Ts12P

Tenkasi District Common Examinations
Common Half Yearly Examination - December 2022

Standard 12

PHYSICS

Time Allowed: 3.00 Hours Maximum Marks: 70

PART - I

Answer all questions: **15×1=15**

1) An electric dipole is placed at an alignment angle of 30° with an electric field of 2×10^5 NC^{-1}. It experiences a torque equal to 8 Nm. The charge on dipole if the dipole length is 1 cm is
a) 8 mc b) 5 mc c) 7 mc d) 4 mc

2) n equal capacitors of capacitance C is connected in series. The effective capacitance is
a) C/n b) nc c) C/n d) c

3) A toaster operating at 240V has a resistance of 120Ω. Its power is
a) 400W b) 2W c) 480W d) 240W

4) The magnetic field at a point of 15 cm from current carrying long straight conductor is 4×10^{-6} T. The current flows through the conductor is
a) 2A b) 6A c) 4A d) 3A

5) 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 field is
a) $\frac{Q}{2}$ b) $\frac{Q}{\sqrt{3}}$ c) $\frac{Q}{\sqrt{2}}$ d) Q

6) In a stepup transformer input voltage is 220V and output voltage is 11000V. The ratio of number of turns in primary and secondary is
a) 1:50 b) 50:1 c) 25:1 d) 1:25

7) Which of the following spectrum is used to study about structure of molecules?
a) Band emission spectrum b) Continous emission spectrum
c) Line emission spectrum d) Band absorption spectrum

8) Star twinkle due to
a) reflection b) polarisation
c) total internal reflection d) refraction

9) Two coherent monochromatic light beam of intensities I and 4I are superposed. The maximum and minimum possible intensities in the resulting beam are
a) 9I and 3I b) 5I and 3I c) 9I and I d) 5I and I

10) In electron microscope the electrons are accelerated by 14 KV potential difference. If the accelerating potential difference increases to 224 KV, the de-Broglie wavelength of electron will be
a) increased by 2 times b) decreased by 4 times
c) increased by 4 times d) decreased by 2 times

11) The nucleus is approximately spherical in shape. When the surface area of nucleus having mass number A varies as
a) $A^{1/3}$ b) $A^{2/3}$ c) $A^{4/3}$ d) $A^{5/3}$

12) The potential barrier of silicon is (approximately)
a) 2.0V b) 1.1V c) 0.7V d) 0.3V

13) "Ski wax" is an application of nano product in the field of
a) Sports b) Textile
c) Medicine d) Automotive industry

14) In Millikan oil drop experiment, the direction of viscous force
a) acts always downward b) acts always upward
c) acts opposite to direction of movement of oil drop
d) acts along the direction of movement of oil drop

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15) When an electron jumps from M shell to K shell, the spectre lines,
a) Kα line b) Kβ line c) Lα line d) Lβ line

PART - II

Answer any 6 questions. Qn.no. 24 is compulsory: **6×2=12**

16) What is Carona discharge?
17) Give properties of para magnetic substance.
18) Define Q-factor.
19) Electromagnetic waves are not mechanical wave. Why?
20) The angle minimum deviation of equilateral prism is 37°. Calculate refractive index of material of prism.
21) Give the applications of RADAR.
22) What are isotone? Give example.
23) Distinguish Fresnel and Fraunhofer diffraction.
24) If the resistance of coil is 3Ω at 20°C and α = 0.004/°C the determine its resistance at 100°C.

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PART - III

Answer any 6 questions. Qn.no. 33 is compulsory: **6×3=18**

25) The equation for an alternating current is given by i = 77 sin 314t. Find the peak current, frequency and time period.
26) How is galvanometer is converted into ammeters?
27) Deduce an expression for capacitance of parallel plate capacitor.
28) State and prove De-Margon Theorems.
29) Obtain Einstein's photo electric equation with necessary explanation.
30) State and prove Brewster's law.
31) Obtain the expression for equivalent resistance when the resistors are connected in series.
32) Calculate time required for 60% of a sample of radon undergoes decay. Given $T_{1/2}$ of radon = 3.8 days
33) i) Why does sky appear blue?
ii) What is the reason for reddish appearance of sky during sunset and sunrise?

PART - IV

Answer ALL questions: **5×5=25**

34) a) Explain in detail the construction and working of a Van de Graaff generator.
(OR)
b) Discuss about the simple microscope and obtain the equations for magnification for near point focusing and normal focusing.
35) a) Derive the expression for force on the current carrying conductor in a magnetic field.
(OR)
b) How the emf of two cells are compared using potentiometer?
36) a) Derive the mirror equation adn the equation for lateral magnification.
(OR)
b) Explain the construction and working of full wave rectifier with diagram.
37) a) Explain the method of producing induced emf by changing relative orientation of the coil with the magnetic field.
(OR)
b) Describe briefly Davisson - Germer experiment which demostrated the wave nature of electron.
38) a) What is electro magnetic wave? Give any six properties of electromagnetic wave.
(OR)
b) Derive the radius of the orbit of the electron and velocity of the electron in hydrogen atom using Bohr atom model.
