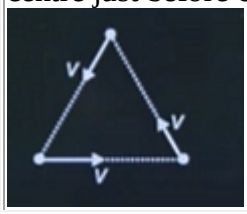
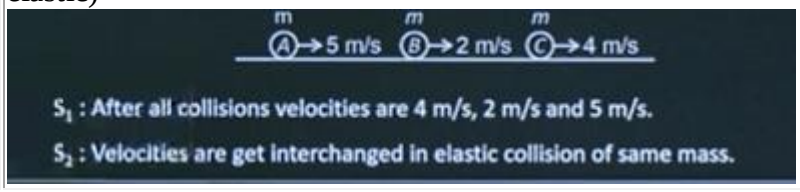
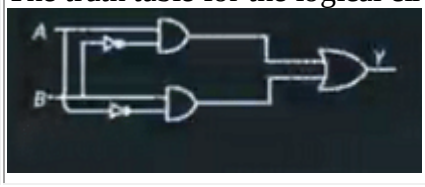
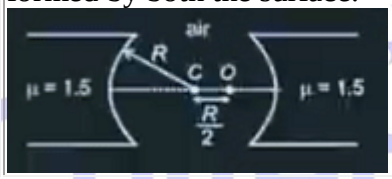
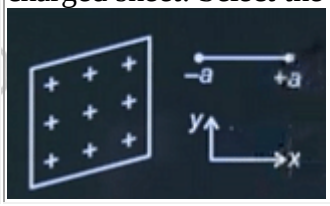
JEE MAIN 29 JANUARY 2025 SHIFT 2

PHYSICS QUESTION PAPER WITH ANSWER KEY

Q.No.	Questions	Answers
1	An equiconvex lens is cut into two ways as shown. If the focal length of the parts are as mentioned in the diagram. Find L_1/L_2	1/2
2	A solenoid of radius 10 cm carrying current 0.29 A and having total 200 turns. If magnetic field inside solenoid is 2.9 x 10^{-9} Find length of solenoid	8πcm
3	Three identical particles, each of mass m move under the influence of mutual attraction forces. Initially they are on the vertices of an equipotential triangle of side 'a' and have equal speed v direct towards the adjacent particles as shown. The net angular momentum about the centre just before collision is 	√3/2 mva
4	Match the physical quantities with their corresponding dimensions Column-I: (A) Young's modulus; (B) Magnetic moment; (C) Magnetic flux; (D) Magnetic Intensity Column-II: (i) $[AL^{-2}]$; (ii) $[ML^2T^{-2}A^{-1}]$; (iii) $[AL^{-1}]$; (iv) $[ML^{-1}T^{-2}]$	A (iv) B (i) C (iii) D (ii)
5	Two particles of same mass are performing SHM vertically with two different springs of spring constants K_1 and K_2. If amplitude of both is same. Find ratio of the maximum speed of two particles.	$\sqrt{K_1/K_2}$
6	A physical quality Q is given as $Q = ab^4/cd$, if the percentage error is a,b,c and d are 2%, 1%, 2% and 1% the % error in Q will be	9%
7	Assertion: On increasing the pressure, the volume decrease is more in an isothermal process than in an adiabatic process. Reason: Adiabatic process is given by PV^{-1}	Assertion is correct and Reason is correct
8	Two planet A and B are revolving around a massive start such that $r_A = 2r_B$ and $m_A = 4\sqrt{3}\ m_B$ Find ratio of angular momentum of planet B to planet A.	1/ 2√3
9	A capacitor C_1= 6μF, initially charged with a call of emf 5V is disconnected and connected to another capacitor C_2= 6μF, which is initially neutral. The charges on C_1 and C_2 after connection are	10μc, 20μc

10	Three particles of same mass are moving as shown. (all collisions are elastic) 	S1 Incorrect, S2: Correct
11	An electromagnetic wave propagates in +X direction, then electric field and magnetic field are direct along	Y, Z
12	A converting lens of focal length 24cm, made of glass (μ_{glass}) is immersed completely in water. (μ_{glass} = 1.33). It will now behave like a converging lens of focal length ____ cm.	96
13	The truth table for the logical circuit shown below is 	
14	Figure shows two spherical surfaces of radius R having common centre. If the object is placed at O_3 Find the distance between the first images formed by both the surface. 	4R/35
15	A dipole is placed such that its axis is perpendicular to the infinite charged sheet. Select the correct options 	b and c
16	A cup of coffee take a time 't' to cool from 90 degree Celcius to 80 degree Celcius in a surrounding of 20 degree Celcius.If a similar cup of coffee is cooled from 80 degree Celcius to 60 degree in a same surrounding, it takes a time	13/5 t
17	Find the number of spectral lines in H-atom when deexcitation from n=4 to ground state	6
18	For a certain mechanical system the rate of accretion dm/dt is proportional to $\sqrt{v}$, where m is mass, t is time v is velocity, then the power is proportional to $v^{n/2}$ where n is _____.	5