

IMPORTANT QUESTIONS:

Q1. What are vector and Scalar quantities? (1993)

Q2. Define (i) unit vector (1997) (2005) (ii) Null vector (1997)
(iii) Position vector (2005) (iv) Free vector

Q3. Describe the addition of vectors by rectangular components method:
(1995, 1998, 2000, 2002 P.E, 2004, 2004 supp, 2006, 2008, 2013)

OR

Two force F_1 and F_2 are acting on a point making angles θ_1 and θ_2 with positive x-axis respectively. Derive the expressions for the magnitude of the resultant force and its direction with respect to the positive x-axis. (2011)

Q4. Define Scalar product of two vectors. What are the properties of scalar product? Give at least one example of scalar product.
(1992, 1999, 2001, 2004 Failures, 2002 supp, 2005 Failures)

Q5. Explain commutative and distributive law for dot product.
(1994, 1999, 2001, 2003 P.E, 2004 supp. 2002 supp.)

Q6. If $\vec{A} = A_1 \hat{i} + A_2 \hat{j} + A_3 \hat{k}$ and $\vec{B} = B_1 \hat{i} + B_2 \hat{j} + B_3 \hat{k}$
prove that $\vec{A} \cdot \vec{B} = A_1 B_1 + A_2 B_2 + A_3 B_3$ (1994)

Q7. Define vector product of two vectors.
(1995, 2003, P.M, 2004 Failures, 2003 Failures, 2001 Failures) (2005)

Q8. Show that $\vec{A} \times \vec{B} = -(\vec{B} \times \vec{A})$.
(1995, 1999, 2002, P.M, 2003 P.M, 2003 Failures, 2001 Failures, 2009, 2010, 2012)

Q9. If \vec{A} and \vec{B} represent the adjacent sides of a parallelogram. Show that
 $|\vec{A} \times \vec{B}| = \text{Area of parallelogram.}$ (2000, 2005, 2010, 2012)

Q10. Show that $|\vec{A} \times \vec{B}|^2 + (\vec{A} \cdot \vec{B})^2 = A^2 B^2$.
(1998, 2013)

Q11. Define vector product. Show that $\vec{A} \cdot (\vec{B} + \vec{C}) = \vec{A} \cdot \vec{B} + \vec{A} \cdot \vec{C}$
(2007, 2009, 2012)