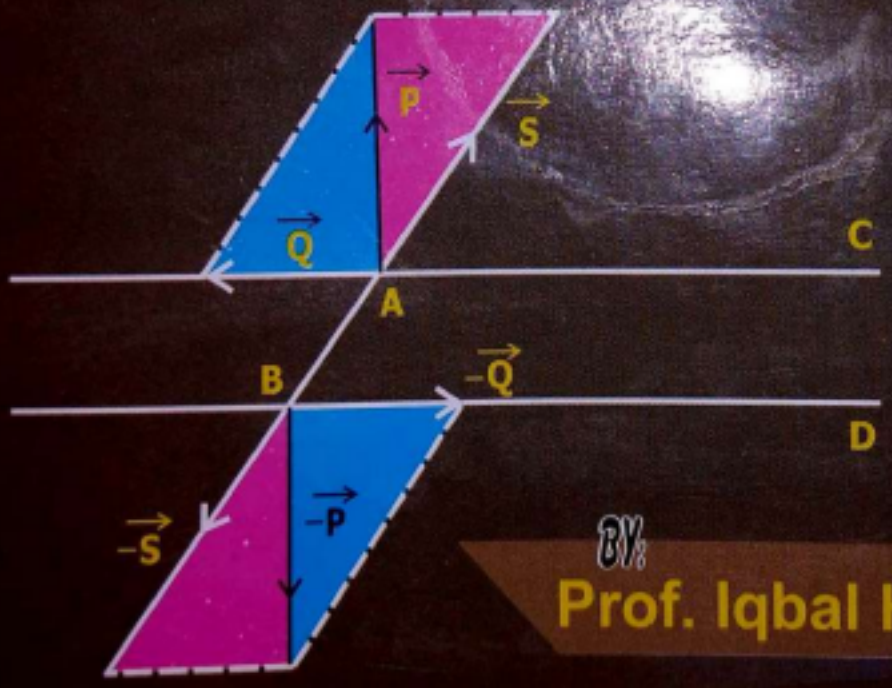
Advance

New Edition

MECHANICS

for

B.Sc & B.S (Hons.)



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اے کورس، بی کورس، جنرل کورس

کے 7 سالہ پرچہ جات

عارف سنز کی کتاب

Vector Analysis

کے ساتھ مفت حاصل کریں۔

CONTENTS

CHAPTER 1

COMPOSITI OF FORC

MECHANICS:

The Science of force and motion is called mechanics. OR

The study of force and their effects on objects is called mechanics. It has two main bran

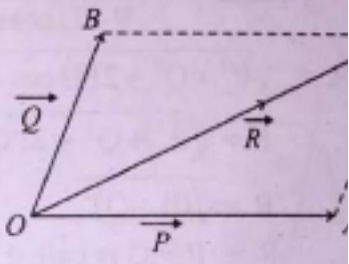
(i) Statics (ii) Dynamics

(i) STATICS: It is the branch of mechanics which deals with bodies at rest that m zremains in Equilibrium under the action of forces.

(ii) DYNAMICS: It is the branch of mechanics which deals with bodies in motion.

Components of a Force:

Let two force $\vec{P} = \vec{OA}$ and $\vec{Q} = \vec{OB}$ are acting at a point O. Now complete a ||gram OACB. Then by ||gm law of forces their resultant is completely represented in magnitude & direction by the diagonal of ||gram as shown in fig.



Let $\vec{OC} = \vec{R}$

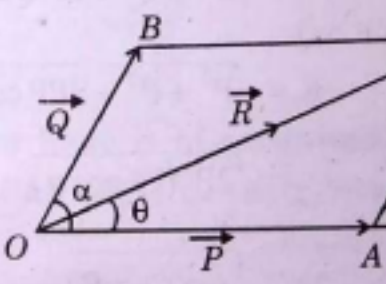
$\vec{R} = \vec{P} + \vec{Q}$

Then $\vec{P}$ & $\vec{Q}$ are called component of a force $\vec{R}$ & $\vec{R}$ is called as the resultant of $\vec{P}$ &

THEOREM: Find the magnitude of the resultant of two forces $\vec{P}$ & $\vec{Q}$ act certain angle.

Proof:

Let two forces $\vec{P} = \vec{OA}$, $\vec{Q} = \vec{OB}$ are acting at the point O. Let α is the angle between them.



Now complete a ||gram OACB then by ||gram law of forces $\vec{R} = \vec{P} + \vec{Q}$

Where $\vec{R} = \vec{OC}$

Now we want to find the magnitude of $\vec{R}$

For that draw |CL| ⊥ on |OA| then from fig, we can see that ΔOLC is a right angle Δ by pathagorus theorem.

$$|\vec{OC}|^2 = |\vec{OL}|^2 + |CL|^2$$

$$|\vec{OC}|^2 = \left(|\vec{OA}| + |AL|\right)^2 + |\vec{CL}|^2 \quad \text{.....(1)}$$

$$P = |\vec{OA}| \quad \text{.....(2)}$$

From Δ ALC, $\frac{|AL|}{|AC|} = \cos\alpha$ But $|AC| = Q$

$$|AL| = Q\cos\alpha \quad \text{..... (3)}$$