Physics-Set-1

1. The dimensional formula of angular momentum is

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

2. Two solid spheres A and B each of radius 'R' are made of materials of densities ρ_A and ρ_B respectively. Their moments of inertia about a diameter are I_A and I_B respectively. The value of $\frac{I_A}{I_B}$ is

   a) $\sqrt{\frac{\rho_A}{\rho_B}}$ b) $\sqrt{\frac{\rho_B}{\rho_A}}$ c) $\frac{\rho_A}{\rho_B}$ d) $\frac{\rho_B}{\rho_A}$

3. When a vibrating tuning fork is placed on a sound box of a sonometer, 8 beats per second are heard when the length of the sonometer wire is kept at 101 cm or 100 cm. Then the frequency of the tuning fork is (consider that the tension in the wire is kept constant)

   a) 1616 Hz   b) 1608 Hz   c) 1632 Hz   d) 1600 Hz

4. Sum of magnitudes of two forces acting at a point is 16N. if their resultant is normal to smaller force, and has a magnitude 8 N, then forces are

   a) 6N, 10N   b) 8N, 8N   c) 4N, 12N   d) 2N, 14N

5. Two spheres of the same material have radii 1 m and 4 m and temperatures 4000K and 2000K respectively. The ratio of the energy radiated per second by the first sphere to that by the second is

   a) 1:1   b) 16:1   c) 4:1   d) 1:9

6. In an isothermal process
   a) Pressure remains constants
   b) Temperature remains constant
   c) Volume remains constant
   d) Kinetic energy remains constant

7. A long spring is stretched by 2 cm and its potential energy is V. If the spring is stretched by 10 cm, its potential energy will be

   a) V/25   b) V/5   c) 5V   d) 25V

8. First law of thermodynamics is a consequence of the conservation of

   a) Charge   b) heat   c) energy   d) momentum

9. A weightless rubber balloon has 100 gm of water in it. Its weight in water will be

   a) 100 gm   b) 20 gm   c) 200 gm   d) zero

10. Two capillary tubes of different diameters are dipped in water. The rise of water is

a) greater in the tube of smaller diameter

b) greater in the tube of larger diameter

c) same in both tubes

d) zero in both tubes

11. Capacitance of a spherical conductor having radius 1 m, is

a) 1.1×10^{-10} F   b) 10^{-6}F   c) 9×10^{-9} F   d) 10^{-3} F

12. The resistance of a wire is 5Ω at 50°C and 6Ω at 100°C. The resistance of the wire at 0°C will be

a) 2 Ω   b) 1 Ω   c) 4 Ω   d) 3 Ω

13. An electric bulb is rated 220V-100W. The power consumed by it when operated on 110V will be

a) 75W   b) 40W   c) 25W   d) 50W

14. The flux linked with a coil at any instant t is given by $\phi = 10t^2 - 50t + 250$. The induced emf at t=3 s is

a) -190 V   b) -10 V   c) 10 V   d) 190 V

15. The maximum velocity of a particle, executing simple harmonic motion with an amplitude 7 mm, is 4.4 ms^{-1}.The period of oscillation is

a) 0.01 s   b) 10 s   c) 0.1 s   d) 100 s

16. The displacement y of a wave travelling in the x-direction is given by $y = 10^{-4} \sin \left(600t - 2x + \frac{\pi}{3} \right)$ meter, where, x is expressed in meters and t in seconds. The speed of the wave motion , in ms^{-1} is

a) 300   b) 600   c) 1200   d) 200

17. Two lenses of power -15D and +5D are in contact with each other. The focal length of the combination is

a) -20 cm   b) -10 cm   c) +20 cm   d) +10 cm

18. If two mirrors are kept at 60° to each other, then the number of images formed by them is

a) 5   b) 6   c) 7   d) 8

19. The energy band gap is maximum in

a) metals   b) superconductors   c) insulators   d) semiconductors

20. The half-life of a radioactive element is 10 hours. The fraction of initial radioactivity of the element that will remain after 40 hours is

a) ½   b) ¼   c) 1/16   d) 1/8

Answers:

Q. No.	1	2	3	4	5	6	7	8	9	10
Key	D	C	B	A	A	B	D	C	D	A
Q. No.	11	12	13	14	15	16	17	18	19	20
Key	A	C	C	B	A	A	B	A	C	C