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VNR12P

Virudhunagar District First Revision Exam, January - 2025

Marks: 70

Standard 12 PHYSICS

Time: 3.	no Hrs. PHYSICS
1111161 3.	Part - I 15×1=15
Answer	all the questions:
1)	all the questions: If voltage applied on a capacitor is increased from V to 2V, choose the correct conclusion a) 'Q' remains the same, 'C' is doubled b) 'Q' is doubled, 'C' is doubled c) 'C' remains same, 'Q' is doubled
2)	d) Both 'Q' and 'C' remain same An electric field in a region is given by $(6\hat{i} + 5\hat{j} + 3\hat{k})^{N}/C$. The electric flux
	through a surface area $30\hat{i}$ m ² lying in the y-z plane is a) $100 \text{ Nm}^2\text{C}^{-1}$ b) $180 \text{ Nm}^2\text{C}^{-1}$ c) $90 \text{ Nm}^2\text{C}^{-1}$ d) $60 \text{ Nm}^2\text{C}^{-1}$
	A toaster operating at 240 V has a resistance of 120 Ω. Its power is a) 400 w b) 2 w c) 480 w d) 240 w
4)	A carbon resistor of (47 ± 4.7) K Ω to be marked with rings of different colours for its identification. The colour code sequence will be a) yellow-green-violet-gold b) yellow-violet-orange-silver c) violet-yellow-orange-silver d) green-orange-violet-gold
5)	In the circuit given below, the ideal ammeter reads 0.9 A. The value of 'R' is \rightarrow \rightarrow a) 20Ω b) 10Ω
6)	A circular coil of radius 5 cm and 50 turns carries a current of 3 ampere. The magnetic dipole moment of the coil is nearly
7)	If a charged particle moves in a region of uniform magnetic field such that its velocity is not perpendicular to the magnetic field, the path of the charged particle inside the field is
8)	a) circular b) straight line c) elliptical d) helical In a transformer, the number of turns in the primary and the secondary are 410 and 1230 respectively. If the current in primary is 6A, then the current in the secondary coil is
	a) 2A b) 18A c) 12A d) 1A In an oscillating LC circuit the maximum charge on the capacitor is 'Q'. The charge on the capacitor when the energy is stored equally between the electric and magnetic fields is
	a) $\frac{Q}{2}$ b) $\frac{Q}{\sqrt{3}}$ c) $\frac{Q}{\sqrt{2}}$ d) Q
10)	In a coil, current changes from -2A to +2A in 0.2 s and induces an emf of 0.1V. The self-inductance of the coil is
11)	a) 5 mH b) 1 mH c) 2.5 mH d) 0.1 mH Fraunhofer lines are an example of a) line emission spectrum b) line absorption spectrum
	c) band emission spectrum d) band absorption spectrum
	Which of the following electromagnetic radiations is used for viewing objects through fog
13)	a) microwave b) gamma rays c) x-rays d) infrared The source of time varying magnetic field may be

b) an electric field changing linearly withtime

d) direct current

a) a permanent magnet

c) a deceleraling charged particle

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- 14) The speed of light in an isotropic medium depends on
 - a) its intensity

b) its wavelength

c) the nature of propagation d) the motion of the source w.r.t. medium 15) When a biconvex lens of glass having refractive index 1.47 is dipped in a

liquid, it acts as a plane sheet of glass. This implies that the liquid must have refractive index

a) less than one

- b) less than that of glass
- c) greater than that of glass d) equal to that of glass

Part - II

Answer any six questions. Question no. 24 compulsorily:

6×2=12

16) Define electrostatic potential at a point.

- 17) Consider a point charge +q placed at the origin and another point charge -2q placed at a distance of 9 m from the charge +q. Determine the point between the two charges at which electric potential is zero.
- 18) What is Thomson effect?

19) State Fleming's left hand rule.

20) Calculate the magnitude of the magnetic field of a infinitely long, straight wire carrying current of 1A at a distance of 1 m from it.

21) What are step-up and step-down transformers.

22) What is displacement current?

23) Why does sky appear blue?

24) Refractive index of water is 1.33. What is the speed of light through water?

Part - III

Answer any six questions. Question no. 33 compulsorily:

6×3=18

25) Obtain the expression for energy stored in a capacitor.

26) State and explain Kirchoff's first law.

27) Mention the differences between dia magnetism and para magnetism.

28) Explain the various energy losses in a transformer.

29) A capacitor of capacitance $\frac{10^2}{\pi} \mu F$ is connected across a 220 V, 50 Hz A.C. mains. Calculate the RMS value of the current through the circuit.

30) Write a note on ultra violet rays.

31) If the relative permeability and relative permittivity of a medium are 1.0 and 2.25 respectively, find the speed of electromagnetic wave in this medium.

32) Obtain the expression for lateral magnification in thin lens.

33) The resistance of a wire is 20Ω . What will be the new resistance, if it is stretched uniformly 8 times its original length?

Part - IV

Answer all the questions:

34) a] Obtain the expression for electric field due to an infinitely long charged wire by using Gauss' Law.

(OR)

- b] Obtain the expression for dispersive power of the material of the prism.
- 35) a Describe the principle, construction and working of Van de Graff Generator. (OR)
 - b] Obtain the expression for the force between two parallel, current carrying conductors.
- 36) a] How will you determine the internal resistance of a cell using potentio meter? (OR)

b] Obtain Lens Maker's formula and Lens equation.

37) a Obtain the expression for magnetic field at a point on the axial line of a bar magnet. (OR)

b] Write and explain Maxwell's equations in integral form.

38) a] Find out the phase relationship between voltage and current in a pure inductive a.c. circuit. Draw the phasor diagram.

(OR)

bl Describe the various types of emission spectrum.