

Time: Three Hours

Max. Marks: 100 Marks

PHYSICAL AND PRINCIPLES OF LIGHTING, GEOMETRIC OPTICS
SECTION A – PHYSICAL AND PRINCIPLES OF LIGHTING (50 MARKS)
(REVISED SCHEME – 4)

Q.P. CODE: 3344

Your answers should be specific to the questions asked
Draw neat, labeled diagrams wherever necessary

(Note : Both QP Codes 3344 and 3345 are to be answered within total duration of 3 hours)

LONG ESSAYS (First Question Choice)

1 x 10 = 10 Marks

1. What is simple harmonic motion? Obtain an expression for the total energy of a simple harmonically vibrating particle.

Or

What is diffraction of light? Obtain an expression for the intensity distribution in a single slit Fraunhofer diffraction pattern. Draw the intensity profile as a function of diffraction angle.

SHORT ESSAYS (Question No. 5 choice)

5 x 5 = 25 Marks

2. What are coherent waves? Explain how they are produced.
3. State Rayleigh's criteria for resolution of images. Explain why sky is blue in color.
4. Explain the construction and working of Nicol prism.
5. Explain the theory of interference of light using young's double slit experiment.

Or

Molybdenum has a work function of 4.20 eV. (i) Find the cut off wavelength and cutoff frequency for the photoelectric effect. (ii) What is the stopping potential if the incident light has a wavelength of 18 nm?

6. What is Raman effect? Briefly describe the appearance of stoke and Anti stoke lines.

SHORT ANSWER (Question No. 10 choice)

5 x 3 = 15 Marks

7. What is specific rotation? Explain the terms.
8. Write the applications of optical fibre.
9. Explain – i) Spontaneous emission and ii) Stimulated emission
10. What is Compton effect?

Or

A viewing screen is separated from a double slit source by 1.2 m. The distance the slits is 0.030 mm. The second order bright fringe is 4.5 cm from the centre line. Calculate i) The wavelength of the light and ii) The fringe width

11. Explain attenuations and distortions in an optical fiber in brief.