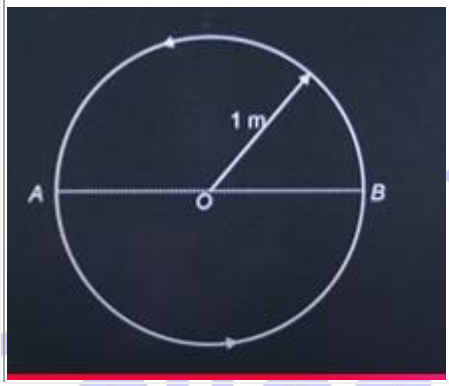
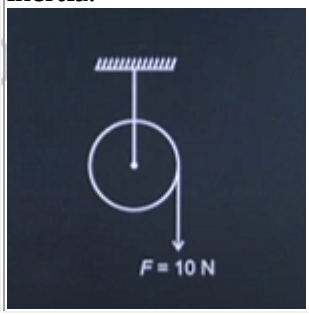
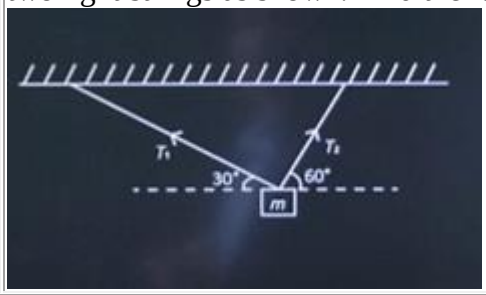
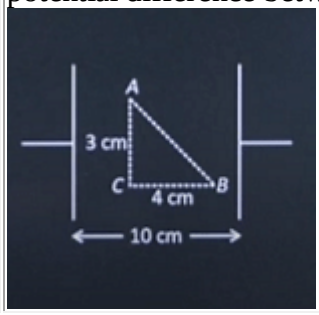
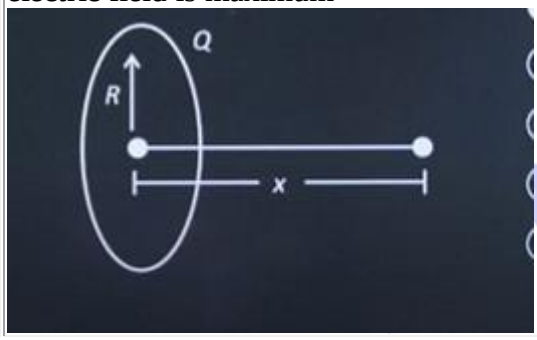
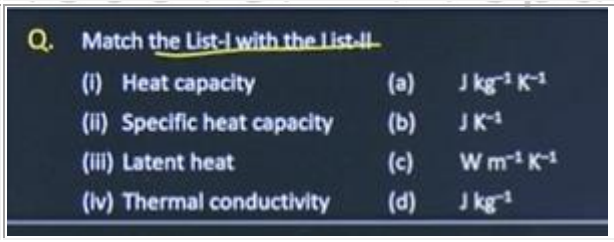
2 April 2025 Shift 2 JEE Main Physics

Question Paper with Answer Key

Q.No.	Question	Answers
1	What is the dimensional formula of $1/\omega_0 e_0$ (where $\mu 0$ is permeability and & is permittivity of free space)	L^2T^{-1}
2	An equilateral prism is made of a material of refractive index $\sqrt{2}$. Find angle of incidence for minimum deviation of the light ray.	45 degree
3	The moment of inertia of a ring of mass M and radius R about an axis passing through tangential point in the plane of ring is	$3/2\ MR^2$
4	A particle moves on a circular path of radius 1 m. Find its displacement when it noves from A→B→A→B. Also its distance are it moves from A→B→A →B→A. 	Distance = 4πm, Displacement = 2m
5	4 disc of mass M and radius 2 mis hinged keeping axis horizontal. If rad/s² angular acceleration of disc is is 2 rad/s². Find moment of inertia. 	$10\ kgm^2$
6	Binding energy per nucleon in H is x and for He is y. Find energy released in the given reaction H+ He→→ He	-4x + 4y
7	A block of mass m is suspended in a vertical plane with the help of two light strings as shown. Find the ratio of tensions T_1/T_2 	$1/\sqrt{3}$

8	The figure shows the plates of a parallel plate capacitor with a separation 10 cm and charged to a potential difference V. Find the potential difference between B and A. 	2V/5
9	Figure shows a uniformly charged ring having charge Q and radius R. Find the distance from the centre on the axis of the ring where electric field is maximum 	R/√2
10	Two identical drops of radius Band surface tension 'T/Coalesce to form a bigger drop. The change in surface energy in this process is	$8\pi R^2 [2^{-1/3} - 1]$
11	Two galvanometers G_1 and G_2 are having resistors R_1 = 50 and R_2 = 72, number of turns N_1= 21, N_2 = 15, magnetic fields B_1 = 0.25 T, B_2 = 0.50 T and area of coil A = 3.6 x 10-3 cm² and A_2 = 1.8 x 103 cm². Find the ratio of their voltage sensitivity (same spring in both)	49/25
12		(i) b (ii) a (iii) d (iv) c
13	In a system of measurement, electric charge (Q), permeability (μ_0) and electric current (I) are considered as fundamental quantity. The dimension of linear momentum in this system is	[Qμ_0f]
14	Which of the following items (labelled i, ii, ii, iv and v) are true? When an ideal gas undergoes adiabatic process, (symbols have their usual meaning) (i) $\Delta U = Q$ (ii) $W = -\Delta U$ (iii) PV= Constant (iv) VT = Constant	(ii) and (v)
15	A wave is travelling along a string. The wavelength (λ.) of the wave is 7.5 m and amplitude is 2 cm. At t = 0, there is a crest at x	2cos (4π/15 x - 8π/75 t) cm

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	= 0 and in 0.3 seconds it travels a distance of 12 cm in +ve x-direction. The equation of the wave is	
16	An equiconvex lens of radius R = m is having power P. Another Bi 6 convex lens of radii R_1 and R_2 is having same power P, then	$R_1=1/9m_1$ $R_2=1/3$ m
17	The area of a solenoid is A, length is L, magnetic field inside is Bo and the relative permeability of medium is 2. The energy stored due to the magnetic field is	BO^2 Al/ 4μ0
18	The radius of first Bohr orbit of Li2+ is, where a is the radius of the first Bohr orbit of H. Find X	3
19	The length of the string in 104 m when the tension in it is 5 N. The length becomes 1.56 m when the tension in it is 7 N. The natural length of the string is _____ m.	1 m
20	A concave mirror and a convex mirror of same focal length are given. A real object is placed in front of the mirror at a distance equal to half the focal length. The ratio of lateral magnification in the image produced by concave mirror to that produced by the convex mirror is	3

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