Matrices and Determinants - Class XII

Related Questions with Solutions

Questions

Quetion: 01

If A is a symmetric and B skew symmetric matrix and A + B is non-singular and $C = (A+B)^{-1}(A-B)$ then
$C^{\top}(A+B)C =$

A. A + B

B. A – B

C. A

D. B

Solutions

Solution: 01

$(A+B)C = (A+B)(A+B)^{-1}(A-B) \Rightarrow \quad (A+B)C = A-B$ .....[1]

$C^{\top} = (A-B)^{\top}\left((A+B)^{-1}\right)^{\top}$

$= (A+B)\left((A+B)^{\top}\right)^{-1}\{as|A+B| \neq 0 \Rightarrow \left|(A+B)^{\top}\right| \neq 0 \quad \Rightarrow \quad |A-B| \neq O\}$

$= (A+B)(A-B)^{-1} \quad \ldots.(2)$

[1] &(2) $C^{\top}(A+B)C = (A+B)(A-B)^{-1}(A-B)$

= [A + B]

Correct Options

Answer:01

Correct Options: A