



TENKASI DISTRICT
Standard 12

Time Allowed : 3.00 Hrs.


PHYSICS

Maximum Marks: 70

PART - A

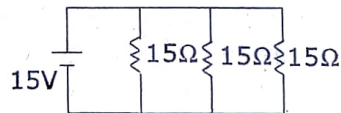
I. Choose the correct answer:

15×1=15

- A plane glass is placed over a various coloured letters (violet, green, yellow, red). The letter which appears to be raised more is _____.
a) red b) yellow c) violet d) green
- The energy required to charge a parallel plate condenser of plate separation d and plate area of cross section 'A' such that the uniform electric field between the plate is _____.
a) $\epsilon_0 A^2 E d$ b) $\epsilon_0 E^2 A d$ c) $\frac{1}{2} \epsilon_0 E^2 / A d$ d) $\epsilon_0 E^2 / A d$
- A wire of resistance 2 ohms per metre is bent to form a circle of radius 2m. The equivalent resistance between its two diametrically opposite points A and B as shown in the figure is _____.


a) $\pi \Omega$ b) $\frac{\pi}{2} \Omega$ c) $2\pi \Omega$ d) $\frac{\pi}{4} \Omega$
- The magnitude of magnetic field of a long, straight wire carrying a current of 2A at a distance of 1m from it is _____.
a) 1×10^{-7} T b) 2×10^{-7} T c) 4×10^{-7} T d) 3×10^{-7} T
- In a series resonant RLC circuit, the voltage across 100 Ω resistor is 40V. The resonant frequency ω is 250 rad/s. If the value of C is 4nF, then the voltage across 'L' is _____.
a) 600V b) 4000V c) 1V d) 400V
- unit of $(\lambda_0 \epsilon_0)^{-1/2}$ is _____.
a) Pascal b) Nm^{-1} c) ms^{-1} d) Kg m^{-1}
- When light is refracted, which of the following does not change?
a) Wavelength b) Frequency c) Velocity d) Amplitude
- Electromagnetic waves are _____.
a) Neither longitudinal nor transverse b) Longitudinal
c) Transverse d) Both longitudinal and transverse
- In an ac circuit voltage and current are given by $V = 50t$ volt and $I = 100 \sin(50t + \pi/3)$ A. The power dissipated in the circuit will be _____.
a) 1.25 kw b) 2.5 kw c) 5 kw d) 500 w
- A cyclotron can not accelerate _____.
a) electrons b) protons c) deuterons d) α -particles

- 11) The current in this circuit is _____.



- a) 4A b) 1A c) 2A d) 3A
- Dielectric strength of air is $4 \times 10^6 \text{ Vm}^{-1}$. Suppose the radius of a hollow sphere in the Van de Graff generator is $R = 0.4\text{m}$, calculate the maximum potential difference created by this Vande Graff generator is _____.
a) 1.6 million volt b) 2.6 mV c) 0.6 mV d) 3.6 mV
 - A wire of resistance 10 Ω is stretched uniformly, to thrice its original length then the resistance of stretched wire _____.
a) 90 Ω b) 70 Ω c) 50 Ω d) 30 Ω
 - The ratio of magnetic length and geometrical length is _____.
a) 0.633 b) 0.733 c) 0.833 d) 0.933

- 15) When the current changes from 2A to -2A in 0.05s, an emf of 8V is induced in a coil. The co-efficient of self-induction of the coil is _____.
- a) 0.2H b) 0.4H c) 0.8H d) 0.1H

PART - II**II. Answer any six of the following.****6×2=12****Question number 21 is compulsory.**

- 16) Define static potential.
- 17) What is Peltier effect?
- 18) Write the uses of mass spectrometer.
- 19) State Len's law.
- 20) Compute the speed of electromagnetic waves in a medium if the amplitudes of electric and magnetic fields in it are $3 \times 10^4 \text{ NC}^{-1}$ and $2 \times 10^{-4} \text{ T}$ respectively.
- 21) An object is placed at a certain distances from a convex lens of focal length 20 cm. Find the object distance if the image obtained is magnitude 4 times.
- 22) State Malu's law.
- 23) Write the condition of Total internal reflection.
- 24) Why sky appears blue?

PART - III**III. Answer any six of the following.****6×3=18****Question number 27 is compulsory.**

- 25) Write the application of capacitor.
- 26) When two resistors connected in series and parallel their equivalent resistances are 15Ω , $\frac{56}{15}\Omega$ respectively. Find the two resistors.
- 27) A wire of length l carrying a current I along the y direction is kept in a magnetic field is given by $B = \frac{\beta}{\sqrt{3}}(\vec{i} + \vec{j} + \vec{k})T$. Calculate the magnitude of Lorentz force acting on the wire.
- 28) Obtain an expression for Q-factor.
- 29) Write short notes on Ampere's Maxwell law.
- 30) What is optical path? Obtain the equation for optical path.
- 31) Differentiate between Fresnel and Frannhofer diffraction.
- 32) Obtain Gauss law form Columb's law.
- 33) Obtain the condition for bridge balance in Wheatston's bridge.

PART - IV**IV. Answer all questions:****5×5=25**

- 34) Explain in detail the effect of a dielectric placed in a parallel plate capacitor.
(OR)
Explain in detail about absorption spectra.
- 35) Describe the microscopic model of current and obtain general form of ohm's law.
(OR)
Explain Fizean's method to determine the speed of light.
- 36) Derive the expression for the force between two parallel, current carrying conductors.
(OR)
Obtain the equation for bandwidth in young's double slit experiment.
- 37) Explain the construction and working of transformer.
(OR)
Obtain len's maker's formula and mention its significance.
- 38) Write down Maxwell's equations in integral form.
(OR)
Discuss the working of cyclotron in detail.



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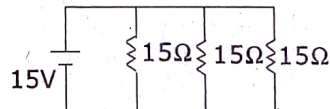
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