}, \{a, b, d\}\}$

$\delta PO(X) = \tau_5 = \{X, \emptyset, \{a\}, \{c\}, \{a, c\}, \{b, c\}, \{a, b, c\}, \{a, c, d\}, \{b, c, d\}\}$

$\delta PO(X) = \tau_6 = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$

$\delta PO(X) = \tau_{10} = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$

$\delta PO(X) = \tau_{11} = \{X, \emptyset, \{a\}, \{b\}, \{c\}, \{a, b\}, \{a, c\}, \{b, c\}, \{a, b, c\}, \{a, b, d\}, \{a, c, d\}\}$

$$\delta PO(X) = \tau_1 = \tau_2 = \tau_3 = \tau_4 = \tau_8 = \tau_9 = \tau_{12} = \tau_{13} = \mathcal{P}(X)$$

$\boldsymbol{(7,1) = \{X, \emptyset, \{c\}, \{d\}, \{a, b\}, \{c, d\}, \{a, b, d\}\}}$

$\boldsymbol{(7,2) = \{X, \emptyset, \{c\}, \{d\}, \{a, b\}, \{c, d\}, \{a, b, d\}\}}$

$\boldsymbol{(7,3) = \{X, \emptyset, \{c\}, \{d\}, \{a, b\}, \{c, d\}, \{a, b, d\}\}}$

$\boldsymbol{(7,4) = \{X, \emptyset, \{c\}, \{d\}, \{a, b\}, \{c, d\}, \{a, b, d\}\}}$

$\boldsymbol{(7,5) = \{X, \emptyset, \{c\}\}}$

$\boldsymbol{(7,6) = \{X, \emptyset, \{a, b\}, \{a, b, d\}\}}$

$\boldsymbol{(7,8) = \{X, \emptyset, \{c\}, \{d\}, \{a, b\}, \{c, d\}, \{a, b, d\}\}}$

$\boldsymbol{(7,9) = \{X, \emptyset, \{c\}, \{d\}, \{a, b\}, \{c, d\}, \{a, b, d\}\}}$

$\boldsymbol{(7,10) = \{X, \emptyset, \{c\}, \{a, b\}, \{a, b, d\}\}}$

$\boldsymbol{(7,11) = \{X, \emptyset, \{a, b\}, \{a, b, d\}\}}$

$\boldsymbol{(7,12) = \{X, \emptyset, \{c\}, \{d\}, \{a, b\}, \{c, d\}, \{a, b, d\}\}}$

$\boldsymbol{(7,13) = \{X, \emptyset, \{c\}, \{d\}, \{a, b\}, \{c, d\}, \{a, b, d\}\}}$

VIII. $X = \{a, b, c, d\}$ $\tau_2 = \{X, \emptyset, \{a, b\}\}$

$\tau_1 = \{X, \emptyset, \{a\}\}$ $\tau_3 = \{X, \emptyset, \{a, b, c\}\}$

$\tau_4 = \{X, \emptyset, \{a\}, \{a, b\}\}$ $\tau_5 = \{X, \emptyset, \{a\}, \{c\}, \{a, b\}, \{a, c\}, \{a, b, c\}, \{a, c, d\}\}$

$\tau_6 = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$ $\tau_7 = \{X, \emptyset, \{c\}, \{a, b\}, \{a, b, c\}\}$

$\tau_8 = \{X, \emptyset, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$ $\tau_9 = \{X, \emptyset, \{a\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$

$\tau_{10} = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}\}$ $\tau_{11} = \{X, \emptyset, \{a\}, \{b, c\}, \{a, b, c\}\}$

$\tau_{12} = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$ $\tau_{13} = \{X, \emptyset, \{a, b\}, \{c, d\}\}$

$SC(X) = \tau_8 = \{X, \emptyset, \{c\}, \{d\}, \{c, d\}\}$

$\delta PO(X) = \tau_5 = \{X, \emptyset, \{a\}, \{c\}, \{a, c\}, \{b, c\}, \{a, b, c\}, \{a, c, d\}, \{b, c, d\}\}$

$\delta PO(X) = \tau_6 = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$

$\delta PO(X) = \tau_7 = \{X, \emptyset, \{a\}, \{b\}, \{c\}, \{a, b\}, \{a, c\}, \{b, c\}, \{a, b, c\}, \{b, c, d\}, \{a, c, d\}\}$

$\delta PO(X) = \tau_{10} = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$

$\delta PO(X) = \tau_{11} = \{X, \emptyset, \{a\}, \{b\}, \{c\}, \{a, b\}, \{a, c\}, \{b, c\}, \{a, b, c\}, \{a, b, d\}, \{a, c, d\}\}$

$$\delta PO(X) = \tau_1 = \tau_2 = \tau_3 = \tau_4 = \tau_9 = \tau_{12} = \tau_{13} = \mathcal{P}(X)$$

$\boldsymbol{(8, 1) = \{X, \emptyset, \{c\}, \{d\}, \{c, d\}\}}$

$\boldsymbol{(8, 2) = \{X, \emptyset, \{c\}, \{d\}, \{c, d\}\}}$

$\boldsymbol{(8, 3) = \{X, \emptyset, \{c\}, \{d\}, \{c, d\}\}}$

$\boldsymbol{(8, 4) = \{X, \emptyset, \{c\}, \{d\}, \{c, d\}\}}$

$\boldsymbol{(8, 5) = \{X, \emptyset, \{c\}\}}$

$\boldsymbol{(8, 6) = \{X, \emptyset\}}$

$\boldsymbol{(8, 7) = \{X, \emptyset, \{c\}\}}$

$\boldsymbol{(8, 9) = \{X, \emptyset, \{c\}, \{d\}, \{c, d\}\}}$

$\boldsymbol{(8, 10) = \{X, \emptyset\}}$

$\boldsymbol{(8, 11) = \{X, \emptyset\}}$

$\boldsymbol{(8, 12) = \{X, \emptyset, \{c\}, \{d\}, \{c, d\}\}}$

$\boldsymbol{(8, 13) = \{X, \emptyset, \{c\}, \{d\}, \{c, d\}\}}$

IX. $X = \{a, b, c, d\}$ $\tau_2 = \{X, \emptyset, \{a, b\}\}$

$\tau_1 = \{X, \emptyset, \{a\}\}$ $\tau_3 = \{X, \emptyset, \{a, b, c\}\}$

$\tau_4 = \{X, \emptyset, \{a\}, \{a, b\}\}$ $\tau_5 = \{X, \emptyset, \{a\}, \{c\}, \{a, b\}, \{a, c\}, \{a, b, c\}, \{a, c, d\}\}$

$\tau_6 = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$ $\tau_7 = \{X, \emptyset, \{c\}, \{a, b\}, \{a, b, c\}\}$

$\tau_8 = \{X, \emptyset, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$ $\tau_9 = \{X, \emptyset, \{a\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$

$\tau_{10} = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}\}$ $\tau_{11} = \{X, \emptyset, \{a\}, \{b, c\}, \{a, b, c\}\}$

$\tau_{12} = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$ $\tau_{13} = \{X, \emptyset, \{a, b\}, \{c, d\}\}$

$SC(X) = \tau_9 = \{X, \emptyset, \{b\}, \{c\}, \{d\}, \{b, c\}, \{b, d\}, \{c, d\}, \{b, c, d\}\}$

$\delta PO(X) = \tau_5 = \{X, \emptyset, \{a\}, \{c\}, \{a, c\}, \{b, c\}, \{a, b, c\}, \{a, c, d\}, \{b, c, d\}\}$

$\delta PO(X) = \tau_6 = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$

$\delta PO(X) = \tau_7 = \{X, \emptyset, \{a\}, \{b\}, \{c\}, \{a, b\}, \{a, c\}, \{b, c\}, \{a, b, c\}, \{b, c, d\}, \{a, c, d\}\}$

$\delta PO(X) = \tau_{10} = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$

$\delta PO(X) = \tau_{11} = \{X, \emptyset, \{a\}, \{b\}, \{c\}, \{a, b\}, \{a, c\}, \{b, c\}, \{a, b, c\}, \{a, b, d\}, \{a, c, d\}\}$

$$\delta PO(X) = \tau_1 = \tau_2 = \tau_3 = \tau_4 = \tau_8 = \tau_{12} = \tau_{13} = \mathcal{P}(X)$$

$\boldsymbol{(9,1) = \{X, \emptyset, \{b\}, \{c\}, \{d\}, \{b, c\}, \{b, d\}, \{c, d\}, \{b, c, d\}\}}$

$\boldsymbol{(9,2) = \{X, \emptyset, \{b\}, \{c\}, \{d\}, \{b, c\}, \{b, d\}, \{c, d\}, \{b, c, d\}\}}$

$\boldsymbol{(9,3) = \{X, \emptyset, \{b\}, \{c\}, \{d\}, \{b, c\}, \{b, d\}, \{c, d\}, \{b, c, d\}\}}$

$\boldsymbol{(9,4) = \{X, \emptyset, \{b\}, \{c\}, \{d\}, \{b, c\}, \{b, d\}, \{c, d\}, \{b, c, d\}\}}$

$\boldsymbol{(9,5) = \{X, \emptyset, \{c\}, \{b, c\}, \{b, c, d\}\}}$

$\boldsymbol{(9,6) = \{X, \emptyset, \{b\}\}}$

$\boldsymbol{(9,7) = \{X, \emptyset, \{b\}, \{c\}, \{b, c\}, \{b, c, d\}\}}$

$\boldsymbol{(9,8) = \{X, \emptyset, \{b\}, \{c\}, \{d\}, \{b, c\}, \{b, d\}, \{c, d\}, \{b, c, d\}\}}$

$\boldsymbol{(9,10) = \{X, \emptyset, \{b\}\}}$

$\boldsymbol{(9,11) = \{X, \emptyset, \{b\}, \{c\}, \{b, c\}\}}$

$\boldsymbol{(9,12) = \{X, \emptyset, \{b\}, \{c\}, \{d\}, \{b, c\}, \{b, d\}, \{c, d\}, \{b, c, d\}\}}$

$\boldsymbol{(9,13) = \{X, \emptyset, \{b\}, \{c\}, \{d\}, \{b, c\}, \{b, d\}, \{c, d\}, \{b, c, d\}\}}$

X. $X = \{a, b, c, d\}$ $\tau_2 = \{X, \emptyset, \{a, b\}\}$

$\tau_1 = \{X, \emptyset, \{a\}\}$ $\tau_3 = \{X, \emptyset, \{a, b, c\}\}$

$\tau_4 = \{X, \emptyset, \{a\}, \{a, b\}\}$ $\tau_5 = \{X, \emptyset, \{a\}, \{c\}, \{a, b\}, \{a, c\}, \{a, b, c\}, \{a, c, d\}\}$

$\tau_6 = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$ $\tau_7 = \{X, \emptyset, \{c\}, \{a, b\}, \{a, b, c\}\}$

$\tau_8 = \{X, \emptyset, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$ $\tau_9 = \{X, \emptyset, \{a\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$

$\tau_{10} = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}\}$ $\tau_{11} = \{X, \emptyset, \{a\}, \{b, c\}, \{a, b, c\}\}$

$\tau_{12} = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$ $\tau_{13} = \{X, \emptyset, \{a, b\}, \{c, d\}\}$

$SC(X) = \tau_{10} = \{X, \emptyset, \{a\}, \{b\}, \{c\}, \{d\}, \{a, c\}, \{a, d\}, \{b, c\}, \{b, d\}, \{c, d\}, \{a, c, d\}, \{b, c, d\}\}$

$\delta PO(X) = \tau_5 = \{X, \emptyset, \{a\}, \{c\}, \{a, c\}, \{b, c\}, \{a, b, c\}, \{a, c, d\}, \{b, c, d\}\}$

$\delta PO(X) = \tau_6 = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$

$\delta PO(X) = \tau_7 = \{X, \emptyset, \{a\}, \{b\}, \{c\}, \{a, b\}, \{a, c\}, \{b, c\}, \{a, b, c\}, \{b, c, d\}, \{a, c, d\}\}$

$\delta PO(X) = \tau_{11} = \{X, \emptyset, \{a\}, \{b\}, \{c\}, \{a, b\}, \{a, c\}, \{b, c\}, \{a, b, c\}, \{a, b, d\}, \{a, c, d\}\}$

$$\delta PO(X) = \tau_1 = \tau_2 = \tau_3 = \tau_4 = \tau_8 = \tau_9 = \tau_{12} = \tau_{13} = \mathcal{P}(X)$$

$\boldsymbol{(10,1) = \{X, \emptyset, \{a\}, \{b\}, \{c\}, \{d\}, \{a, c\}, \{a, d\}, \{b, c\}, \{b, d\}, \{c, d\}, \{a, c, d\}, \{b, c, d\}\}}$

$\boldsymbol{(10,2) = \{X, \emptyset, \{a\}, \{b\}, \{c\}, \{d\}, \{a, c\}, \{a, d\}, \{b, c\}, \{b, d\}, \{c, d\}, \{a, c, d\}, \{b, c, d\}\}}$

$\boldsymbol{(10,3) = \{X, \emptyset, \{a\}, \{b\}, \{c\}, \{d\}, \{a, c\}, \{a, d\}, \{b, c\}, \{b, d\}, \{c, d\}, \{a, c, d\}, \{b, c, d\}\}}$

$\boldsymbol{(10,4) = \{X, \emptyset, \{a\}, \{b\}, \{c\}, \{d\}, \{a, c\}, \{a, d\}, \{b, c\}, \{b, d\}, \{c, d\}, \{a, c, d\}, \{b, c, d\}\}}$

$\boldsymbol{(10,5) = \{X, \emptyset, \{a\}, \{c\}, \{a, c\}, \{b, c\}, \{b, c, d\}, \{a, b, c\}, \{a, c, d\}\}}$

$\boldsymbol{(10,6) = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}}$

$\boldsymbol{(10,7) = \{X, \emptyset, \{a\}, \{b\}, \{c\}, \{a, b\}, \{a, c\}, \{b, c\}, \{a, b, c\}, \{a, c, d\}, \{b, c, d\}\}}$

$\boldsymbol{(10,8) = \{X, \emptyset, \{a\}, \{b\}, \{c\}, \{d\}, \{a, c\}, \{a, d\}, \{b, c\}, \{b, d\}, \{c, d\}, \{a, c, d\}, \{b, c, d\}\}}$

$\boldsymbol{(10,9) = \{X, \emptyset, \{a\}, \{b\}, \{c\}, \{d\}, \{a, c\}, \{a, d\}, \{b, c\}, \{b, d\}, \{c, d\}, \{a, c, d\}, \{b, c, d\}\}}$

$\boldsymbol{(10,11) = \{X, \emptyset, \{a\}, \{b\}, \{c\}, \{a, b\}, \{a, c\}, \{b, c\}, \{a, b, c\}, \{a, b, d\}, \{a, c, d\}\}}$

$\boldsymbol{(10,12) = \{X, \emptyset, \{a\}, \{b\}, \{c\}, \{d\}, \{a, c\}, \{a, d\}, \{b, c\}, \{b, d\}, \{c, d\}, \{a, c, d\}, \{b, c, d\}\}}$

$\boldsymbol{(10,13) = \{X, \emptyset, \{a\}, \{b\}, \{c\}, \{d\}, \{a, c\}, \{a, d\}, \{b, c\}, \{b, d\}, \{c, d\}, \{a, c, d\}, \{b, c, d\}\}}$

XI. $X = \{a, b, c, d\}$ $\tau_2 = \{X, \emptyset, \{a, b\}\}$

$\tau_1 = \{X, \emptyset, \{a\}\}$ $\tau_3 = \{X, \emptyset, \{a, b, c\}\}$

$\tau_4 = \{X, \emptyset, \{a\}, \{a, b\}\}$ $\tau_5 = \{X, \emptyset, \{a\}, \{c\}, \{a, b\}, \{a, c\}, \{a, b, c\}, \{a, c, d\}\}$

$\tau_6 = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$ $\tau_7 = \{X, \emptyset, \{c\}, \{a, b\}, \{a, b, c\}\}$

$\tau_8 = \{X, \emptyset, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$ $\tau_9 = \{X, \emptyset, \{a\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$

$\tau_{10} = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}\}$ $\tau_{11} = \{X, \emptyset, \{a\}, \{b, c\}, \{a, b, c\}\}$

$\tau_{12} = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$ $\tau_{13} = \{X, \emptyset, \{a, b\}, \{c, d\}\}$

$SC(X) = \tau_{11} = \{X, \emptyset, \{a\}, \{d\}, \{a, d\}, \{b, c\}, \{b, c, d\}\}$

$\delta PO(X) = \tau_5 = \{X, \emptyset, \{a\}, \{c\}, \{a, c\}, \{b, c\}, \{a, b, c\}, \{a, c, d\}, \{b, c, d\}\}$

$\delta PO(X) = \tau_6 = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$

$\delta PO(X) = \tau_7 = \{X, \emptyset, \{a\}, \{b\}, \{c\}, \{a, b\}, \{a, c\}, \{b, c\}, \{a, b, c\}, \{b, c, d\}, \{a, c, d\}\}$

$\delta PO(X) = \tau_{10} = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$

$$\delta PO(X) = \tau_1 = \tau_2 = \tau_3 = \tau_4 = \tau_8 = \tau_9 = \tau_{12} = \tau_{13} = \mathcal{P}(X)$$

$\boldsymbol{(11, 1) = \{X, \emptyset, \{a\}, \{d\}, \{a, d\}, \{b, c\}, \{b, c, d\}\}}$

$\boldsymbol{(11, 2) = \{X, \emptyset, \{a\}, \{d\}, \{a, d\}, \{b, c\}, \{b, c, d\}\}}$

$\boldsymbol{(11, 3) = \{X, \emptyset, \{a\}, \{d\}, \{a, d\}, \{b, c\}, \{b, c, d\}\}}$

$\boldsymbol{(11, 4) = \{X, \emptyset, \{a\}, \{d\}, \{a, d\}, \{b, c\}, \{b, c, d\}\}}$

$\boldsymbol{(11, 5) = \{X, \emptyset, \{a\}, \{b, c\}, \{b, c, d\}\}}$

$\boldsymbol{(11, 6) = \{X, \emptyset, \{a\}\}}$

$\boldsymbol{(11, 7) = \{X, \emptyset, \{a\}, \{b, c\}, \{b, c, d\}\}}$

$\boldsymbol{(11, 8) = \{X, \emptyset, \{a\}, \{d\}, \{a, d\}, \{b, c\}, \{b, c, d\}\}}$

$\boldsymbol{(11, 9) = \{X, \emptyset, \{a\}, \{d\}, \{a, d\}, \{b, c\}, \{b, c, d\}\}}$

$\boldsymbol{(11, 10) = \{X, \emptyset, \{a\}\}}$

$\boldsymbol{(11, 12) = \{X, \emptyset, \{a\}, \{d\}, \{a, d\}, \{b, c\}, \{b, c, d\}\}}$

$\boldsymbol{(11, 13) = \{X, \emptyset, \{a\}, \{d\}, \{a, d\}, \{b, c\}, \{b, c, d\}\}}$

XII. $X = \{a, b, c, d\}$ $\tau_2 = \{X, \emptyset, \{a, b\}\}$

$\tau_1 = \{X, \emptyset, \{a\}\}$ $\tau_3 = \{X, \emptyset, \{a, b, c\}\}$

$\tau_4 = \{X, \emptyset, \{a\}, \{a, b\}\}$ $\tau_5 = \{X, \emptyset, \{a\}, \{c\}, \{a, b\}, \{a, c\}, \{a, b, c\}, \{a, c, d\}\}$

$\tau_6 = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$ $\tau_7 = \{X, \emptyset, \{c\}, \{a, b\}, \{a, b, c\}\}$

$\tau_8 = \{X, \emptyset, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$ $\tau_9 = \{X, \emptyset, \{a\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$

$\tau_{10} = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}\}$ $\tau_{11} = \{X, \emptyset, \{a\}, \{b, c\}, \{a, b, c\}\}$

$\tau_{12} = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$ $\tau_{13} = \{X, \emptyset, \{a, b\}, \{c, d\}\}$

$SC(X) = \tau_{12} = \{X, \emptyset, \{a\}, \{d\}, \{a, d\}, \{b, c\}, \{a, b, c\}, \{b, c, d\}\}$

$\delta PO(X) = \tau_5 = \{X, \emptyset, \{a\}, \{c\}, \{a, c\}, \{b, c\}, \{a, b, c\}, \{a, c, d\}, \{b, c, d\}\}$

$\delta PO(X) = \tau_6 = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$

$\delta PO(X) = \tau_7 = \{X, \emptyset, \{a\}, \{b\}, \{c\}, \{a, b\}, \{a, c\}, \{b, c\}, \{a, b, c\}, \{b, c, d\}, \{a, c, d\}\}$

$\delta PO(X) = \tau_{10} = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$

$\delta PO(X) = \tau_{11} = \{X, \emptyset, \{a\}, \{b\}, \{c\}, \{a, b\}, \{a, c\}, \{b, c\}, \{a, b, c\}, \{a, b, d\}, \{a, c, d\}\}$

$$\delta PO(X) = \tau_1 = \tau_2 = \tau_3 = \tau_4 = \tau_8 = \tau_9 = \tau_{13} = \mathcal{P}(X)$$

$\boldsymbol{(12, 1) = \{X, \emptyset, \{a\}, \{d\}, \{a, d\}, \{b, c\}, \{a, b, c\}, \{b, c, d\}\}}$

$\boldsymbol{(12, 2) = \{X, \emptyset, \{a\}, \{d\}, \{a, d\}, \{b, c\}, \{a, b, c\}, \{b, c, d\}\}}$

$\boldsymbol{(12, 3) = \{X, \emptyset, \{a\}, \{d\}, \{a, d\}, \{b, c\}, \{a, b, c\}, \{b, c, d\}\}}$

$\boldsymbol{(12, 4) = \{X, \emptyset, \{a\}, \{d\}, \{a, d\}, \{b, c\}, \{a, b, c\}, \{b, c, d\}\}}$

$\boldsymbol{(12, 5) = \{X, \emptyset, \{a\}, \{b, c\}, \{a, b, c\}, \{b, c, d\}\}}$

$\boldsymbol{(12, 6) = \{X, \emptyset, \{a\}, \{a, b, c\}\}}$

$\boldsymbol{(12, 7) = \{X, \emptyset, \{a\}, \{b, c\}, \{a, b, c\}, \{b, c, d\}\}}$

$\boldsymbol{(12, 8) = \{X, \emptyset, \{a\}, \{d\}, \{a, d\}, \{b, c\}, \{a, b, c\}, \{b, c, d\}\}}$

$\boldsymbol{(12, 9) = \{X, \emptyset, \{a\}, \{d\}, \{a, d\}, \{b, c\}, \{a, b, c\}, \{b, c, d\}\}}$

$\boldsymbol{(12, 10) = \{X, \emptyset, \{a\}, \{b, c\}, \{a, b, c\}\}}$

$\boldsymbol{(12, 11) = \{X, \emptyset, \{a\}, \{b, c\}, \{a, b, c\}\}}$

$\boldsymbol{(12, 13) = \{X, \emptyset, \{a\}, \{d\}, \{a, d\}, \{b, c\}, \{a, b, c\}, \{b, c, d\}\}}$

XIII. $X = \{a, b, c, d\}$ $\tau_2 = \{X, \emptyset, \{a, b\}\}$

$\tau_1 = \{X, \emptyset, \{a\}\}$ $\tau_3 = \{X, \emptyset, \{a, b, c\}\}$

$\tau_4 = \{X, \emptyset, \{a\}, \{a, b\}\}$ $\tau_5 = \{X, \emptyset, \{a\}, \{c\}, \{a, b\}, \{a, c\}, \{a, b, c\}, \{a, c, d\}\}$

$\tau_6 = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$ $\tau_7 = \{X, \emptyset, \{c\}, \{a, b\}, \{a, b, c\}\}$

$\tau_8 = \{X, \emptyset, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$ $\tau_9 = \{X, \emptyset, \{a\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$

$\tau_{10} = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}\}$ $\tau_{11} = \{X, \emptyset, \{a\}, \{b, c\}, \{a, b, c\}\}$

$\tau_{12} = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$ $\tau_{13} = \{X, \emptyset, \{a, b\}, \{c, d\}\}$

$SC(X) = \tau_{13} = \{X, \emptyset, \{a, b\}, \{c, d\}\}$

$\delta PO(X) = \tau_5 = \{X, \emptyset, \{a\}, \{c\}, \{a, c\}, \{b, c\}, \{a, b, c\}, \{a, c, d\}, \{b, c, d\}\}$

$\delta PO(X) = \tau_6 = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$

$\delta PO(X) = \tau_7 = \{X, \emptyset, \{a\}, \{b\}, \{c\}, \{a, b\}, \{a, c\}, \{b, c\}, \{a, b, c\}, \{b, c, d\}, \{a, c, d\}\}$

$\delta PO(X) = \tau_{10} = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}, \{a, b, c\}, \{a, b, d\}\}$

$\delta PO(X) = \tau_{11} = \{X, \emptyset, \{a\}, \{b\}, \{c\}, \{a, b\}, \{a, c\}, \{b, c\}, \{a, b, c\}, \{a, b, d\}, \{a, c, d\}\}$

$$\delta PO(X) = \tau_1 = \tau_2 = \tau_3 = \tau_4 = \tau_8 = \tau_9 = \tau_{12} = \mathcal{P}(X)$$

$\boldsymbol{(13, 1) = \{X, \emptyset, \{a, b\}, \{c, d\}\}}$

$\boldsymbol{(13, 2) = \{X, \emptyset, \{a, b\}, \{c, d\}\}}$

$\boldsymbol{(13, 3) = \{X, \emptyset, \{a, b\}, \{c, d\}\}}$

$\boldsymbol{(13, 4) = \{X, \emptyset, \{a, b\}, \{c, d\}\}}$

$\boldsymbol{(13, 5) = \{X, \emptyset\}}$

$\boldsymbol{(13, 6) = \{X, \emptyset, \{a, b\}\}}$

$\boldsymbol{(13, 7) = \{X, \emptyset, \{a, b\}\}}$

$\boldsymbol{(13, 8) = \{X, \emptyset, \{a, b\}, \{c, d\}\}}$

$\boldsymbol{(13, 9) = \{X, \emptyset, \{a, b\}, \{c, d\}\}}$

$\boldsymbol{(13, 10) = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}\}}$

$\boldsymbol{(13, 11) = \{X, \emptyset, \{a\}, \{b\}, \{a, b\}\}}$

$\boldsymbol{(13, 12) = \{X, \emptyset, \{a, b\}, \{c, d\}\}}$

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1. **Vidhyapriya P**, Shanmugapriya H and **Sivakamasundari K**, δP_S-Open Sets in Topological Spaces, *AIP Conference Proceedings* 2261, 030103 (2020), (SCOPUS Indexed Journal).
2. **Vidhyapriya P**, Shanmugapriya H and **Sivakamasundari K**, δPs-Continuity and Decomposition of Perfect Continuity and Complete Continuity, *Indian Journal of Natural Sciences* 12(65), 30484-30495, April (2021), **(Web of Science).**
3. Shanmugapriya H, **Vidhyapriya P and Sivakamasundari K,** A New Operation Approach in Topological Spaces, *Indian Journal of Natural Sciences*, 12(65), 30529-30539, (140-150) April (2021) **(Web of Science).**
4. **Vidhyapriya P** and **Sivakamsundari K,** "A New Class of Open sets using δ-preopen sets", *International Journal of Engg., Sci., and Mathematics*, 10(10) 2021.
5. **Vidhyapriya P** and **Sivakamasundari K**, Various Types of Somewhat Continuity using δP_S-functions, *Indian Journal of natural Sciences*,12(69), 36334-36345, December 2021 **(Web of Science).**
6. **Vidhyapriya P** and **Sivakamasundari K**, Almost δP_S-continuous Functions, Advances and Applications in Mathematical Sciences, Mili Publications (Accepted – Web of Science).
7. **Vidhyapriya P** and **Sivakamasundari K**, Weakly δP_S-continuous Functions, (Communicated).
8. **Vidhyapriya P** and **Sivakamasundari K**, Contra δPs-Continuous Functions (Accepted in African Journal of Research in Mathematics, Science and Technology Education – SCOPUS Indexed).
9. **Vidhyapriya P** and **Sivakamasundari K**, Properties of δPs-Open Sets (Communicated)
10. **Vidhyapriya P** and **Sivakamasundari K**, Applications of a δP_S-open set in Bitopological Spaces (Communicated).