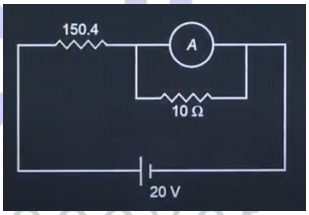
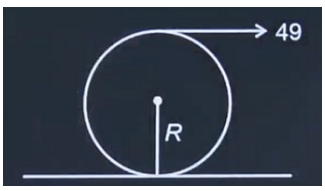
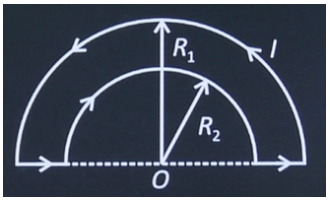
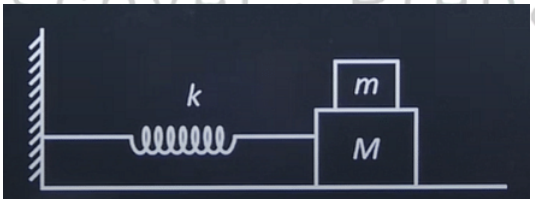
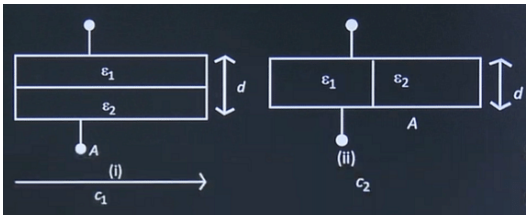
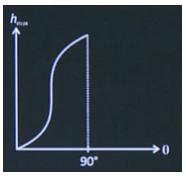
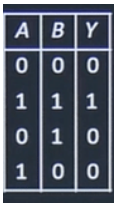
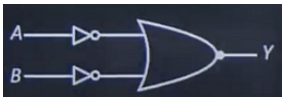
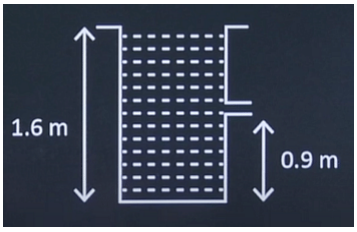
JEE Main 3 April 2025 Shift 1

Physics Question Paper with Answer Key

Q.No.	Question	Answers
1	An ideal gas with an adiabatic exponent 1.5, initially at 27°C is compressed adiabatically from 800 cc to 200 cc. The final temperature of the gas is	600 K
2	In YDSE, light of intensity of 4*I* and 9*I* passes through two slits respectively. Difference of maximum and minimum intensity of interference pattern is	24*I*
3	An ammeter having resistance 240 Ω is connected in the given circuit as shown. Find current through the ammeter. 	5 mA
4	A thin uniform wire of length 25 m and area of cross-section 5 mm^2 has resistivity 2×10^{-6} Ω-m. If the wire is bent to form a circle, the resistance across diametrically opposite points is	2.5 Ω
5	A sphere of mass 20 kg is pulled with force of 49 N as shown in diagram. Acceleration of sphere assuming no slipping. 	3.5 m/s^2

6	A current carrying wire is bent as shown in the figure. Find magnetic field at centre O of the semi-circles. (Take $R_1 = 4\pi$ and $R_2 = 6\pi$) 	$8.3I * 10^{-9}$ T
7	A biconvex lens is having the radius of curvature of 10 cm and 15 cm. If focal length of the lens is 12 cm find refractive index of material of the lens.	3/2
8	The figure below shows an oscillating system of two blocks and a spring. The horizontal surface is smooth, and the contact between the blocks is rough with coefficient of static friction μ. Considering that the blocks of mass m is always stationary relative to M, choose the correct option regarding the statement below: (A) Maximum frictional force between blocks is μ mg. (B) Time period of oscillation is $2\pi\sqrt{m+M/k}$ (C) Friction between the blocks at any instant is μ(m + M)g 	Only B option is correct.
9	A point source of power 450 W is emitting light in all direction. Radiation pressure at distance of 2m from the source is nearly	$3 * 10^{-8}$ Pa
10	Choose the correct option. a. Gravitational potential (i) $M^{-1}L^3T^{-2}$ b. Gravitational constant (ii) ML^2T^{-2}	a(iii), b(i), c(iv), d(ii)

	C. Acceleration due to gravity (iii) $M^0L^2T^{-2}$ d. Potential energy (iv) M^0LT^{-2}	
11	Capacitors with dielectric are shown in figure (symmetric situation). Find C_1/C_2 	$4\varepsilon_1\varepsilon_2/(\varepsilon_1+\varepsilon_2)^2$
12	From a horizontal surface a particle is projected with a speed u. Which of the following correctly represents the variation of maximum height above the surface attained by the particle as the angle of projection is varied?	
13	The electric potential at the surface of a shell of radius 10 cm is 120 V. Find the potential at its centre, at r = 5 cm from centre and at r = 15 cm from centre.	120 V, 120 V, 80 V
14	Find the colour corresponding to photons of energy 3 eV.	Blue
15	An object is dropped from height S. At a point its kinetic energy is three times its potential energy. Find its height from ground and speed at that point.	S/4, $\sqrt{3}gS/2$
16	Truth table of logical circuit is given. Then identify the correct circuit. 	

17	Find force (in millinewton) on current carrying wire of length / = 4 m, and current of 8 A placed perpendicular to the magnetic field of ß = 0.15 T.	4800 mN
18	A container of height 1.6 m is having a small hole at height of 0.9 m from ground then find the speed of efflux from the hole [use g = 9.8 m/s^2] 	3.71 m/s