



Name :

Roll No. :

Invigilator's Signature :

CS/B.OPTM/SEM-2/BO-201/2012

2012

PHYSICAL OPTICS – II

Time Allotted : 3 Hours

Full Marks : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives from the following :

10 × 1 = 10

- i) The central fringe in case of Lloyd's mirror is
 - a) dark
 - b) bright
 - c) dark & bright
 - d) none of these.

- ii) In simple harmonic motion, during the motion
 - a) kinetic energy is conserved
 - b) potential energy is conserved
 - c) total energy is conserved
 - d) the amplitude is conserved.

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- iii) Which phenomena establish the wave nature of light ?
- a) Interference b) Polarization
- c) Diffraction d) All of these.
- iv) Which of the following wavefront diverging radically from a point source ?
- a) Parallel wavefront
- b) Convergent spherical wavefront
- c) Divergent spherical wavefront
- d) None of these.
- v) Diffraction was first observed by
- a) Fresnel b) Sir Isaac Newton
- c) Huygens d) Maxwell,
- vi) The basic difference between diffraction and interference is
- a) diffraction requires single slit while interference requires double
- b) interference requires single slit while diffraction requires double
- c) both of them requires single slit
- d) both of them requires double slit.



- vii) Grating sheet produces
- a) Irrational spectrum
 - b) Rational Spectrum
 - c) both (a) and (b)
 - d) none of these.
- viii) The properties of Coherent Sources are
- a) equal phase difference
 - b) equal or nearly equal Amplitude
 - c) the same wavelength
 - d) all of these.
- ix) The nature of light is
- a) Wave nature
 - b) Particle nature
 - c) Dual nature
 - d) All of these.
- x) In simple harmonic motion, the magnitude of the acceleration is
- a) constant
 - b) proportional to the displacement
 - c) inversely proportional to the displacement
 - d) greatest when the velocity is greatest.

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GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

2. Distinguish between Fresnel and Fraunhofer diffraction's.
3. Write short note on Lloyd's mirror.
4. Define diffraction of light and compare with interference of light.
5. Define resolving power and dispersive power of a grating.

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

6. State and explain Huygen's principle. With proper diagram obtain the spherical surface equation by wave theory.
7. Define retardation plate. Explain half-wave and quarter-wave retardation plate. State the application area of retardation plates. Compare between positive and negative crystal.
8. Deduce analytical treatment of interference of light. Prove that interference obeys the law of conservation of energy.
9. Explain the working principle of LASER. State different types of LASER and its application area.

