TNJ

FIRST REVISION TEST - 2023

XII - Std

PHYSICS

Time : 3.00 Hrs

Marks : 70

PART - I

Note : Answer all the questions. Choose the best answer with symbol :- 15 X 1 = 15

1. 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 doubled
   c) C remains same, Q doubled
   d) Both Q and C remain same

2. In Joule's heating law, when R and t are constant, if H is taken along the y axis and I^2 along the x axis, the graph is
   a) Straight line
   b) Parabola
   c) Circle
   d) Ellipse

3. When the car engine is started with headlights turned on, they sometimes become dim. This is due to the ..... of the car battery.
   a) emf
   b) internal resistance
   c) Voltage
   d) Resistance

4. A bar magnet of length and magnetic moment Pm is bent in the form of an arc as shown in figure. The now magnetic moment will be.
   a) P_m
   b) $\frac{3}{\pi} P_m$
   c) $\frac{2}{\pi} P_m$
   d) $\frac{1}{2} P_m$

5. Write down the equation for a sinusoidal voltage of 25 Hz and its peak value is 10V.
   a) 10 sin 20t
   b) 20 sin 10t
   c) 20 sin 157t
   d) 10 sin 157t

6. A step - down transformer reduces the supply voltage from 220V to 11V and increase the current from 6A to 100A. Then its efficiency is.
   a) 0.83
   b) 0.9
   c) 1.2
   d) 0.12

7. Fraunhofer lines are an example of ..... spectrum.
   a) Line emission
   b) Band emission
   c) Band absorption
   d) Line absorption

8. In the cold places the refractive index ..... towards the ground.
   a) decreases
   b) increases
   c) remains same
   d) increases then decreases

9. The transverse nature of light is shown in
   a) interference
   b) diffraction
   c) scattring
   d) polarization

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

11. ..... is measured by the smallest distance which could be seen clearly without the blue to diffraction.
    a) Closest approach
    b) astronomical unit
    c) Resolution
    d) Fresnel's distance

12. The threshold frequency for a metal surface whose photoelectric work function is 3.313eV is
    a) 8×10^{14} Hz
    b) 6000 Hz
    c) 3750Hz
    d) 2062Hz

13. ${}^{12}_{5}B \rightarrow {}^{12}_{6}C + \bar{e} + X$. In the above equation x represents.

a) $2H^4_e$ b) ν c) e^+ d) $\bar{\nu}$

14. The principle based on which a solar cell operates is

a) Diffusion b) Recombination c) Photovoltaic action d) Carrier flow

15. The particle which gives mass to protons and neutrons are

a) Einstein particle b) Bulk particle c) Higgs particle d) Nano particle

PART - II

Note : 1. Answer any six of the following only. 2. Q.No. 24 is compulsory :- 6 X 2 = 12

16. What is electric polarisation?
17. A potential difference across 24Ω resistor is 2.4V. What is the current through the resistor?
18. State Biot - Savart law.
19. Define average value of an alternating current.
20. What is Rayleigh's criterion?
21. The relative magnetic permeability of the medium is 2.5 and the relative electrical permitivity of the medium is 2.25. Compute the refractive index of the medium.
22. What is photo electric cell? Give their types.
23. Define impact parameter.
24. Find the power of a lens whose focal length is 150 cm?

PART - III

Note : 1. Answer any six of the following only. 2. Q.No. 33 is compulsory :- 6 X 3 = 18

25. A parallel plate capacitor has square plates of sides 5cm and separated by a distance of 1mm. (a) Calculate the capacitance of this capacitor. (b) If a 10V battery is connected to the capacitor, What is the charge stored in axy one of the plates? $(\varepsilon_O = 8.854\ X\ 10^{-12}\ N^{-1}m^{-2}C^{-2})$
26. Explain the determination of the internal resistance of a cell using voltmeter.
27. Give an account of magnetic Lorentz force.
28. Write the advantages and disadvantages of AC over DC.
29. Differentiate polarized light and unpolarised light.
30. Write a note on characteristic X-ray spectra.
31. What are the possible harmful effects of usage of Nanoparticles? Why?
32. Discuss the gamma emission process with example.
33. In a transistor connected in the common base configuration, $\alpha = 0.95$ I_E = 1mA. Calculate the value of I_C and I_B.

PART - IV

Note : Answer all the questions :- 5 X 5 = 25

34. a) Explain in detail the construction and working of a Van de Graff generator. ***(OR)***
    b) What is electron emission? Explain the various methods of electron emission.
35. a) Describe the microscopic model of current and obtain general form of Ohm's law. ***(OR)***
    b) Obtain the equation for radius of illumination (or) Snell's window.
36. a) Discuss the working of cyclotron in detail. ***(OR)***
    b) Explain the construction, working and applications of Light emitting diode (LED).
37. a) Find out the phase relationship between voltage and current in a pure inductive circuit. ***(OR)***
    b) Explain the experimental determination of refractive index of the prism using spectrometer.
38. a) Explain the Maxwell's modification of Ampere's circuital law. ***(OR)***
    b) Derive the energy expression for an electron in the hydrogen atom using Bohr atom model.