Sai Ram
20181CSE0621

classmate
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Sai Ram. k
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Part-B

Q.1] **Euler Totient Function:**

The Euler totient function counts the positive integers upto a given integer n. It is denoted by 'ϕ' & also called 'Euler phi function.

- If n is a prime number,

$$\phi(n) = n-1$$

- $\phi(a*b) = \phi(a) * \phi(b)$

if a & b are co-prime.

——> Given, $n = 14$

- To calculate $\phi(14)$, we find two numbers such that they are co-prime.
- Let the two numbers be $a=2$ and $b=7$.
We know that $\gcd(2,7) = 1$.
This implies that they are co-prime.
∴ 2, 7 are co prime.
- Now we can write the function as
$\phi(14) = \phi(2) * \phi(7)$
Applying property $\phi(n) = n-1$ for n being prime

$$\phi(14) = (2-1) \times (7-1)$$
$$= 1 \times 6$$

$$\therefore \phi(14) = 6$$