

APOLLO

Vectors

FBISE Physics Class 11 (HSSC-I)

Domain B: Mechanics

30 questions | questions

Original FBISE question crops. National Curriculum 2022-23 topic.

4.	The direction of the vector $\vec{A} = 3\hat{i} + 4\hat{j}$ relative to the x-axis is approximately:	30°	37°	41°	53°
----	--	-----	-----	-----	-----

9.	The equation $ \mathbf{A} \cdot \mathbf{B} = \mathbf{A} \times \mathbf{B} $ is consistent when angle between vectors $\mathbf{A}$ and $\mathbf{B}$ is:	30°	45°	60°	90°	☐ ☐ ☐ ☐
----	--	-----	-----	-----	-----	---

1	Using commutative property, distinguish between scalar product and vector product of two vectors. Give mathematical justifications for both.	2+2
---	--	-----

Verify that: $(\vec{A} \cdot \vec{B})^2 + (\vec{A} \times \vec{B})^2 = (AB)^2$	03
--	----

Q.3 State and explain vector product with an example. Also show that $\vec{A} \times \vec{B} \neq \vec{B} \times \vec{A}$		
		3+4

(iii)	Under what condition the rectangular (perpendicular) components of a vector have same magnitude?	03
-------	--	----

OR	Find the power delivered by an engine for attaining velocity $= (4\hat{i} + 5\hat{j})$ m/s while it exerts a force $= (8\hat{i} - 2\hat{j})$ N.	03
----	---	----

OR	State the characteristics of vector product.	03
----	--	----

OR	Find the power delivered by the engine for attaining velocity (2,3) m/s, while it exerts a force (7,-3) N.	2+1
----	--	-----

(ii)	What is meant by dot product of two vectors? Give mathematical expression and one example.	1x3
------	--	-----

OR	Describe any three properties of cross product of two vectors.	1x3
----	--	-----

(iii)	Show that: $\vec{A} \cdot \vec{B} = A_x B_x + A_y B_y + A_z B_z$	03
-------	--	----

OR	Find the area of the parallelogram whose adjacent sides are given by the vectors: $A = (\hat{i} + 6\hat{j} + 2\hat{k})m$ and $B = (7\hat{i} + \hat{j} + 5\hat{k})m$.	
----	---	--

(i)	Deduce the dimensions of universal gravitational constant (G). $\left(F = G \frac{m_1 m_2}{r^2}\right)$	03	OR	Describe any three properties of dot product of two vectors.	1x3
-----	---	----	----	--	-----

(iii)	The magnitudes of dot and cross product of two vectors are $6\sqrt{3}$ and 6 respectively. Find the angle between the vectors.	03	OR	How a seismometer uses electromagnetic induction to detect earthquakes? Explain briefly.	03
(iv)	In a science experiment a 3.00 kg water rocket is			Find the power delivered by the engine for attaining	

03	OR	Find the power delivered by the engine for attaining velocity $(3,4) \text{ ms}^{-1}$ while it exerts a force $(8, -2) \text{ N}$.
----	----	---

xvii.	When $F_x = 3 \text{ N}$ and $F = 5 \text{ N}$ then $F_y =$	6N	8N	2N	4N	☐	☐	☐	☐
-------	---	----	----	----	----	-----------------------	-----------------------	-----------------------	-----------------------

(i)	An equation is dimensionally correct. Does it mean that equation is necessary	03	OR	Find cross product of two unit vectors at 0° and 90° .	03
-----	---	----	----	--	----

(iii)	Write the characteristics of scalar product.	03
-------	--	----

First Annual 2025 | Section A Q3 | 1 mark

3.	A force of 10 N makes an angle of 30° with x- axis. The magnitude of x- component is:	5 N	8.66 N	10 N	Zero N	☐
----	---	-----	--------	------	--------	-----------------------

First Annual 2025 | Section A Q4 | 1 mark

4.	Resultant of two forces 20N and 50N acting simultaneously on a body CANNOT be:	20 N	30 N	40 N	70 N
----	--	------	------	------	------

First Annual 2025 | Section B Q2(ii) | 3 marks

Show that:	$ \vec{A} \times \vec{B} ^2 + \vec{A} \cdot \vec{B} ^2 = A^2 B^2$	03
------------	--	----

First Annual 2025 | Section B Q2(v) OR | 3 marks

The magnitude of dot and cross product of two vectors are $6\sqrt{3}$ and 6 respectively. Find the angle between two vectors?

First Annual 2025 | Section C Q3 | 7 marks

Explain scalar or dot product of two vectors with at least two examples and four properties.
--

First Annual 2025 | Section C Q3 OR | 7 marks

How can resultant of two or more vectors be obtained by their rectangular components?

Second Annual 2025 | Section B Q2(ii) | 3 marks

(ii)	Describe the head-to-tail rule for vector addition with a simple diagram.	2+1
------	---	-----

Second Annual 2025 | Section C Q4 | 6 marks

Q.4	Explain Scalar or Dot Product with at least four properties and two examples.	06
-----	---	----

Second Annual 2025 | Section C Q5 OR | 7 marks

OR	Describe vector addition by rectangular components with the help of a diagram. Determine the relations for magnitude of resultant vector and its direction. How is its final angle calculated?	07
----	--	----

First Annual 2026 | Section B Q2(i) OR | 3 marks

A peddler is pushing a trolley on a horizontal road with a force of 50 N making 30° with the road. Find the horizontal and vertical components of force?	1.5 + 1.5
--	-----------------

OR	Briefly explain vector product of 2 vectors. Give one example.	2+1
	Briefly explain angular velocity and angular	1.5