



V12P

Second Mid Term Test - 2023

Standard 12

PHYSICS

Part - I

Time: 1.30 Hours

Marks: 50

Note: i) Answer all the questions 10×1=10
 ii) Choose the most appropriate answer from the given four alternatives and write the option code and the corresponding answer.

- 1) In a hydrogen atom, the electron revolving the fourth orbit has angular momentum equal to
 a) h b) $\frac{h}{\pi}$ c) $\frac{4h}{\pi}$ d) $\frac{2h}{\pi}$
- 2) What happens to the half-life of a radioactive substance as it decays
 a) it decreases b) it increases
 c) it remains constant d) none of these
- 3) The charge of cathode rays particle is
 a) Positive b) negative c) neutral d) not defined
- 4) The threshold wavelength for a metal surface whose photoelectric work function 3.313eV is
 a) 4125 \AA b) 3750 \AA c) 6000 \AA d) 2062.5 \AA
- 5) If the nuclear radius of ^{27}Al is 3.6 fermi, the approximate nuclear radius of ^{64}Cu in fermi is
 a) 2.4 b) 1.2 c) 4.8 d) 3.6
- 6) If the momentum of a particle is increased to four times, then the de Broglie wavelength will become
 a) Two times b) four times c) 0.25 times d) 0.5 times
- 7) The momentum of a photon is $3.3 \times 10^{-29} \text{ kgms}^{-1}$. Its frequency will be
 a) $3 \times 10^3 \text{ Hz}$ b) $6 \times 10^3 \text{ Hz}$ c) $7.5 \times 10^{12} \text{ Hz}$ d) $1.5 \times 10^{13} \text{ Hz}$
- 8) Millikan's oil drop experiment gives the value of
 a) e b) e/m c) exm d) m
- 9) Which type of light waves can be polarized
 a) Radio waves b) Transverse waves
 c) Sound waves d) Infrared waves
- 10) First diffraction minimum due to a single slit of width $1.0 \times 10^{-5} \text{ cm}$ is at 30° . Then wavelength of light used is
 a) 400 \AA b) 500 \AA c) 600 \AA d) 700 \AA

Kindly send me your answer keys to us - padasalai.net@gmail.com

Answer any six questions.

6×2=12

Answer the question 18 compulsory.

- 11) What is interference of light?
- 12) List the uses of polaroids.
- 13) State Brewster's law
- 14) How will you define threshold frequency?
- 15) Define stopping potential
- 16) Define the Ionization energy and ionization potential.
- 17) The radius of the 5th orbit of hydrogen atom is 13.25 \AA . Calculate the de Broglie wavelength of the electron orbiting in the 5th orbit.
- 18) Calculate the momentum and the de Broglie wavelength of an electron with Kinetic energy 2 eV.

Part - III

Answer any six of the following questions.

6×3=18

Answer the question 26 compulsory.

- 19) Write the properties of cathode rays.
- 20) What is half-life of a radio active nucleus? Give the expression.
- 21) State - de Broglie hypothesis.
- 22) Give any three applications of X- rays.
- 23) Differentiate between polarised and unpolarised light.
- 24) Calculate the power of the lens of the spectacles needed to rectify the defect of near sightedness for a person who could see clearly up to a distance of 1.8 m.
- 25) Discuss about Nicol prism.
- 26) A radiation of wavelength 300 nm is incident on a silver surface. Will photoelectrons be observed?
[Work function of silver = 4.7 eV]

Part - IV

Answer the following questions in detail.

2×5=10

- 27) What is photo electric cell? Give the construction and working of photo emissive cell.

(OR)

Discuss the millikan's oil drop experiment to determine the charge of an electron.

- 28) Explain the J.J. Thomson experiment to determine the specific charge of electron (Deflection of charge only due to uniform electric field)

(OR)

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