

3. What will be the projection of vector $\vec{A} = \hat{i} + \hat{j} + \hat{k}$ on vector $\vec{B} = \hat{i} + \hat{j}$? [July 22, 2021 (II)]

- (a) $\sqrt{2}(\hat{i} + \hat{j} + \hat{k})$ (b) $2(\hat{i} + \hat{j} + \hat{k})$
(c) $\sqrt{2}(\hat{i} + \hat{j})$ (d) $(\hat{i} + \hat{j})$

ans (d) Projection of vector \vec{A} on vector \vec{B} is given by

$$(A \cos \theta) \hat{B} = A \left(\frac{\vec{A} \cdot \vec{B}}{AB} \right) \hat{B} = \frac{\vec{A} \cdot \vec{B}}{B} \hat{B}$$
$$= \frac{2}{\sqrt{2}} \left(\frac{\hat{i} + \hat{j}}{\sqrt{2}} \right) = \hat{i} + \hat{j}$$