AAFAQ ACADEMY – KASUR

Paper: Physics **Chapter (2)1** **Class: F.Sc. Part – I**

VECTORS AND EQUILIBRIUM

Name: _____ Roll No: (in words) _____

EVENING GROUP

OBJECTIVE TYPE

Total Marks: 11 **Paper Code: _____** **Total Time: 10 Minutes**

NOTE: Write your **Roll No.** in space provided. Using lead pencil will result in loss of marks.

Q.No.1: You have four choices for each objective type question as A,B,C and D. The choice which you think is correct; fill that circle in front of that question number. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero mark in that question.

Sr. No.	QUESTION	A	B	C	D
1.	The torque of a force $\vec{F} = -3\hat{i} + \hat{j} + 5\hat{k}$ acting at point $\vec{r} = 7\hat{i} + 3\hat{j} + \hat{k}$	$14\hat{i} + 38\hat{j} + 16\hat{k}$	$4\hat{i} + 4\hat{j} + 6\hat{k}$	$-21\hat{i} + 4\hat{j} + 4\hat{k}$	$-14\hat{i} + 34\hat{j} - 16\hat{k}$
2.	The minimum number of unequal forces whose vector sum can be zero	Three	One	Two	Four
3.	Two forces act together on an object. The magnitude of their resultant is least when angle between them	0^0	60^0	90^0	180^0
4.	If a force of 50 N is acting along x-axis, then its components along y-axis will be	Same	Half of the magnitude	Zero	None of these
5.	Torque is also known as	Moment of inertia	Moment of force	Angular velocity	Moment arm
6.	If 2 and 2 are x and y-components of a vector, then its angle with x-axis is	30^0	45^0	60^0	90^0
7.	The projection of $\vec{B}$ on $\vec{A}$ is	$\frac{\vec{A} \cdot \vec{B}}{A}$	$\frac{\vec{A} \cdot \vec{B}}{B}$	$\frac{\vec{A} \cdot \vec{B}}{AB}$	$\vec{A}.\vec{B}$
8.	If the angle between two vectors with magnitudes 2 and 5 is 30° then their scalar product is	$5\sqrt{3}$	$\sqrt{5}$	$5\sqrt{2}$	$2\sqrt{5}$
9.	If the vectors $2\hat{i} + 4\hat{j} - 7\hat{k}$ and $2\hat{i} + 6\hat{j} + x\hat{k}$ are perpendicular, then x = _____	5	4	2	1
10.	Centre of gravity of a body lies	On the surface of the body	Inside a body	Outside a body	May be inside or outside of the body
11.	$\frac{\vec{A} \bullet \vec{A}}{\vec{A} \times \vec{A}}$ is equal to	Zero	Undefined	A	A^2

SUBJECTIVE TYPE

Total Marks: 29 **Time Allowed: 0 Hours 50 Minutes**

SECTION – I (SHORT QUESTIONS)

2. Attempt any FIVE questions. (5×2=10)Marks

i. How would the two vectors of the same magnitude have to be oriented if they were to be combined to given a resultant equal to a vector of the same magnitudes?

ii. Can a body rotate about it centre of gravity under the action of its weight?

iii. Define equilibrium and state two condition of equilibrium.

iv. Can a body rotate about its centre of gravity under the action of its weight?

v. Give the drawbacks to use the period of a pendulum as time standard.

vi. Prove that $\left|\vec{a} \times \vec{b}\right|$ represents area of a parallelogram.

vii. Name the three different conditions that could make $\vec{A}_1 \times \vec{A}_2 = 0$.

SECTION – II (ESSAY TYPE) Attempt given question

3. Do as directed...

i. What is scalar product of two vectors? Explain it in detail. Also give two properties of cross product of two vectors. (5)

ii. Two particles are located at $\vec{r}_1 = 3\hat{i} + 7\hat{j}$ and $\vec{r}_2 = -2\hat{i} + 3\hat{j}$ respectively .Find both magnitude and direction of $\vec{r}_2 - \vec{r}_1$. (3)

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SECTION – II (Practical)

4. (a)Write answer of TWO questions. (2×2=4)

i. What are the uses of vernier calipers?

ii. When is the zero error positive in a vernier calipers.

iii. What is zero error?

iv. Mention various instruments in which vernier calipers is used.

4. (b) Write procedure to determine the volume of cylinder by using vernier calipers. (3)

4. (c) Answer the following questions on the basis of graph drawn between natural numbers (N) and their reciprocals ($\sqrt{N}$). (4)

i. What you conclude from the graph?

ii. Find the value of $\sqrt{3 \bullet 7}$ from the graph.

Good Luck

Ch. Khalid Mahmood Ashraf

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