Related Questions with Solutions

Questions

Quetion: 01

Let *A* and *B* be two symmetric matrices of order 3.
Statement-1 : *A*(*BA*) and (*AB*)*A* are symmetric matrices.
Statement-2 : *AB* is symmetric matrix if matrix multiplication of *A* with *B* is commutative.

A. Statement-1 is true, Statement-2 is false.

B. Statement-1 is false, Statement-2 is true.

C. Statement-1 is true, Statement-2 is true; Statement-2 is a correct explanation for Statement-1.

D. Statement-1 is true, Statement-2 is true; Statement-2 is not a correct explanation for Statement-1.

Solutions

Solution: 01

Let $A(BA) = P$
Then $P^T = (ABA)^T = A^T B^T A^T$
$= ABA = P$
Thus, *P* is symmetric.
Also, *A*[*BA*] = [*AB*]*A* by associativity.
$\Rightarrow$ Statement -1 is true.
Now, $(AB)^T = B^T A^T = BA = AB$ if the matrices A and B commute.
$\Rightarrow$ Statement-2 is also true.

Correct Options

Answer:01
Correct Options: D