CS & IT ENGINEERING

Discrete Mathematics

Set Theory

DPP 08 Discussion notes

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01 Question

02 Discussion

Q.1 Let (A, R) be a poset, then the number of below statements that are false is? **[NAT]**

I. If (A, R) is a lattice, then it is a total order (false)

II. If (A, R) is a total order, then it is a lattice. (True)

Ans: 1.

lattice

Q.2

If (A, R) is a lattice, with A finite, then (A, R) has:

[MCQ]

A. Only greatest element.

B. Only least element.

C. A greatest element and a least element.

D. None of these

Q.3 Let M (R) be the relation matrix for relation R on A, with $|A| = n$. If (A, R) is total order, then the number of 1's appear in M(R) [MCQ]

A. $n+\binom{n}{2}$ ✓

B. $\frac{n+1}{2}$

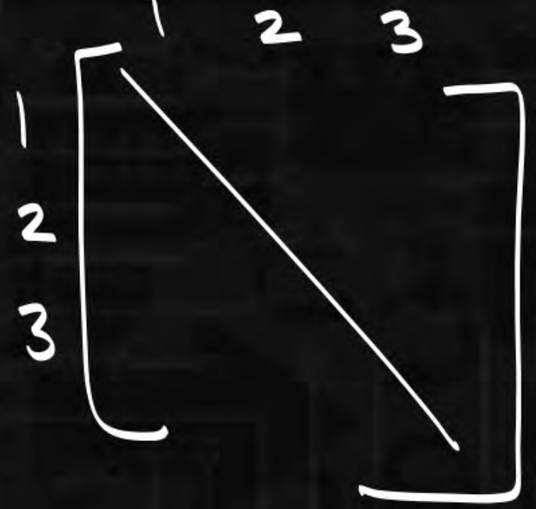
C. $\frac{n-1}{2}$

D. $2+\binom{n}{2}$

11 22 33 | 12 13 23

n | $^nC_2$

$n + {}^nC_2$.



n

Q.4 Let $D_{30} = \{1,2,3,5,6,10,15, 30\}$ and let the relation '|' be a partial ordering on D_{30}. The greatest lower bound of 10 and 15 is? **[MCQ]**

A. 3

B. 1

C. 5 ✓

D. 6

$$gcd(10,15)$$

$$= 5$$

Q.5 For U = {1, 2, 3}, Let A = P (U). Define the relation R on A by B R C if $B \subseteq C$. How many ordered pairs are there in the relation R? [MCQ]

A. 24

B. 25

C. 26

D. 27

$B \subseteq C \subseteq U$

$B \subseteq C \subseteq 3$

$C \subseteq 3$

$C = \{12\}$

$\phi \subseteq \{12\}$

$\{1\} \subseteq \{12\}$

$\{2\} \subseteq \{12\}$

$\{12\} \subseteq \{12\}$

$3C_2 \times 2^2$

$3C_3 \cdot 2^3$ 123

$3C_2 \cdot 2^2$ 12 13 23

$3C_1 \cdot 2^1$ 1 2 3

$3C_0 2^0$ ϕ

$$3C_0 \cdot 2^0 + 3C_1 \cdot 2^1 + 3C_2 \cdot 2^2 + 3C_3 \cdot 2^3 = 3^3 = 27.$$

$$\sum_{i=0}^{3} 3C_i \cdot 2^i = (2+1)^3 = 3^3 = 27.$$


THANK YOU GW
SOLDIERS !