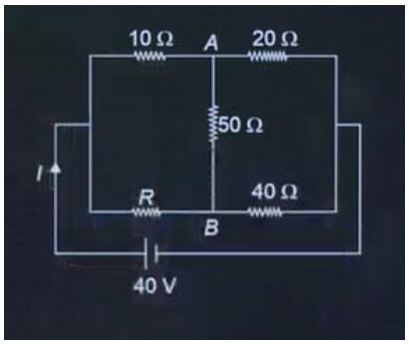
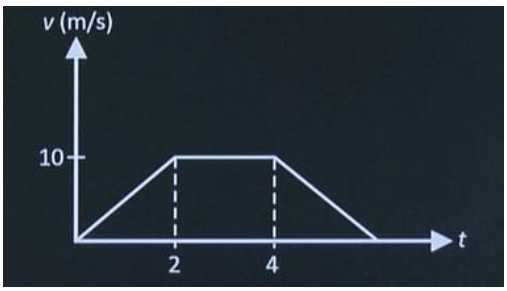
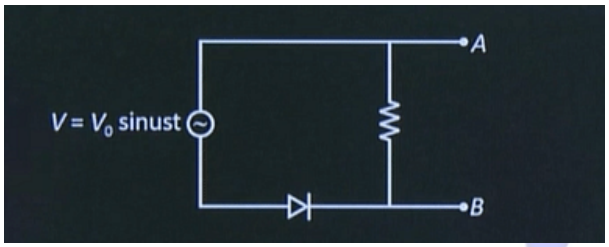
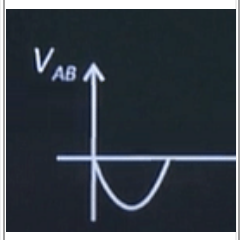
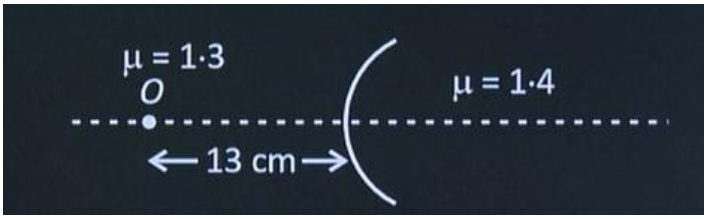
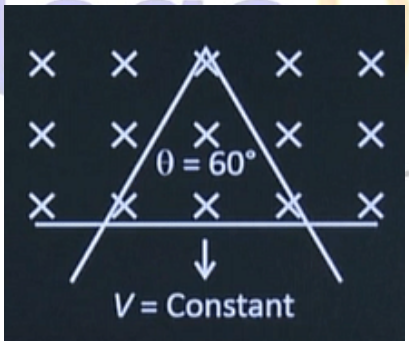
JEE MAIN 28 JANUARY 2025 SHIFT 2

PHYSICS QUESTION PAPER WITH ANSWER KEY

Q.No.	Questions	Answers
1	In the given circuit, find l if the potentials at A and B are equals 	2 A
2	No of Paramagnetic species among the following is: O2,O2+O2-NO2,NO,CO	5
3	How many of the following molecules are polar? CH4,CCI4,CH2CL2,H2O,NH3,H2O2,O2F2	5
4	In an electromagnetic wave, the magnetic field is given as B = (√3/2)i + (1/2)j) 30sin(ωt - kz), the corresponding electric field is	(1/2i-√3/2j) 9 x 109sin (ωt - kz)
5	The magnetic field B at the centre O of the given arrangement is	+μol/8πa(3π+2)k
6	A balloon system having mass m is moving up with acceleration a, find the mass to be removed from it to have acceleration 3a. (Neglect the volume of mass attached)	ma/3a+g
7	Mass M and radius R of a planet is related with Mass Me and Radius Re of earth as Me= 8Mp and Re= 2Rp. If escape speed for each is 11.2 km/sec, then escape speed of the planet is	5.6 km/sec
8	An equilateral triangle frame of side l is carrying current i, find magnetic field at its centroid	9μoi/2πl
9	The velocity vs time graph of a particle moving along X-axis is plotted as shown. The distance travelled (in metre) by the particle	30 m

	in the interval t= 0 s to t=4 s is 	
10	Choose the correct option representing the energy density between the plates of a parallel plate capacitor with plate area A, plate separation d and potential difference V.	∈oV2/zd2
11	The correct variation of voltage across AB is given by (consider that the threshold voltage of the diode is very small) 	
12	An electric dipole of moment 6 x 10-6 cm is placed parallelly in electric field of strength 106 N/C. Work done required to rotate the dipole by 180° is X joules, then X is	12
13	Distance between real object and its three times magnified image formed by concave mirror is 20 cm the radius of curvature of the mirror is X cm, then X is	15
14	Select the correct match for dimensions Column-I Column-II A) Angular Momentum I) [MLT-2] B) Force II)[ML2T-1] C) Engery III)[ML-1T-2] D) Pressure IV)[ML2T-2]	A-II, B-I, C-IV, D-III
15	In the figure shown the object kept at a distance 13 cm from the interface forms a real image which is double in size. The radius of	2/3 cm

	curvature of the interface is 	
16	Due to the bar magnet shown, if the % uncertainty in d is 1%, find uncertainty in the magnetic field at P. [d:10 units, l=10 units]	1.5%
17	A capacitor of capacitance 1 μF is charged to potential of 20 V. Distance between plates is 10μm , then the charge density on plate is	17.7μC/m2
18	A ring of radius 3 cm has a soap film which is getting evaporated. Light of wavelength λ=580 nm gives minimum transmission every 12 s. Find the rate of evaporation. (Refractive index=1.45)	15π x10 -13 m3/s
19	The figure shows a conducting rod sliding on two conducting rails having angle (θ = 60°) in a uniform magnetic field with a constant velocity V. Find n if the motional emf E various with time as E = ctn. 	1