

$A, B \rightarrow$ square matrices.

Q

$$AB = A + B, \quad A^{2022} = 0$$

$$|B| = ?$$

Soln

$$A^{2022} = 0$$

$$|A^{2022}| = |0|$$

$$|A|^{2022} = 0$$

$$\left\{ |A^n| = |A|^n \right\}$$

$$\boxed{|A| = 0}$$

$$AB = A + B$$

$$AB - A = B$$

$$A(B - I) = B$$

$$|A \cdot (B - I)| = |B|$$

$$|A| \cdot |B - I| = |B|$$

$$\boxed{|B| = 0}$$

$$\left\{ \because |A| = 0 \right\}$$

Ans.