Final Term Tutorial

Chapter 33, 34, 35, 36, 37, 38, 39, 40

Optics & Modern Physics

Question 1:

A parallel beam of light in air makes an angle of 47.5^{O} with the surface of a glass plate having a refractive index of 1.52.

(a) What is the angle between the reflected part of the beam and the surface of the glass?
(b) What is the angle between the refracted beam and the surface of the glass?

Question 2:

A concave mirror forms an image, on a wall 3.00m in front of the mirror, of a headlamp filament 10.0cm in front of the mirror.

a) What are the radius of curvature and focal length of the mirror?
b) What is the lateral magnification? What is the image height if the object height is 5.00 mm.

Question 3:

Monochromatic light is at normal incidence on a plane transmission grating. The first-order maximum in the interference pattern is at an angle of 8.94^{O}. What is the angular position of the fourth-order maximum?

Question 4:

Coherent sources A and B emit electromagnetic waves with wavelength 2.00 cm. Point P is 4.86 m from A and 5.24 m from B. What is the phase difference at P between these two waves?

Question 5:

Define only following terminologies

(i) Total internal reflection
(ii) Nearsightedness
(iii) Farsightedness
(iv) Total internal reflection
(v) Refractive index
(vi) Angle of incidence
(vii) Angle of reflection
(viii) interference
(ix) Real image
(x) Virtual image
(xi) Lateral magnification