

**Model Question Paper**  
**Electromagnetic waves and wave options - Part II**

12th Standard

**Physics**

Reg.No. : 

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I. Answer all the Questions.  
II. Use blue pen only.

Time : 01:30:00 Hrs

Total Marks : 75

5 x 1 = 5

**Section-A**

- 1) A Beam of monochromatic light enters from vacuum into a medium of refractive index  $\mu$ . The ratio of the wavelengths of the incident and refracted waves is  
(a)  $\mu : 1$  (b)  $1 : \mu$  (c)  $\mu^2 : 1$  (d)  $\mu^2 : 1$
- 2) If the wavelength of the light is reduced to one fourth, then the amount of scattering is  
(a) increased by 16 times (b) decreased by 16 times (c) increased by 256 times (d) decreased by 256 times
- 3) In Newton's ring experiment the radii of the  $m^{\text{th}}$  and  $(m + 4)^{\text{th}}$  dark rings are respectively  $\sqrt{5}$  mm and  $\sqrt{7}$  mm. What is the value of  $m$ ?  
(a) 2 (b) 4 (c) 8 (d) 10
- 4) The path difference between two monochromatic light waves of wavelength  $4000 \text{ \AA}$  is  $2 \times 10^{-7}$  m. The phase difference between them is  
(a)  $\pi$  (b)  $2\pi$  (c)  $3\frac{\pi}{2}$  (d)  $\frac{\pi}{2}$
- 5) In Young's experiment, the third bright band for wavelength of light  $6000 \text{ \AA}$  coincides with the fourth bright band for another source in the same arrangement. The wavelength of the other source is  
(a)  $4500 \text{ \AA}$  (b)  $6000 \text{ \AA}$  (c)  $5000 \text{ \AA}$  (d)  $4000 \text{ \AA}$

**Section-B**

5 x 3 = 15

- 6) Give the condition for sustained interference.
- 7) Differentiate between polarised and unpolarised light.
- 8) Bring out the difference's between ordinary and extra ordinary light.
- 9) How are Stokes's and Anti-Stokes's lines formed?
- 10) What is meant by optical rotation? On what factors does it depend?

**Section-C**

5 x 5 = 25

- 11) Distinguish between interference and diffraction.
- 12) Write a note on pile of plates.
- 13) Explain the Hertz experiment.
- 14) Write a note on Fraunhofer lines.
- 15) State the uses of polaroids.

**Section-D**

3 x 10 = 30

- 16) Give the source and uses of electromagnetic waves.
- 17) Explain emission and absorption spectra.
- 18) a) What is Raman Effect? Explain Raman scattering of light with the help of energy level diagram.

(OR)

- b) Derive an expression for bandwidth of interference fringes in Young's double slit experiment.

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