T **COMMON FIRST REVISION TEST - 2025**

Standard - XII   Reg.No. | 2 | 4 | 1 | 9 | | |

Time: 3.00 hrs.   **PHYSICS**   *Marks: 70*

PART - A

I. **Answer all the questions:**   15×1=15

1) If a capacitor placed in castor oil, the value of relative permittivity is
   a) 0.1   b) 0.5   c) less than one   d) greater than one

2) An example of non polar molecule of the following
   a) H_2O b) N_2O c) NH_3 d) O_2

3) Van de Graff Generator works on the principle of
   a) Electro static induction   b) Action of points
   c) a and b   d) a only

4) A carbon resistor of value 75 KΩ. The colour code sequence will be
   a) Violet - Green - Orange - Gold   b) Violet - Yellow - Orange - Silver
   c) Yellow - Green - Violet - Gold   d) Green - Violet - Orange - Gold

5) The temperature coefficient of resistance of a wire is 0.00125 per°C.
   At 20°C, its resistance is 1Ω. The resistance of the wire will be 2Ω at
   a) 800°C   b) 700°C   c) 850°C   d) 820°C

6) A non conducting charged ring carrying a charge of q, mass m and radius
   r is rotated about its axis with constant angular speed w. Find the ratio of
   its magnetic moment with angular momentum is
   a) q/m   b) 2q/m   c) q/2m   d) q/4m

7) The potential energy of magnetic dipole whose dipole moment is

   $\bar{P}m = (-0.5\hat{i} + 0.4\hat{j})Am^2$ kept in uniform magnetic field $\vec{B} = 0.2\hat{i}T$.
   a) −0.1J   b) −0.8J   c) 0.1J   d) 0.8J

8) When a current carrying conductor is placed in a magnetic field, the direction
   of the force experienced by its given by
   a) Right hand thumb rule   b) Tangent law
   c) Fleming's left hand rule   d) Ampere's circuital law

9) 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 that in the
   secondary coil is
   a) 2A   b) 18A   c) 12A   d) 1A

10) An inductor 20 mH, a capacitor 50μF and a resistor 40Ω are connected in
    series across a source of emf V = 10 sin340t. The power loss in AC circuit is
    a) 0.76W   b) 0.89W   c) 0.46W   d) 0.67W

11) The equation for an alternating current is given by i = 77 sin314t. Then the
    value of frequency is
    a) 100 Hz   b) 50 Hz   c) 25 Hz   d) 45 Hz

12) The dimension of $\frac{1}{\mu_0\varepsilon_0}$ is

    a) $[LT^{-1}]$ b) $[L^2T^{-2}]$ c) $[L^{-1}T]$ d) $[L^{-2}T^2]$

13) Which of the following electromagnetic radiations is used for viewing objects
    through fog
    a) microwave   b) gamma rays   c) x-rays   d) infrared

14) For light incident from air on a slab of refractive index 2, the maximum
    possible angle of refraction is
    a) 30°   b) 45°   c) 60°   d) 90°

15) Stars twinkle due to
    a) reflection   b) total internal reflection
    c) refraction   d) polarisation

PART – B

II. Answer any six questions. Question No. 24 is compulsory: 6×2=12

16) Define electrostatic potential.
17) Define capacitance. Give its unit.
18) State Joule's law of heating.
19) In a wheatstone's bridge $P = 100\Omega$, $Q = 1000\Omega$ and $R = 40\Omega$. If the galvanometer shows zero deflection, determine the value of S.
20) State Tangent law.
21) What are paraxial rays and marginal rays?
22) Mention the ways of producing induced emf.
23) Write a notes on Gauss law in magnetism.
24) A conducting rod of length 0.5m falls freely from the top of a building of height 7.2m at a place in Chennai. Where the horizontal component of Earth's magnetic field is 4.04×10^{-5}T. If the length of the rod is perpendicular to Earth's horizontal magnetic field, find the emf induced across the conductor when the rod is about to touch the ground. (Assume that the rod falls down with constant acceleration of 10 ms^{-2}).

PART – C

III. Answer any six questions. Question No. 33 is compulsory: 6×3=18

25) What are the properties of electric field lines?
26) Explain the equivalent resistance of a parallel resistor network.
27) Distinguish between drift velocity and mobility.
28) What are the features of magnetic Lorentz force?
29) Suppose a cyclotron is operated to accelerate protons with a magnetic field of strength 17. Calculate the frequency in which the electric field between two Dees could be reversed.
30) Derive the equation for energy stored in an inductor.
31) Write the uses of Radio waves and microwaves.
32) Obtain the equation for critical angle.
33) What is the focal length of the combination if the lenses of focal lengths –70 cm and 150 cm are in contact? What is the power of the combination?

PART – B

IV. Answer all the questions: 5×5=25

34) Derive an expression for electrostatic potential due to a point charge.
(OR)
Discuss the the working of cyclotron in detail.
35) Describe the microscopic model of current and obtain general form of ohm's law.
(OR)
Derive the equation for self inductance of a long solenoid.
36) Derive the expression for the force between two parallel, current carrying conductors.
(OR)
Explain the types of absorption spectrum.
37) Obtain the expression for electric field due to an uniformly charged spherical shell.
(OR)
Obtain lens maker's formula and mention its significance.
38) Explain the construction and working of transformer.
(OR)
Derive the equation for angle of deviation produced by a prism.