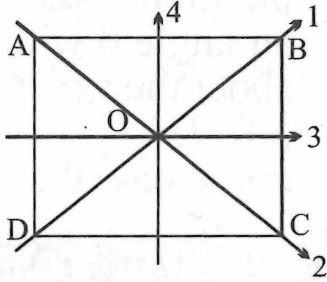


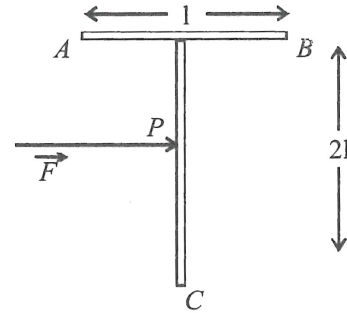
PHYSICS

11. The moment of inertia of a thin square plate ABCD, Fig., of uniform thickness about an axis passing through the centre O and perpendicular to the plane of the plate is where I_1 , I_2 , I_3 and I_4 are respectively the moments of inertial about axis 1, 2, 3 and 4 which are in the plane of the plate.



- (1) $I_1 + I_2$ (2) $I_3 + I_4$
 (3) $I_1 + I_3$ (4) all of the above
12. Radius of gyration of a body depends upon
 (1) shape of the body
 (2) axis of rotation
 (3) both (1) and (2)
 (4) None of these
13. When the axis of rotation passes through its centre of mass, then the moment of inertia of a rigid body is
 (1) reduced to its minimum value
 (2) zero
 (3) increased to its maximum value
 (4) infinity.
14. If there is a change of angular momentum from J to 4 J in 4 sec, then the torque, is
 (1) 0.5 J (2) $\left(\frac{3}{4}\right)J$
 (3) $\left(\frac{5}{4}\right)J$ (4) $\left(\frac{4}{3}\right)J$
15. The angular momentum of a moving body remains constant if
 (1) net external force is applied
 (2) net external torque is applied
 (3) net pressure is applied
 (4) net external torque is not applied.
16. A '7' shaped object with dimensions shown in the figure, is lying on a smooth floor. A force 'P' is applied at the point P parallel to AB, such that the object has only the translational

motion without rotation. Find the location of P with respect to C.



- (1) $\frac{3}{2}l$ (2) $\frac{2}{3}l$
 (3) l (4) $\frac{4}{3}l$
17. One solid sphere A and another hollow sphere B are of same mass and same outer radii. Their moment of inertia about their diameters are respectively I_A and I_B such that
 (1) $I_A < I_B$ (2) $I_A > I_B$
 (3) $I_A = I_B$ (4) $\frac{I_A}{I_B} = \frac{d_A}{d_B}$
18. Match the List – I with List – II

List – I		List – II	
A.	Moment of inertia of solid sphere of radius R about any tangent	I.	$\frac{5}{3}MR^2$
B.	Moment of inertia of hollow sphere of radius R about any tangent	II.	$\frac{7}{5}MR^2$
C.	Moment of inertia of circular ring of radius R about its diameter	III.	$\frac{1}{4}MR^2$
D.	Moment of inertia of circular disc of radius R about any diameter	IV.	$\frac{1}{2}MR^2$

Choose the correct answer from the options given below

- (1) A-II, B-I, C-IV, D-III
 (2) A-I, B-II, C-IV, D-III
 (3) A-II, B-I, C-III, D-IV
 (4) A-I, B-II, C-III, D-IV
19. Two objects of mass 10 kg and 20 kg respectively are connected to the two ends of a rigid rod of length 10 m with negligible mass.

The distance of the center of mass of the system from the 10 kg mass is

- (1) $\frac{20}{3}$ m (2) 10 m
(3) 5 m (4) $\frac{10}{3}$ m

20. Which of the following statements are correct?

- (1) Centre of mass of a body always coincides with the centre of gravity of the body
(2) Centre of mass of a body is the point at which the total gravitational torque on the body is zero
(3) A couple on a body produce both translational and rotation motion in a body
(4) Mechanical advantage greater than one means that small effort can be used to lift a large load

- (1) (1) and (2) (2) (2) and (3)
(3) (3) and (4) (4) (2) and (4)



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