

SECOND MID TERM TEST - 2024

Standard XII

Reg.No.

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PHYSICS

Part - I

Time : 1.30 hrs

Marks : 50
10 x 1 = 10

I. Choose the correct answer:

1. The transverse nature of light is shown in
 - a) interference
 - b) diffraction
 - c) scattering
 - d) polarisation
2. Light transmitted by Nicol prism is
 - a) partially polarised
 - b) unpolarised
 - c) plane polarised
 - d) elliptically polarised
3. Type of material which emits white light in LED:
 - a) GaInN
 - b) SiC
 - c) AlGaP
 - d) GaAsP
4. First diffraction minimum due to a single slit of width 1.0×10^{-5} cm is at 30° . Then wavelength of light used is
 - a) 400 \AA
 - b) 500 \AA
 - c) 600 \AA
 - d) 700 \AA
5. In Bohr atom model when the principal quantum number (n) increases the velocity of electron
 - a) increases and then decreases
 - b) increases
 - c) decreases
 - d) remains constant
6. The wavelength λ_e of an electron and λ_p of a photon of same energy E are 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) $\lambda_p \propto \lambda_e^2$
7. The threshold wavelength for a metal surface whose photoelectric work function is 3.313 eV is
 - a) 4125 \AA
 - b) 3750 \AA
 - c) 6000 \AA
 - d) 2062 \AA
8. Emission of electrons by the absorption of heat energy is called _____ emission.
 - a) photoelectric
 - b) field
 - c) thermionic
 - d) secondary
9. The charge of cathode rays particle is
 - a) positive
 - b) negative
 - c) neutral
 - d) not defined
10. A light of wavelength 500 nm is incident on a sensitive metal plate of photo electric work function 1.235 eV. The kinetic energy of the photo electrons emitted is ($h = 6.6 \times 10^{-34}$ JS)
 - a) 0.58 eV
 - b) 2.48 eV
 - c) 1.24 eV
 - d) 1.16 eV

Part - II

II. Answer any 5 questions. (Q.No.14 is compulsory)

5 x 2 = 10

11. State Brewster's law.
12. Mention the difference between interference and diffraction.

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13. Define : Work function of a metal. Give its unit.
14. Calculate the momentum of an electron with kinetic energy 2 eV.
15. State Malus law.
16. Define : Stopping potential
17. What is meant by excitation energy?
18. Calculate the radius of $^{197}_{79}\text{Au}$

Part - III

III. Answer any 5 questions. (Q.No.20 is compulsory)

5 x 3 = 15

19. Differentiate between Fresnel and Fraunhofer diffraction.
20. The ratio of maximum and minimum intensities in an interference pattern is 36:1. What is the ratio of the amplitude of the two interfering waves?
21. List of uses of polaroids.
22. Derive an expression for de-Broglie wavelength of electrons.
23. List out the characteristics of photons.
24. Write a note in applications of X-ray in
 - i) Industries
 - ii) Scientific research
25. Discuss the alpha decay process with an example.
26. Write the properties of cathode rays.

Part - IV

IV. Answer all the questions.

3 x 5 = 15

27. a) Obtain the law of radioactivity.

(OR)

- b) Obtain Einstein's photo electric equation with the necessary explanation.

28. a) Discuss the spectral series of hydrogen atom.

(OR)

- b) Obtain the equation for bandwidth in Young's double slit experiment.

29. a) Describe briefly Davisson-Germer experiment which demonstrated the wave nature of electrons.

(OR)

- b) Explain about compound microscope and obtain the equation for magnification.
