AAFAQ ACADEMY – KASUR

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

VECTORS AND EQUILIBRIUM

Name: _____ **Roll No: (in words)** _____

MORNING 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.	A couple acting on the body will only	Vibrate the body about certain axis	Keep the body stationary	Rotate the about certain axis	Accelerate the body
2.	A force passing through the centre of gravity of body produces	Translational motion	Rotational motion	Vibrational motion	None of these
3.	Dot product of two vectors is positive if angle between them is	$0^0 \prec \theta \prec 90^0$	$\theta = 90^0$	$\theta \succ 90^0$	$\theta \succ 180^0$
4.	If a vector $\vec{C}$ makes an angle θ with X – axis, then its scalar projection on Y – axis is	$CCos\theta$	$CSin\theta$	$C\tan\theta$	$CSec\theta$
5.	A unit vector perpendicular to $\vec{A}$ and $\vec{B}$ is	$\frac{\vec{A}\times\vec{B}}{AB}$	$\frac{\vec{A}\times\vec{B}}{ABCos\theta}$	$\frac{\vec{A}\times\vec{B}}{ABSin\theta}$	$\frac{\vec{A}\times\vec{B}}{Sin\theta}$
6.	A vector perpendicular to $\vec{A}=3\hat{i}-8\hat{j}$ and $\vec{B}=5\hat{i}+8\hat{j}$ is along	X – axis	Y – axis	Z – axis	Negative X – axis
7.	Magnitude of dot and cross product of two vectors is equal at an angle of	30^0	45^0	90^0	270^0
8.	The minimum and maximum magnitudes of the resultant of the two vectors are 7 and 1. Now if these vectors are perpendicular , then magnitude of their resultant is	6	5	8	7
9.	If the angle between two unit vectors is 90^0, then their resultant will have magnitude	1	0	$\sqrt{2}$	$2\sqrt{2}$
10.	If $\vec{A}=\hat{i}-\hat{j}$ and $\vec{B}=3\hat{i}+3\hat{j}$, then vectors are	Parallel	Anti – parallel	Perpendicular	Making an angle of 60^0 with each other
11.	If two vectors are parallel, then their resultant vector's magnitude is	Maximum	Minimum	Zero	Constant

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. If a vector $\vec{A}$ lies in the XY - plane, under what conditions its components have opposite signs? Under what conditions its components have negative signs?

ii. Define the terms. **(i)** Unit vector **(ii)** Position vector **(iii)** Components of a vector.

iii. Can a vector have a component greater than the vector's magnitude?

iv. How would the two vectors of the same magnitude have to be oriented, if they were to be combined to give a resultant equal to a vector of the same magnitude?

v. Identify true or false statements and explain the reason. **(i)** A body in equilibrium implies that it is neither moving nor rotating. **(ii)** If coplanar forces acting on a body form a closed polygon, then the body is said to be in equilibrium.

vi. If $\vec{A}+\vec{B}=0$. What can you say about the components of these vectors?

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

SECTION – II (ESSAY TYPE) Attempt given question

3. Do as directed...

i. What is torque? Explain in detail moment of force due to a rigid body. (5)

ii. Vectors $\vec{A}$, $\vec{B}$ and $\vec{C}$ are 4 units north, 3 units west and 8 units east respectively. Describe carefully $\vec{A}\times\vec{C}$. (3)

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SECTION – III (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 negative in a vernier calipers.

iii. What is vernier constant?

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 ($1/N$). (4)

i. What you conclude from the graph?

ii. Find the value of $1/4.3$ from the graph.

Good Luck

Ch. Khalid Mahmood Ashraf