



20-11-2023

## Standard 12

Time: 1.30 Hours

## PHYSICS

Marks: 35

## I. Choose the correct answer.

10×1=10

- 1) Find diffraction minimum due to a single slit of width  $1.2 \times 10^{-7}$  m is at  $30^\circ$ . Then wavelength of light used is  
 a)  $400 \text{ \AA}$                       b)  $500 \text{ \AA}$                       c)  $600 \text{ \AA}$                       d)  $700 \text{ \AA}$
- 2) The transverse nature of light is shown in  
 a) interference                      b) diffraction                      c) Scattering                      d) Polarisation
- 3) A particle of mass  $3 \times 10^{-6}$  g has the same wavelength as an electron moving with a velocity  $6 \times 10^6 \text{ ms}^{-1}$ . The velocity of the particle is  
 a)  $1.82 \times 10^{-18} \text{ ms}^{-1}$                       b)  $9 \times 10^{-2} \text{ ms}^{-1}$   
 c)  $3 \times 10^{-31} \text{ ms}^{-1}$                       d)  $1.82 \times 10^{-15} \text{ ms}^{-1}$
- 4) The threshold wavelength for a metal surface whose photoelectric work function is 3.313 eV is  
 a)  $4125 \text{ \AA}$                       b)  $3750 \text{ \AA}$                       c)  $6000 \text{ \AA}$                       d)  $2062.5 \text{ \AA}$
- 5) Emission of electrons by the absorption of heat energy is called  
 a) photo electric emission                      b) field emission  
 c) Thermionic emission                      d) secondary emission
- 6) In a hydrogen atom the electron revolving in the second orbit has angular momentum equal to  
 a)  $h$                       b)  $\frac{h}{\pi}$                       c)  $\frac{4h}{\pi}$                       d)  $\frac{2h}{\pi}$
- 7) The ratio of the wavelengths for the transition from  $n = 2$  to  $n = 1$  in  $\text{Li}^{++}$ ,  $\text{He}^+$  and  $\text{H}$  is  
 a)  $1 : 2 : 3$                       b)  $1 : 4 : 9$                       c)  $3 : 2 : 1$                       d)  $4 : 9 : 36$
- 8) Neutrino  
 a) has zero charge  
 b) has very small mass  
 c) has an antiparticle called anti-neutrino  
 d) All the above
- 9) Cut off wavelength of continuous X-ray spectrum with accelerating potential 10000 V is  
 a)  $0.124 \text{ m}$                       b)  $12400 \times 10^{-10} \text{ m}$   
 c)  $0.124 \times 10^{-10} \text{ m}$                       d)  $12400 \text{ m}$
- 10) Which can not be exhibited for polarisation  
 a) X- rays                      b) Radio waves                      c) Sound waves                      d) Light waves

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**II. Answer any 3 questions.****3×2=6****(Qn No. 15 is compulsory)**

- 11) Fresnel diffraction - Fraunhofer diffraction - differ.
- 12) What is stopping potential?
- 13) What is matter waves?
- 14) Define - Cuire
- 15) Half lives of two radioactive elements A and B are 20 minutes and 40 minutes respectively. Initially, the samples have equal number of nuclei. Calculate the ratio of decayed numbers of A and B nuclei after 80 minutes.

**III. Answer any 3 questions.****3×3=9****(Qn No. 18 is compulsory)**

- 16) Discuss the alpha decay process with example
- 17) List out the Laws of photo electric emission.
- 18) A radiation of wavelength 300 nm is incident on a silver surface. Will photo electrons be observed? (Work function of silver is 4.7 eV)
- 19) List the uses of polonoids.
- 20) Discuss about Nicol prism.

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**IV. Answer all questions.****2×5=10**

- 21) Obtain the equation for bandwidth in young's double slit experiment.

**(OR)**

Describe briefly Davisson - German experiment which demonstrated the wave nature of electrons.

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

**(OR)**

Discuss the spectral series of hydrogen atom..

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