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Competitive Exams: Physics MCQs (Practice_Test 17 of 35)

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1. Match List I with List II and select the correct answer using the codes given below the lists:

List-I (Physical Quantity)	List-II (Dimension)
A. Angular momentum	1. $ML^{-1} T^{-1}$
B. Torque	2. MT^{-2}
C. Surface tension	3. $ML^2 T^{-1}$
D. Coefficient of viscosity	4. $ML^{-1} T^{-2}$

A B C D

a. 4 3 2 1

b. 3 4 2 1

c. 1 4 2 3

d. 3 1 4 2

2. The dimension of centripetal force is

a. L^2/T^2

b. L^2/T

c. L/T^2

d. $1/T^2$

3. A wheel of radius 1 metre rolls forward half a revolution on a horizontal ground. The magnitude of the displacement of the point of the wheel initially in contact with the ground is
- $2p$
 - $\sqrt{2}p$
 - $p\sqrt{2} + 4$
 - p
4. Two forces each of magnitude $2N$, act at an angle of 60° . The magnitude of the resultant force is
- $\sqrt{1.1}$ Newton
 - $\sqrt{4}$ Newton
 - $\sqrt{12}$ Newton
 - $\sqrt{14.9}$ Newton
5. A particle moves in the direction of east for 2 s with a velocity of 15 m/s. Then it moves towards north for 8 s with a velocity of 5 m/s. The average velocity of the particle is
- 1 m/s
 - 5 m/s
 - 7 m/s
 - 10 m/s
6. For an electron moving in an elliptical orbit with the nucleus at the focus of the ellipse, the torque on the electron with respect to the nucleus
- is zero at all times
 - is constant but not zero
 - varies with position
 - cannot be defined
7. A body of mass 2 kg is moving under the influence of a central force whose potential energy is given by $U(r) = 2r^3$ Joule. If the body is moving in a circular orbit of 5 m, its energy will be
- 125 J
 - 250 J
 - 500 J

d. 625 J

8. An object moves along a straight line path from P to Q under the action of a force $(4i - 3j + 3k)$, N. If the coordinates of P and Q, in metres, are (3,3, 1) and (2,1; 4) respectively, then the work done by the force, is

a. + 15J

b. -15J

c. 1015 J

d. $\sqrt{35} (4i - 3j + 2k)$ J

9. Which of the following are correct with reference to energy?

a. It has dimensions of ML^2T^{-2}

b. It is a scalar.

c. Its S. I. Unit is watt.

d. It can neither be created nor destroyed.

Select the correct answer using the codes given below:

a. 1,2, 3 and 4

b. 1,2 and 3

c. 1,2 and 4

d. 1,3 and 4

10. Work done in carrying a particle from A to B is independent of the path chosen implies that

a. the linear momentum is conserved

b. the angular momentum is conserved

c. the component of angular momentum along the line joining A and B is conserved

d. the potential function can be defined

11. If the earth is a point mass of 6×10^{24} kg revolving around the sun at a distance of 1.5×10^8 km and in time $t = 3.14 \times 10^7$ s, then the angular momentum of the earth around the sun is

a. 1.2×10^{18} kg m²/s

b. 1.8×10^{29} kg m²/s

c. 1.5×10^{37} kg m²/s

d. 2.7×10^{40} kg m²/s

12. A particle is moving on a circular orbit of radius r_1 with an angular velocity ω_1 . It jumps to another circular orbit of radius R_2 and attains an angular velocity ω_2 . If $r_2 = 0.5 r_1$ and assuming that no external torque is applied to the system, then, the angular velocity, ω_2 is given by
- $\omega_2 = 4\omega_1$
 - $\omega_2 = 3\omega_1$
 - $\omega_2 = 2\omega_1$
 - $\omega_2 = \omega_1$
13. If a body of mass 45kg resting on a rough horizontal surface can be just moved by a force of 10 kg weight acting horizontally, then the coefficient of sliding friction is
- 4.5
 - 0.5
 - 0.45
 - 0.22
14. When a satellite moves round the earth, the quantity which remains constant is
- angular velocity
 - kinetic energy
 - potential energy.
 - aerial velocity
15. If a planet revolves round the sun in a circular orbit of radius 'a' with a period of revolution T, then (k being a positive constant)
- $T = k a^{\frac{2}{3}}$
 - $T = k a^{\frac{3}{2}}$
 - $T = k a^2$
 - $T = k a^3$