

SETS AND RELATIONS

- * No. of subsets of $S = 2^n$
- 1) No. of ordered subsets = $2^n \times 2^n = 4^n$
- 2) No. of unordered subsets = $\frac{4^n - 2^n}{2} + 2^n$
- 3) No. of proper subsets = $2^n - 1$
- * Power set $\rightarrow$ Collection of all subsets

* No. of relations from A to $B = 2^{pq}$

Reflexive ($A \rightarrow A$)

If $(a, b) \in R$ then $(a, a) \in R$ must $\in R$

Symmetric ($A \rightarrow A \cup B$)

If $(a, b) \in R$ then (b, a) must $\in R$

Transitive (a, b)

(b, c) DNE

then

transitive $\checkmark$

(b, c) exists

then (a, c) must
exist then only
transitive $\checkmark$

Equivalence: All $R, S \in T$

No. of relations

Reflexive $2^{n^2 - n}$

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

Equivalence

1

1 2

2 3 5

5 7 10 15

15 20 27 37 52

Bell's

Number

203