Tenkasi District Common Examinations
Second Revision Test - January 2023

01-02-2023

Standard 12

PHYSICS

Time Allowed: 3.00 Hours | Maximum Marks: 70

PART - I

15×1=15

Answer ALL the questions:

1) Which charge configuration produces a uniform electric field?
a) Point charge
b) Uniformly charged infinite line
c) Uniformly charged infinite plane
d) Uniformly charged spherical shell

2) A carbon resistor of (47±4.7) KΩ 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

3) The magnitude of the magnetic field of a long straight wire carrying a current of 1A at a distance of 1m from it.
a) 2×10^{-7} T
b) 2×10^{-5} T
c) $4\pi\times10^{-7}$ T
d) $2\pi\times10^{-7}$ T

4) 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

5) Fraunhofer lines are an example of ..... spectrum.
a) line emission
b) line absorption
c) band emission
d) band absorption

6) Stars twinkle due to
a) Reflection
b) Total internal reflection
c) Refraction
d) Polarisation

7) For a healthy eye, the distance of the near point is .....
a) 30 cm
b) 20 cm
c) 35 cm
d) 25 cm

8) If the wavelength λ_e of an electron and λ_p of photon of same energy, then λ_e and λ_p is related by
a) $\lambda_p \propto \lambda_e$
b) $\lambda_p \propto \sqrt{\lambda_e}$
c) $\lambda_p \propto \frac{1}{\sqrt{\lambda_e}}$
d) $\lambda_p \propto \lambda_e^2$

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

10) If the input to the NOT gate is A = 1011, its output is
a) 0100
b) 1000
c) 1100
d) 0011

11) If a positive half-wave rectified voltage is fed to a load resistor, for which part of a cycle there will be current flow through the load?
a) 0° – 90°
b) 90° – 180°
c) 0° – 180°
d) 0° – 360°

12) Atomic number of H-like atom with ionization potential 122.4V for n=1 is
a) 1
b) 2
c) 3
d) 4

13) Two metallic spheres of radii 1 cm and 3 cm are given charges of -1×10^{-2} C and 5×10^{-2} C respectively. If these are connected by a conducting wire, the final charge on the bigger sphere is
a) 3×10^{-2} C
b) 4×10^{-2} C
c) 1×10^{-2} C
d) 2×10^{-2} C

14) $\frac{20}{\pi^2}$ H inductor is connected to a capacitor of capacitance C. The value of C in order to impart maximum power at 50 Hz is
a) 50 μF
b) 0.5 μF
c) 500 μF
d) 5 μF

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15) Aray of light travelling in a transparent medium of refractive index n falls, on the surface separating the medium from air at an angle of incidents of 45°. The ray can undergo total internal reflection for the following n,
a) n = 1.25 b) n = 1.33 c) n = 1.4 d) n = 1.5

PART - II

Answer ANY SIX questions. Question No. 24 is compulsory: **6×2=12**

16) Mention the ways of producing induced emf.
17) Define Electrostatic potential.
18) An ideal transformer has 460 and 40000 turns in the primary and secondary coils respectively. Find the voltage developed perturn of the secondary coil if the transformer is connected to a 230V AC mains.
19) Distinguish between avalanche breakdown and zener breakdown.
20) Define Curie.
21) Define stopping potential.
22) List the uses of polaroids.
23) State Ampere's circuital law.
24) Pure water has refractive index 1.33. What is the speed of the light through it?

PART - III

Answer ANY SIX questions. Question No. 33 is compulsory: **6×3=18**

25) Obtain Gauss law from Coulomb's law.
26) Two resistors when connected in series and parallel, their equivalent resistances are 15Ω and $\frac{56}{15}$ Ω respectively. Find the values of the resistances.
27) Explain the conversion of galvano meter into volt meter.
28) Explain production of induced emf by changing the area of the coil.
29) Derive Focal length of two lenses incontact.
30) State and explain Brewster's Law.
31) What are the applications of photo cells?
32) Discuss the alpha decay process with example.
33) In a transistor connected in the common base configuration α = 0.95, I_E = 1mA. Calculate I_C and I_B.

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PART - IV

Answer ALL the questions: **5×5=25**

34) a) Derive the Electric field due to a dipole on its equatorial plane.

(OR)

b) Describe the Fizeau's method to determine the speed of light.

35) a) Explain Maxwell's modification of Ampere's circuital law.

(OR)

b) Obtain the law of radioactivity.

36) a) Explain the construction and working of a full wave rectifier.

(OR)

b) Discuss the working of cyclotron in detail.

37) a) Describe the microscopic modal of current and obtain general form of Ohm's law.

(OR)

b) Discuss about the simple microscope and obtain the equations for magnification for near point focusing and normal focusing.

38) a) Briefly explain the principle and working of electron microscope.

(OR)

b) Explain AC circuit containing only an inductor.
