

Name: _____					
Subject: Physics		Class: 9 th	Time: 80 minutes	Total Marks:	40
Chapter No.4		MJDexpert.com			Obtained marks

Note: Please attempt any 10 short questions from Question 2. Also, attempt both parts (a and b) of Question 3. Cutting and removal of any content is strictly prohibited.

Q.1: Tick (✓) the correct answer.

- The head-to-tail rule can be used to add:
 - 2 vectors
 - 3 vectors
 - Any number of vectors
 - 4 vectors
- A vector can be split into:
 - 1 component
 - 3 components
 - 5 components
 - 2 components
- The value of \tan for an angle of 45° is:
 - 0.5
 - 1.732
 - 0.577
 - 1
- The rotational effect of a force is known as:
 - Momentum
 - Torque
 - Pressure
 - Work
- The symbol for the moment arm is:
 - T
 - L
 - F
 - M
- The point where a force causes an object to move is called the:
 - Center of gravity
 - Center of mass
 - Center of the body
 - Center of axis
- A steering wheel demonstrates the concept of:
 - Force
 - Couple
 - Net Force
 - Momentum
- The first condition of equilibrium is mathematically expressed as:
 - $\Sigma F = 0$
 - $\Sigma \tau = 0$
 - $F = ma$
 - $W = mg$
- A neutral equilibrium example is:
 - Football
 - Block
 - Pencil balanced on its tip
 - Book on a table
- The center of gravity of a sphere is located:
 - At the sphere's center
 - Outside the sphere
 - Along the radius of the sphere
 - None of these

Q.2: Write short answers to any ten (10) of the following questions.

- Explain the difference between like and unlike parallel forces.
- Define resultant forces and illustrate with a diagram.
- How does the head-to-tail method help in finding the resultant of vectors?
- Explain the resolution of forces and its perpendicular components.
- What is the difference between the axis of rotation and the moment arm?
- If the moment arm is doubled, how does it affect the torque?
- State the principle of moments.
- Describe how to determine the center of gravity of an irregularly shaped thin lamina.
- When is an object said to be in equilibrium?
- Compare stable and neutral equilibrium.
- Provide the mathematical expressions for the conditions of equilibrium.
- Why are vehicles designed with a low center of gravity?

Q.3: Answer the following questions.

- Describe stable and unstable equilibrium with suitable examples.
- Write a short note on the center of gravity.