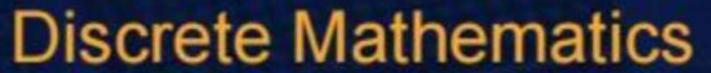
CS & IT





Combinatorics

DPP 04 Discussion



SATISH YADAV SIR





TOPICS TO BE COVERED

01 Question

02 Discussion

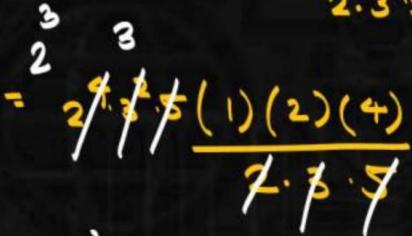
Q.1

If ϕ is Euler phi function then $\phi(\phi(1001))$ is



$$\phi(\phi(1001))$$
 720=89.10
= 23.32.2.5

$$\phi(1001) = \phi(13) \times \phi(7) \times \phi(11)$$
= $\phi(13) \times \phi(7) \times \phi(11)$



$$= 12 \times 6 \times 10$$

= $= +20$

Q.2

Consider the Euler's phi function given by



$$\phi(n) = n\pi_{p/n} \left(1 - \frac{1}{p} \right)$$

Where p runs over all the primes dividing n. What is the value of

$$\phi(45)$$
?

$$\frac{3}{3} \frac{5(3)(4)}{3.5} = 3.2.4 = 24$$

How many numbers in {1, 2,..., 200} are coprime to 100? [NAT]



80)



$$\phi(100) = \phi(2^{2}.5^{2})$$

$$100 = 25 \times 4$$

$$= 100(2-1)(5-1)$$

$$= 2^{2}.5^{2}$$

$$= 2^{2}.5^{2}$$

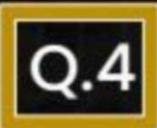
$$= 2^{2}.5^{2}$$

$$= 2^{2}.5^{2}$$

$$= 2^{2}.5^{2}$$

$$= 10.4 = 40$$

$$(q(d(1,100) \pm q(d(101,100)))$$
 $(d(2,100) \pm q(d(102,100)))$
 $(d(2,100) \pm q(d(102,100)))$
 $(d(2,100) \pm q(d(102,100)))$



Find the number of positive integers $n \le 6000$ such that gcd(n, 6000) = 1.



$$\phi((6000) = 6000(2-1)(3-1)(5-1)$$

$$\frac{3}{3} = \frac{5^{2}}{2 \cdot 5} \cdot \frac{5}{5}$$

$$= \frac{3}{3} \cdot \frac{5^{2}}{5} \cdot \frac{(1)(2)(4)}{(1)(2)(4)}$$

$$= \frac{3}{3} \cdot \frac{5^{2}}{5} \cdot \frac{3}{5} \cdot \frac{3}{5}$$

$$= \frac{3}{3} \cdot \frac{5^{2}}{5} \cdot \frac{3}{5} \cdot$$

Let $\phi(n)$ be the Euler's totient function. What is



$$= \frac{\phi(\mp \times 1)}{\phi(1-)} = \frac{\phi(\mp) \times \phi(1-)}{\phi(1-)}$$

$$= \phi(\mp) = \mp -1 = 6$$



