Step Academy official

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STUDENT NAME	
PAPER CODE	39270
TIME ALLOWED	60
Paper Date	14-02-2026

CLASS	New 1st Year (FSC/ICS)
SUBJECT	Mathematics
TOTAL MARKS	25
Paper Type	

Q1. Choose the correct answer. **5X1=5**

1. Which of the following is a vector?

(A) Time **(B)** Work **(C)** Density **(D)** Electric field

2. if $2\underline{i}+a\underline{j}+5\underline{k}$ and $3\underline{i}+\underline{j}+a$ are perpendicular, then a=.....:

(A) 0 **(B)** 1 **(C)** -1 **(D)** 2

3. $\hat{i}\times\hat{k}=$:

(A) 0 **(B)** $\hat{j}$ **(C)** $-\hat{j}$ **(D)** 1

4. The vectors $\underline{a}.\underline{b}$ and $\underline{c}$ are said to be coplanar is $(\underline{a}.\underline{b} \times \underline{c})=$

(A) 1 **(B)** 0 **(C)** 2 **(D)** ab

5. The moment of force $\underline{F}$ acting at p about c is:

(A) $\underline{F} \times \underline{CP}$ **(B)** $\underline{CP} \times \underline{F}$ **(C)** $\underline{CP}.\underline{F}$ **(D)** $\underline{OP} \times \underline{F}$

Q2. write the answers of following questions. **5X2=10**

1 . For the vectors, $\underline{u}=[1,-2,3]$, $\underline{v}=[2,1,3]$ and $\underline{w}=[-1,4,0]$, find the following: $|\underline{v}-2\underline{w}|$

2 . Find a real number a so that the vectors $\underline{u}$ and $\underline{v}$ are perpendicular: $u=a\underline{i}+2a\underline{j}-\underline{k}$, $\underline{v}=\underline{i}+a\underline{j}+3\underline{k}$

3 . If the cross product of the vectors $u= 7\underline{i}-4\underline{j}+5\underline{k}$ and $\underline{v}=a\underline{i}-b\underline{j}+3\underline{k}$ is zero then find the values of a and b.

4 . Use the definition of cross product, for any vectors $\underline{u},\underline{v},\underline{w}$ and scalar k, prove that: $\underline{u} \times (\underline{v}+\underline{w})=(\underline{u} \times \underline{v}) + (\underline{u} \times \underline{w})$

5 . A force $\vec{F}=6\underline{i}+4\underline{j}-4\underline{k}$ is applied at the point A(1,-1,2). Find the moment of the force about the point B(3,-2,3).

Q3. write the answers of following questions. **2X5=10**

1 . If $u=2\underline{i}-\underline{j}+\underline{k}$ and $\underline{v}=4\underline{i}+2\underline{j}-\underline{k}$, find by determinant formula: $\underline{v} \times \underline{u}$

2 . Prove that: $\underline{a} \times(\underline{b}+\underline{c})+\underline{b}\times(\underline{c}+\underline{a})+\underline{c} \times(\underline{a}+\underline{b})=\underline{0}$