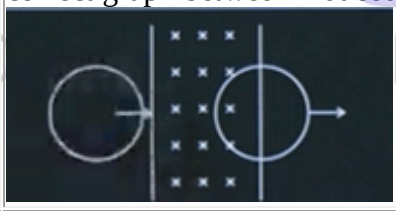
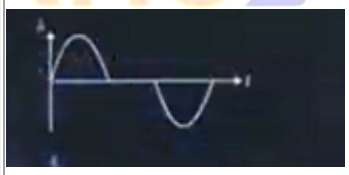
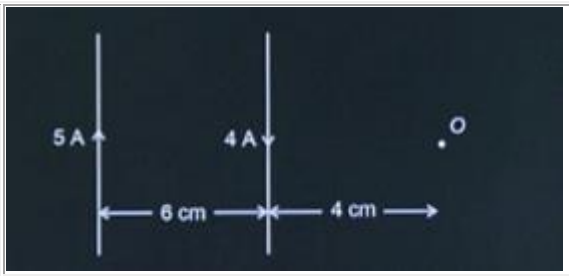
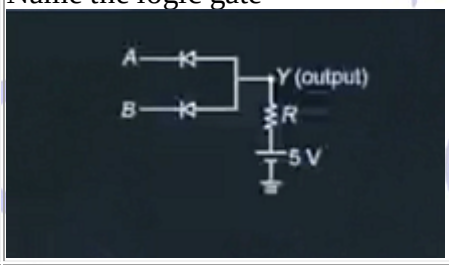
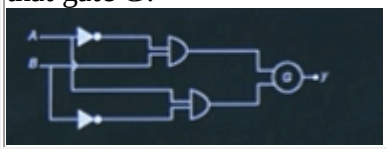
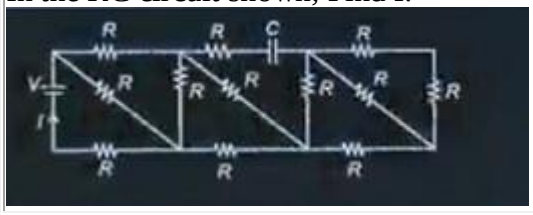
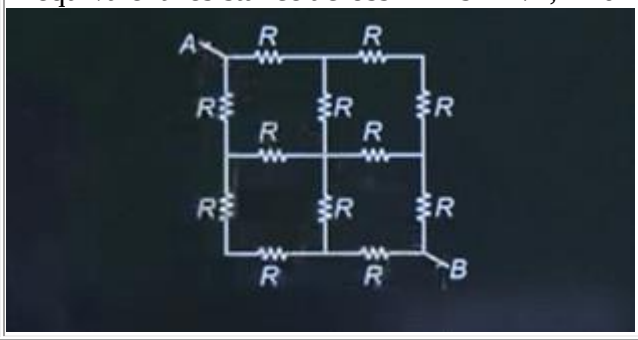
JEE MAIN 22 JANUARY 2025 SHIFT 2

PHYSICS QUESTION PAPER WITH ANSWER KEY

Q.No.	Question	Answers
1.	An Equiconvex lens of focal length f is cut into four parts as shown in the diagram. The focal length of each part is.	2f
2.	Radius of a tube decreases from 2R to R in which ideal liquid is flowing at same level. Speed at one end is 2m/s as shown, find speed v at the other end.	8m/s
3.	The dimensional formula of capacitance is	(C)=(M−1L−2T4A2)
4.	A proton is moving with uniform velocity of 2 x 10^8 m/s in uniform magnetic and electric fields which are perpendicular to each other. If electric field is switched off then proton moves in circular path of radius 1.6 x 10-^{5} m. Then magnetic field is B.	1.2 x 10^5 T
5.	The displacement of a particle moving under a action of a force F = 2i + bj+ k is d= i + j+ k. Find the value of b if the work done by the force is zero.	-3
6.	A projectile is fired with speed of 20 m/s at angle of 60 degree with horizontal. The speed at highest point of trajectory is x m/s then x is	10 m/s
7.	A conducting circular ring is moving with a constant velocity in a uniform magnetic field as shown. Identify the correct graph between induced emf vs time. 	
8.	In a series LCR circuit the maximum amplitude of current is I_0 when the resistance is R. What is the maximum amplitude of current is the resistor is replaced by a resistor of resistance R/2.	$2I_0$
9.	Statement I: Fringe width of red light is more than the fringe width of violet light. Statement II: Fringe width is directly proportional to the wavelength of light used. Choose the correct option.	Both statement I and II are correct
10.	The net magnetic field at point O due to the two infinite current carrying wires shown in the figure is	1 x 10^{-5} T

		
11.	A force F- (i + 2j-2k) N acts on point whose position vector is given as r = (2i+ 3j) + 7k) m. Find torque about origin.	(-5i + 13j + 7k) N.m
12.	Read the following statements and choose the correct option. Statement I: A pendulum is taken from Earth to another planet having mass four times and radius double than the earth. Statement II: The time period of pendulum only depends on the gravity of the planet.	Statement I is true but Statement II is false
13.	For non vibrating diatomic gas has adiabatic constant of λ_1 and for vibrating diatomic gas has adiabatic constant of λ_2 then.	$\lambda 1 > \lambda 2$
14.	Name the logic gate 	AND
15.	For a given logic circuit truth table table is given identity that gate G. 	NOR
16.	Displacement current in capacitor of area 16 cm^2 is 6 A at an instant. Find displacement current across area 3.2 cm^2	1.2A
17.	For the electric dipole shown in the figure, the electric field and the electric potential are Eq_0 V_0 at a distance r on the axis. Then what is the electric field and the electric potential at a point on the equatorial plane at a distance 2r.	$E_0/16$, 0
18.	In the RC circuit shown, Find I. 	8V/13R
19.	A glass slab of refractive index μ_0= 1.44 is coated with a	0.125λm

	thin film of refractive index μ_f= 2. The minimum thickness of the film so that maximum transmission of green light of wavelength λ= 5000A (incident normally) takes place is	
20.	If equivalent resistance across AB is NR/2, find N 	3 R/2