

# RATISH KUMAR

## Exercise 5

If  $Q_1$  and  $Q_2$  are orthogonal matrices then  $Q_1 \cdot Q_2$  is also orthogonal matrices.

We know that  $Q$  is orthogonal then  $Q^T Q = I$  matrices.

Let  $Q_1$  and  $Q_2$  are orthogonal and  $Q_1 Q_2$  is also orthogonal

Proof  $(Q_1 Q_2)^T Q_1 Q_2 = I$

$$= Q_1^T Q_2^T Q_1 Q_2 =$$

$$= Q_1^T Q_1 Q_2^T Q_2$$

$$= I Q_2^T Q_2$$

$$= I \cdot I$$

$$= I$$

Proved