

# Al-Saudia Virtual Academy

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Torque Angular

Momentum and

Equilibrium

## Chapter no.5

### MCQs

- Turning effect of a force about an axis of rotation is called:
  - Moment arm
  - Momentum
  - Couple
  - Torque
- Cross or vector product of position vector  $\vec{r}$  and force  $\vec{F}$  is called:
  - Work
  - Angular momentum
  - Couple
  - Torque
- S. I unit of torque is:
  - N m
  - N/m
  - N s
  - N/s
- If  $\theta$  is the angle between the applied force  $\vec{F}$  and position vector  $\vec{r}$ , then the magnitude of torque action on body is given by:
  - $T = r F \sin \theta$
  - $T = r F \cos \theta$
  - $T = r F \tan \theta$
  - $T = r F (\sin \theta)^{-1}$
- Direction of torque is determined by:
  - Law of Sines
  - Head to tail rule
  - Right hand rule
  - Left hand rule
- Conventionally torques producing anticlockwise rotation in a body is taken as:
  - Positive
  - Negative
  - Neutral
  - Zero
- Two equal and opposite forces acting along different lines produce or tend to produce rotation in a body in the same direction, they are said to form:
  - A pair of anti parallel forces
  - A couple
  - Balanced forces
  - Equilibrium forces
- Dimensions of torque are:
  - $ML^2T^{-2}$
  - $ML, T^2$
  - $ML^{-2}T^2$
  - $ML^{-1}T^2$
- A point at which whole weight of the body acts is called:
  - Center of gravity
  - Center of mass
  - Center of the body
  - Axis of rotation
- A point at which whole mass of the body appears to be concentrated is called:
  - Center of gravity
  - Center of mass
  - Center of the body
  - Axis of rotation
- A body at rest or moving with uniform velocity is said to be in:
  - Static equilibrium
  - Dynamic equilibrium
  - Equilibrium
  - None of these.
- A body moving with uniform velocity is said to be in:
  - Neutral equilibrium
  - Complete equilibrium
  - Rotational equilibrium
  - Dynamic equilibrium.
- A body rotating with uniform angular velocity is said to be in:
  - Translational equilibrium
  - Complete equilibrium
  - Rotational equilibrium
  - Neutral equilibrium.

14. According to first condition of equilibrium:

- (a)  $\sum F_x = 0$
- (b)  $\sum F_y = 0$
- (c)  $\sum F_x = 0$  and  $\sum F_y = 0$
- (d)  $\sum F_z = 0$

15. A body satisfying first condition of equilibrium will have:

- (a) Constant linear acceleration
- (b) Positive linear acceleration
- (c) Negative linear acceleration
- (d) Zero linear acceleration.

16. A body satisfying first condition of equilibrium will be in:

- (a) Translational equilibrium.
- (b) Complete equilibrium.
- (c) Rotational equilibrium.
- (d) Neutral equilibrium.

17. According to second condition of equilibrium:

- a)  $\sum F_x = 0$
- b)  $\sum F_y = 0$
- c)  $\sum F_x = 0$  and  $\sum F_y = 0$
- d)  $\sum T = 0$

18. A body satisfying second condition of equilibrium will have.

- a) Positive angular acceleration.
- b) Negative angular acceleration.
- c) Constant angular acceleration.
- d) Zero angular acceleration.

19. A body satisfying second condition of equilibrium will be in:

- a) Translational equilibrium.
- b) Complete equilibrium.
- c) Rotational equilibrium.
- d) Neutral equilibrium.

20. If line of action of a force passes through the axis of rotation then the torque acting on the body will be:

- a) Very small.
- b) Maximum.
- c) Zero.
- d) Negative.

21. Conventionally torques producing clock wise rotation in a body is taken as:

- a) Positive.
- b) Negative.
- c) Zero.
- d) Neutral.

22. Cross or vector product of position vector  $\vec{r}$ , and linear

Momentum  $\vec{p}$  is called:

- a) Torque
- b) Moment of inertia.
- c) Moment of force.
- d) Angular of momentum.

23. Dimensions of angular momentum are:

- a)  $ML^2 T^{-1}$
- b)  $MLT^2$
- c)  $M^2LT^{-1}$
- d)  $MLT^2$

24. S.I unit of angular momentum is:

- a) N-m
- b) J-s
- c) J/s
- d)  $J/s^2$

25. Rate of change of angular momentum is equal to

- a) Torque.
- b) Linear momentum
- c) Couple.
- d) Applied force.

26. A body satisfying both conditions of equilibrium will be in:

- a) Translational equilibrium.
- b) Complete equilibrium.
- c) Rotational equilibrium.
- d) Neutral equilibrium.

27. The perpendicular distance between line of action of force and axis of rotation is called:

- a) Position vector.
- b) Moment arm.
- c) Moment of force.
- d) Couple distance.

28. centre of mass of a uniform solid sphere lies at:

- a) On the surface of the sphere.
- b) It's centre.
- c) Anywhere on the axis of sphere.
- d) None of these.

29. Angular momentum of a body of mass  $m$  moving along a circular path of radius  $r$  with linear velocity  $v$  is given by:

- a)  $L = m v r$
- b)  $L = m v^2 r$
- c)  $L = m v/r$
- d)  $L = mv^2/r$

30. Two forces are equal in magnitude but opposite in direction and not acting on the same line constitute a:

(4-an ii, Pre.Eng. 03)

- a) Couple.
- b) Circle
- c) Power
- d) Force

31. A body may be in equilibrium when: (3-a I, Pre.Eng. 2002)

- a) It is at rest.
- b) It is in motion.
- c) It is moving with a uniform acceleration.
- d) It is moving with a variable velocity.

32. The rate of change of angular momentum is equal to the: (3-a ii, Pre.Eng. 2002)

- a) Force exerted on the body.
- b) Force exerted by the body.
- c) Torque.
- d) Angular acceleration.

33. The units of angular momentum are: (3-a ii, Pre.Eng. 2003)

- a) Newton-sec.
- b) Joule-sec.
- c) Newton-meter.
- d) Joule-meter.

34. The physical quantity which produces angular acceleration is called: (2-a iii pre.Eng.2003)

- a) Torque.
- b) Work.
- c) Power.
- d) Energy.

35. When the net force acting on a system is zero, which of the following will be constant: (3-a ii 2004)

- a) Force.
- b) Angular momentum.
- c) Linear momentum

36. A body in equilibrium: (4-a I 2005)

- a) Is always at rest.
- b) Can move with constant speed.
- c) Can move with constant acceleration.
- d) Can move with variable acceleration.

37. The rate of change of angular momentum is called: (4-a ii 2005, 09)

- a) Force.
- b) Acceleration.
- c) Inertia.
- d) Torque.

38. The angular momentum of a particle is conserved if the: (5-xiii, 2009)

- a) Net torque acting on the particle is zero.
- b) Net force acting on the particle is zero.
- c) The acceleration of the particle is zero.
- d) Net displacement of the particle is zero.

39. Torque is defined as the time rate of change of: (1-iv, 2010)

- a) Angular momentum.
- b) Linear momentum.
- c) Angular velocity.
- d) Angular acceleration.

40. Two forces equal in magnitude but opposite in direction and not acting on the same line constitute:

(1- ix, 2011)

- a) A couple.
- b) Power.
- c) A circle.
- d) A force.

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