If A, B, C are given square matrices of same order such that $AB = O$ & $BC = I$. Then $(A + B)^2(A + C)^2$ is equal to:

Solution : $BC = I$, pre multiplying by A

$$ABC = AI \qquad (\because AB = O)$$

$$\Rightarrow O = A$$

$$(A + B)^2(A + C)^2 = (B)^2(C)^2$$

$$= BBCC$$

$$= BIC$$

$$= BC$$

$$\Rightarrow (A + B)^2\ (A + C)^2 = I$$

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