EXERCISE – I

CONCEPTUAL QUESTIONS

HUYGEN'S WAVE THEORY OF LIGHT

1. Which of the following phenomenon cannot be explained by the Huygen's Theory?
(1) Refraction (2) Reflection (3) Diffraction (4*) Polarization

2. Huygen's principle is applicable to
(1) Only light waves (2) Only sound waves
(3) Only mechanical waves (4*) For all the above waves

3. According to Huygen's Theory of secondary wavelets, following can be explained
(1) Propagation of light in medium (2) Reflection of light
(3) Refraction of light (4*) All of these

4. Huygen's Theory of secondary waves can be used to find
(1) Velocity of light (2) The wavelength of light
(3*) Wave front of microscope (4) Magnifying power of microscope

5. The main drawback of Huygen's Theory was
(1) Failure in explanation of rectilinear propagation of light
(2) Failure of explain the spectrum of white light
(3) Failure to explain the formation of Netwon's rings
(4*) A failure of experimental verification of ether medium

6. Light has a wave nature, because
(1) the light travel in a straight line
(2) light exhibits phenomenon of reflection and refraction
(3*) light exhibits phenomenon of interference
(4) light exhibits phenomenon of photo electric effect

7. Wave nature of light is verified by
(1*) Interference (2) Photo electric effect
(3) Reflection (4) Refraction

INTERFERENCE

8. The energy in the phenomenon of interference
(1*) is conserved, gets redistributed (2) is equal a every point
(3) is destroyed in regions of dark fringes (4) is created at the place of bright fringes

9. The resultant amplitude in interference with two coherent sources depends upon

(1) only amplitude
(2) only phase difference
(3*) on both the above
(4) none of the above

10. Which of following nature of light waves is supported by the phenomenon of interference?
(1) longitudinal
(2) transverse
(3) both transverse and longitudinal
(4*) None of the above

11. For distinct interference pattern to be observed, necessary condition is that ratio of intensity of light emission by both sources should be
(1) 2 : 1
(2) 1 : 2
(3*) 1 : 1
(4) 1 : 4

12. The phase difference corresponding to path difference of x is
(1*) $\frac{2\pi x}{\lambda}$
(2) $\frac{2\pi\lambda}{x}$
(3) $\frac{\pi x}{\lambda}$
(4) $\frac{\pi\lambda}{x}$

13. The coherent source of light produces constructive interference when phase difference between them is
(1) π
(2) $\frac{1}{2}\pi$
(3) $\frac{3}{2}\pi$
(4*) 2π

14. Phenomenon of interference is not observe dby two sodium lamps of same power. It is because both waves have
(1*) not constant phase difference
(2) zero phase difference
(3) different intensity
(4) different frequencies

15. Coherent sources can be obtained
(1) only by division of wave front
(2) only by division of amplitude
(3*) both by division of amplitude and wave front
(4) none of the above

16. In an interference of light derived from two slit aperatures, if at some point on the screen, yellow light has a path difference of $\frac{3\lambda}{2}$ then the fringe at that point will be
(1) yellow in color
(2) white in colour
(3*) dark
(4) bright

17. Two beams of light having intensities I and 4I interfere to produce a fringe pattern on a screen. The phase difference between the beam is $\frac{\pi}{2}$ at point A and 2π at point B. Then find out the difference between the resultant intensities at A and B
(1) 2I
(2) 5I
(3) I
(4*) 4I

18. Amplitude of waves observed by two light sources of same wave length are a and 2a and have a phase difference of π between them. Then minimum intensity of light will be proportional to

(1) 0 (2) $5a^2$ (3*) a^2 (4) $9a^2$

19. If the intensity of the waves observed by two coherent sources is I. Then the intensity of resultant wave in constructive interference will be

(1) 2I (2*) 4I (3) I (4) None of the above

20. If intensity of each of the two waves is I and they are having phase difference of 120°,w hen the waves are superimposed, then the resultant intensity will be

(1*) I (2) 2I (3) $\frac{I}{2}$ (4) 4I

21. Ratio of intensity of two waves is 25 : 1. If interference occurs, then ratio of maximum and minimum intensity should be

(1) 25 : 1 (2) 5 : 1 (3*) 9 : 4 (4) 4 : 9

22. The intensity of two waves is 2 and 3 unit, then average intensity of light in the overlapping region will have the value

(1) 2.5 (2) 6 (3*) 5 (4) 13

23. The light waves from two independent monochromatic light sources are given by $y_1 = 2\sin(\omega t - kx)$ and $y_2 = 3\sin(\omega t - kx)$, then the following statement is correct

(1) Both the waves are coherent

(2*) Both the waves are incoherent

(3) Both the waves have different time periods

(4) None of the above

24. The phenomenon of interference is shown by

(1) Longitudinal mechanical waves only (2) Transverse mechanical waves only

(3) Electromagnetic waves only (4*) All the above type of waves

25. For the sustained interference of light, the necessary condition is that the two sources should

(1*) have constant phase difference (2) be narrow

(3) be close to each other (4) of same amplitude

26. If ratio of amplitude of two interfering source is 3 : 5. Then ratio of intensity of maxima and minima in interference pattern will be

(1) 25 : 16 (2) 5 : 3 (3*) 16 : 1 (4) 25 : 9

27. Two coherent light beams of intensity I and 4I are superposed. The maximum and minimum possible intensities in the resulting beam are

(1) 5 I and 3I (2) 5I and I (3) 9I and 3I (4*) 9I and I

28. Two coherent sources of intensities I_1 and I_2 produce and interference pattern. The maximum intensity in the interference pattern will be

(1) $I_1 + I_2$ (2) $I_1^2 + I_2^2$ (3) $(I_1 + I_2)^2$ (4*) $(\sqrt{I_1} + \sqrt{I_2})^2$

29. Two wave are represented by the equations, $y_1 = a \sin \omega t$ and $y_2 = a \cos \omega t$. The first wave

(1) leads the second by π (2) lags the second by π

(3) leads the second by $\frac{\pi}{2}$ (4*) lags the second by $\frac{\pi}{2}$

30. the resultant amplitude of a vibrating particle by the superposition of the two waves $y_1 = a \sin\left(\omega t + \frac{\pi}{3}\right)$ and $y_2 = a \sin \omega t$ is

(1) a (2) $\sqrt{2}$ a (3) 2a (4*) $\sqrt{3}$ a

31. Two coherent sources of different intensities send waves which interfere. If the ratio of maximum and minimum intensity in the interference pattern is 25 then find ratio of intensities of sources

(1) 25 : 1 (2) 5 : 1 (3*) 9 : 4 (4) 25 : 16

32. What is the path difference of destructive interference?

(1) $n\lambda$ (2) $n(\lambda + 1)$ (3) $\frac{(n+1)\lambda}{2}$ (4*) $\frac{(2n+1)\lambda}{2}$

33. If an interference pattern have maximum and minimum intensities in 36 : 1 ratio then what will be the ratio of amplitudes

(1) 5 : 7 (2) 7 : 4 (3) 4 : 7 (4*) 7 : 5

34. When a thin transparent plate of thickness t and refractive index μ is placed in the path of one of the two interfering waves of light, then the path difference changes by

(1) $(\mu + 1)t$ (2*) $(\mu - 1)t$ (3) $\frac{(\mu+1)}{t}$ (4) $\frac{(\mu-1)}{t}$

35. Due to effect of interference, floating oil layer in water is visible coloured, due to observation of this event the thickness of oil layer should be

(1) 10 nm (2*) 0.1 μm (3) 1 mm (4) 10 mm

36. If intensity ratio of two interfering waves in 9 : 1 then ratio of maximum to minimum amplitude of resultant wave is

(1*) 2 : 1 (2) 3 : 2 (3) 1 : 3 (4) 5 : 2

37. For coherent sources which is essential

(1) color same (2*) ϕ constant (3) v different (4) Amplitude same

38. When exposed to sunlight, thin films of oil on water often exhibit brilliant colors due to the phenomenon of

(1*) interference (2) diffraction (3) dispersion (4) polarisation

39. If $\frac{I_1}{I_2} = \frac{9}{1}$, then $\frac{I_{max}}{I_{min}} = ?$

(1) 100 : 64 (2) 64 : 100 (3*) 4 : 1 (4)1 : 4

40. Soap bubble appears coloured due to the phenomenon of

(1) Total internal reflection (2*) Interference by division of amplitude

(3) Interference by division of wave front (4) Diffraction of light

41. Two coherent light sources emit light of the

(1) same intensity

(2) different frequency

(3) constant phase difference but different wavelengths

(4*) same frequency have constant phase difference

YDSE

42. In Young's experiment, if the amplitude of interfering waves are unequal then the

(1*) contrast in the fringes decreases (2) contrast in the fringes increase

(3) number of fringes will increase (4) number of fringes will decrease

43. Young's experiment proves that which of the following fact

(1) light is made up of particles

(2*) light is made up of waves

(3) light is made up of neither waves nor particles

(4) fringe width doesn't depend upon the spacing

44. Which of the following statement is true in Young's experiment, separation between the slits is gradually increased ?

(1) fringe with increases and fringes disappear

(2*) fringe width decrease and fringes disappear

(3) fringes become blurred

(4) fringe width remains constant and fringes are more bright

45. In Young's double slit experiment

(1) only interference occurs (2) only diffraction occurs

(3*) both interference and diffraction occurs (4) none of the above

46. In Young's double slit experiment, one of the slits is so painted that intensity of light emitted from it is half of that of the light emitted from other slit. Then

(1) fringe system will disappear

(2) bright fringes will become brighter and dark fringes will be darker

(3) both bright and dark fringes will become darker

(4*) dark fringe will become less dark and bright fringes will become less bright

47. In white light interference, nearest to the central (bright) fringe, will have which of the following colour

(1) violet (2) yellow (3*) red (4) green

48. In Young's double slit experiment, wavelength of light is 6000 Å. Then the phase difference between the light waves reaching the third bright fringe from the central fringe will be

(1) zero (2) 2π (3) 4π (4*) 6π

49. If intensity of each wave in the observed interference patter in Young's double slit experiment is I_0, then for some point P where the phase difference is ϕ, intensity I will be

(1) $I = I_0 \cos \phi$ (2) $I = I_0 \cos^2 \phi$ (3) $I = I_0 (1 + \cos \phi)$ (4*) $I = 2I_0 (1 + \cos \phi)$

50. In Young's double slit experiment, bright fringes are of

(1) equal widths and unequal intensities (2) unequal widths and equal intensities

(3*) equal widths and equal intensities (4) unequal widths and unequal intensities

51. In Young's experiment, monochromatic light through a single slit S is used to illuminate the two slits S_1 and S_2. Interference fringes are obtained on a screen. The fringe with is found to be w. Now a thin sheet of mica (thickness t and refractive index μ) is placed near and in front of one of the two slits. Now the fringe width is found to be w', then

(1) $w' = \frac{w}{\mu}$ (2) $w' = w\mu$ (3) $w' = (\mu - 1)tw$ (4*) $w' = w$

52. In Young's double slit experiment, the two slits act as coherent sources of equal amplitude A and wavelength λ. In another experiment with the same set up the two slits are sources of equal amplitude A and wavelength λ but are incoherent. The ratio of the intensity of light at the mid-point of the screen in the first case to that in the second case is

(1) 4 : 1 (2*) 2 : 1 (3) 1 : 1 (4) None of the above

53. In Young's double slit experiment, if the width of the slits are in the ratio 4 : 9 the ratio of the intensity of maxima to the intensity at minima will be

(1) 169 : 25 (2) 81 : 16 (3*) 25 : 1 (4) 9 : 4

54. In an interference experiment, the spacing between successive maxima or minima is

(1) $\frac{\lambda d}{D}$ (2*) $\frac{\lambda D}{d}$ (3) $\frac{dD}{\lambda}$ (4) $\frac{\lambda d}{4D}$

55. Young's experiment is performed in air and then performed in water, the fringe width

(1) will remain same (2*) will decrease (3) will increase (4) will be infinite

56. In Young's experiment, one slit is covered with a blue filter and the other with a yellow filter. Then the interference pattern

(1) will be blue (2) will be yellow (3) will be green (4*) will not be formed

57. In Young's double slit experiment, a mica sheet of thickness t and refractive index μ is introduced in the path of ray from the first source S_1. By how much distance the fringe pattern will be displaced

(1) $\frac{d}{D}(\mu-1)t$ (2*) $\frac{D}{d}(\mu-1)t$ (3) $\frac{d}{(\mu-1)D}$ (4) $\frac{D}{d}(\mu-1)$

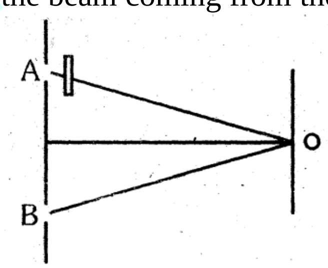
58. In Young's experiment, light of wavelength 6000 Å is used to produce fringes of width 0.8 mm at a distance of 2.5 m. If the whole experiment is deep in a liquid of refractive index 1.6, then fringe width will be

(1*) 0.5 mm (2) 0.6 mm (3) 0.4 mm (4) 0.2 mm

59. If a transparent medium of refractive index μ = 1.5 and thickness t = 2.5×10^{-5} m inserted in front of the slits of Young's Double slit experiment, how much will be the shift in the interference pattern? The distance between the slits is 0.5 mm and that between slits and screen is 100 cm

(1) 5 cm (2*) 2.5 cm (3) 0.25 cm (4) 0.1 cm

60. In Young's experiment, monochromatic light is used to illuminate the two slits A and B. Interference fringes are observed on a screen placed in front of. the slits. Now if a thin glass plate is placed normally in the path of the beam coming from the slit then :

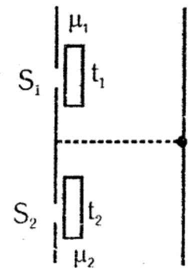


(1) The fringes will disappear (2) The fringe width will decrease
(3) The fringe width will increase (4*) There will be no change in the fringe width

61. The central fringe of interference pattern produced by light of wavelength 6000Å is found to shift to the position of 4th bright fringe, after a glass plate of μ = 1.5 is introduced. The thickness of the glass plate is:

(1*) 4.8 μm (2) 8.23 μm (3) 14.98 μm (4) 3.78 μm

62. In a Young's double slit experiment, a slab of thickness 1.2 μm and refractive index 1.5 is placed in front of one slit and another slab of thickness t and refractive index 2.5 is placed in front of the second slit. If the position of the central fringe remains unaltered, then the thickness t is



(1*) 0.4 μm (2) 0.8 μm (3) 1.2 μm (4) 7 μm

63. In Y.D.S.E. the fringe width is 0.2 mm. If wavelength of light is increase by 10% and separation between the slits in increased by 10% then fringe width will be
(1*) 0.20 mm (2) 0.165 mm (3) 0.401 mm (4) 0.242 mm

64. A very thin transparent film of soap solution (thickness $\rightarrow$ 0) is seen under reflection of white light. Then the color of the film appear to be
(1) blue (2*) black (3) red (4) yellow

65. In Young's double slit experiment, if monochromatic light is replaced by white light
(1) All bright fringes becomes white
(2) All bright fringes have coloures between violet and red
(3*) Only the central fringe is white, all other fringes are coloured
(4) No fringes are observed

66. The fringe width in Young's double slit experiment increases when
(1*) wavelength increase
(2) distance between the slits increases
(3) distance between the source and screen decreases
(4) frequency of incident light increases

67. Young's double slit experiment is performed with light of wavelength 550 nm. The separation between the slits is 1.10 mm and screen is placed at distance of 1 m. What is the distance between the consecutive bright or dark fringes
(1) 1.5 mm (2) 1.0 mm (3*) 0.5 mm (4) None of these

68. In the Young's double slit experiment, for which colour the fringe width is least?
(1) Red (2) Green (3*) Blue (4) Yellow

69. If the sodium light in Young's double slit experiment is replaced by red light, the fringe width will:
(1) Decrease (2*) Increase
(3) Remain unaffected (4) First increase, then decrease

70. A double slit experiment is performed with light of wavelength 500 nm. A thin film of thickness 2 μm and refractive index 1.5 is introduced in the path of the. upper beam. The location of the central maximum will :

(1) Remain unshifted
(2) Shift downward by nearly two fringes
(3*) Shift upward by nearly two fringes
(4) Shift downward by 10 fringes

71. In YDSE experiment, when two light waves make third minima, then they have

(1) Phase difference of 3π
(2) Phase difference of $\frac{5\pi}{2}$
(3) Path difference of 3λ
(4*) Path difference of $\frac{5\lambda}{2}$

72. If in a Young's double slit experiment, width between the slits is 3 cm, the separation between slits and screen in 7 cm and wavelength of light is 1000 Å, then fringe width will be

(1) 2×10^{-5} m
(2) 2×10^{-9} m
(3) 0.2×10^{-6} m
(4*) 2.3×10^{-7} m

73. A monochromatic beam of light is used for the formation of fringes on the screen by illuminating the two slits in the Young's double slit interference experiment. When a thin film of mica is interposed in the path of one of the interfering beams then

(1) The fringe width increases
(2) The fringe width decrease
(3*) The fringe width remains the same but the pattern shifts
(4) The fringe pattern disappears

74. In an interference experiment, third bright fringe is obtained at a point on the screen with a light of 700 nm. What should be the wavelength of the light in order to obtain 5th bright fringe at the same point?

(1) 500 nm
(2) 630 nm
(3) 750 nm
(4*) 420 nm

75. In a double slit experiment if light of wavelength 5000 Å is used then fringe width of 1 mm is obtained. If now light of wavelength 6000 A is used without altering the system then new fringe width will be :

(1) 1 mm
(2) 0.5 mm
(3*) 1.2 mm
(4) 1.5 mm

76. Monochromatic green light has wavelength 5×10^{-7} m. The separation between slits is 1 mm. The fringe width of interference pattern obtained on screen at a distance of 2 meter is :

(1*) 1 mm
(2) 0.5 mm
(3) 2 mm
(4) 0.1 mm

77. In Young's double slit experiment when wavelength of 700 nm is used then fringe width of 0.07 mm is obtained. If wavelength of 500 nm is used then what is the fringe width ?

(1) 0.35 mm
(2*) 0.5 mm
(3) 3.5 mm
(4) 5 mm

78. What will be the effect on fringe width, with distance between slits become doubled?

(1*) $\frac{1}{2}$ times
(2) 2 times
(3) $\frac{1}{4}$ times
(4) Unchanged

DIFFRACTION

79. The conversation going on, in some room, can be heared by the person outside the room. The reason for it is
(1) Interference of sound (2) Reflection of sound
(3*) Diffraction of sound (4) Refraction of sound

80. Phenomenon of diffraction occurs
(1) only in case of light and sound waves
(2*) for all kinds of waves
(3) for electro-magnetic waves and not for matter waves
(4) for light waves but not is case of X rays

81. Which of the following ray gives more distinct diffraction?
(1) X-ray (2) light ray (3) γ-ray (4*) Radio wave

82. All fringes of diffraction are of
(1) the same intensity (2*) unequal width
(3) the same width (4) full darkness

83. What happens, when the width of the slit aperture is increased in an experiment of single slit diffraction experiment?
(1) spread of diffraction region is increased
(2) spread of diffraction region is decreased
(3*) spread of diffraction region will be decreased and mid-band becomes narrow
(4) none of the above

84. Light waves do not travels strictly in straight line, can be best explained by
(1) Particle nature of light (2*) Diffraction
(3) Interference (4) Polarisation

85. In the diffraction pattern of a single slit aperture, the width of the central fringe compared to widths of the other fringes, is
(1) equal (2) less (3) little more (4*) double

86. Diffracted fringes obtained from the slit aperture are of
(1) same width (2) different width
(3) uniform intensity (4*) non-uniform width and non-uniform intensity

87. Central fringe obtained in diffraction pattern due to a single slit
(1) is of minimum intensity
(2*) is of maximum intensity
(3) intensity does not depend upon slit width
(4) none of the above

88. In a single slit diffraction pattern if the light source is used of less wave length then previous one. The width of the central fringe will be
(1*) less (2) increase (3) unchanged (4) none of the above

89. In the laboratory, diffraction of light by a single slit is being observed. If slit is made slightly narrow, then diffraction pattern will

(1*) be more spreaded than before (2) be less spreaded than before
(3) be spresded as before (4) be disappeared

90. For Fraunhofer single slit diffraction
(1) width of central maxima is proportional to λ
(2) on increasing the slit width, the width of central maxima decrease
(3) on making the slit with $a = \lambda$, central fringe spreads in the range $\pm 90°$
(4*) all of the above are correct

91. In a Fraunhofer's diffraction by a slit, if slit width is a, wave length λ, focal length of lens is f, linear width of central maxima is

(1) $\frac{f\lambda}{a}$ (2) $\frac{fa}{\lambda}$ (3*) $\frac{2f\lambda}{a}$ (4) $\frac{f\lambda}{2a}$

92. In a Fraunhofer's diffraction obtained by a single slit aperture, the value of path difference for nth order of minima is

(1*) $n\lambda$ (2) $2n\lambda$ (3) $(2n-1)\lambda/2$ (4) $(2n-1)\lambda$

93. A light source of 5000 Å wave length produces a single slit diffraction. The first minima in diffraction pattern is seen, at a distance of 5 mm from central maxima. The distance between, screen and slit is 2 metre. The width of slit in mm will be

(1) 0.1 (2) 0.4 (3*) 0.2 (4) 2

94. A plane wave front of wave length 6000 Å is incident upon a slit of 0.2 mm width, which enables Fraunhofer's diffraction pattern to be obtained on a screen 2 metre away. Width of the central maxima in mm will be

(1) 10 (2*) 12 (3) 8 (4) 2

95. The waves of 600 μm wave length are incident normally on a slit of 1.2mm width. The value of diffraction angle corresponding to the first minima will be (in radian) :

(1) $\frac{\pi}{2}$ (2*) $\frac{\pi}{6}$ (3) $\frac{\pi}{3}$ (4) $\frac{\pi}{4}$

96. In Fraunhoffer diffraction the centre of diffraction image is
(1*) always bright
(2) always dark
(3) sometimes bright and sometimes dark
(4) bright for large wavelength and dark for low wavelength

97. A single slit of width d is placed in the path of beam of wavelength λ. The angular width of the principal maximum obtained is :

(1) $\frac{d}{\lambda}$ (2) $\frac{\lambda}{d}$ (3*) $\frac{2\lambda}{d}$ (4) $\frac{2d}{\lambda}$

98. Bending of light waves at the sharp edges of an opaque obstacle is known as
(1) refraction (2) reflection (3*) diffraction (4) interference

99. Diffraction and interference of light refers to
(1) quantum nature of light (2*) wave nature of light
(3) transverse nature of light (4) electromagnetic nature o light

100. The phenomenon of diffraction of light was discovered by
(1) Huygens (2) Newton (3) Freshnel (4*) Grimaldi

101. Angular width (θ) of central maximum of a diffraction pattern of a single slit does not depend upon
(1*) distance between slit and source (2) wavelength of light used
(3) width of the slit (4) frequency of light used

102. Red light is generally used to observe diffraction pattern from single slit. If green light is used instead of red light, then diffraction pattern
(1) will be more clear (2*) will be contract
(3) will be expanded (4) will be visualize

103. Diffraction of sound waves in more evident than light waves in daily life because
(1*) $\lambda_{sound} > \lambda_{light}$ (2) $\lambda_{sound} = \lambda_{light}$
(3) $\lambda_{sound} < \lambda_{light}$ (4) sound waves are longitudinal but light waves

104. In single slit Fraunhoffer diffraction which type of wave front is required
(1) cylindrical (2) spherical (3) elliptical (4*) plane

105. If in Fraunhofer diffraction due to a single slit, the slit width is increased, then the width of the central maximum will
(1) increase (2*) decrease
(3) not change (4) change depends on the wavelength of light used

POLARISATION, BRWSTER LAW AND MALUS LAW

106. A polariser is used to
(1) Reduce intensity of light (2*) Produce polarized light
(3) Increase intensity of light (4) Produce unpolarised light

107. Light waves can be polarized as they are
(1*) Transverse (2) Of high frequency (3) Longitudinal (4) Reflected

108. Through which character we can distinguish the light waves from sound waves
(1) Interference (2) Refraction (3*) Polarisation (4) Reflection

109. Which of the following cannot be polarized?
(1) Radio waves (2) Ultraviolet rays (3) Infrared ray (4*) Ultrasonic waves

110. The transverse nature of light is shown by
(1) Interference of light
(2) Refraction of light
(3*) Polaristion of light
(4) Dispersion of light

111. the angle of polarization for any medium is 60°, what will be critical angle for this
(1) $\sin^{-1}\sqrt{3}$
(2) $\tan^{-1}\sqrt{3}$
(3) $\cos^{-1}\sqrt{3}$
(4*) $\sin^{-1}\frac{1}{\sqrt{3}}$

112. The angle of incidence at which reflected light is totally polarized for reflection from air to glass (refractive index n)
(1) $\sin^{-1} n$
(2) $\sin^{-1}\left(\frac{1}{n}\right)$
(3) $\tan^{-1}\left(\frac{1}{n}\right)$
(4*) $\tan^{-1}(n)$

113. A ray of light is incident on the surface of a glass plate at an angle of incidence equal to Brewster's angle ϕ. If μ represents the refractive index of glass with respect to air, then the angle between reflected and refracted rays is :
(1) $90 + \phi$
(2) $\sin^{-1}(\mu \cos \phi)$
(3*) 90°
(4) $90° - \sin^{-1}(\sin \phi/\mu)$

114. Refractive index of material is equal to tangent of polarizing angle. It is called.
(1*) Brewster's law
(2) Lambert's law
(3) Malus's law
(4) Bragg's law

115. When unpolarized light beam is incident from air onto glass (n = 1.5) at the polarizing angle :
(1*) Reflected beam is 100 percent polarized
(2) Reflected and refracted beams are partially polarized
(3) The reflected and refracted ray will not perpendicular to each other
(4) All of the above

116. When the angle of incidence on a material is 60°, the reflected light is completely polarized. The velocity of the refracted ray inside the material is (in ms^{-1}) :
(1) 3×10^8
(2) $\left(\frac{3}{\sqrt{2}}\right)\times 10^8$
(3*) $\sqrt{3}\times 10^8$
(4) 0.5×10^8

117. A polaroid is placed at 45° to an incoming light of intensity I_0. Now the intensity of light passing through polaroid after polarisation would be:
(1) I_0
(2*) $\frac{I_0}{2}$
(3) $\frac{I_0}{4}$
(4) zero

118. Plane polarized light is passed through a Polaroid. On viewing through the polariod we find that when the polarioid is given one complete rotation about the direction of the light, one of the following is observed
(1) The intensity of light gradually decreases to zero and remains at zero
(2) The intensity of light gradually increases to a maximum and remains at maximum
(3) There is no change in intensity
(4*) The intensity of light is twice maximum and twice zero

119. Polarised glass is used in sun glasses because :
(1*) It reduces the light intensity to half an account of polarisation
(2) It is fashionable
(3) It is good colour
(4) It is cheaper

120. When a plane polarized light is passed through an analyser and analyser is rotated from 0 to 90°, the intensity of the emerging light
(1) Varies between a maximum and minimum
(2) Becomes zero
(3) Does not vary
(4*) Varies between a maximum and zero

121. When an unpolarized light of intensity I_0 is incident on a polarizing sheet, the intensity of the light which does not get transmitted is :
(1) Zero (2) I_0 (3*) $\frac{1}{2}I_0$ (4) $\frac{1}{4}I_0$

EXERCISE-I (Conceptual Questions) ANSWER KEY

Que.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Ans.	4	4	4	3	4	3	1	1	3	4	3	1	4	1	3
Que.	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Ans.	3	4	3	2	1	3	3	2	4	1	3	4	4	4	4
Que.	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
Ans.	3	4	4	2	2	1	2	1	3	2	4	1	2	2	3
Que.	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Ans.	4	3	4	4	3	4	2	3	2	2	4	2	1	2	4
Que.	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
Ans.	1	1	1	2	3	1	3	3	2	3	4	4	3	4	3
Que.	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90
Ans.	1	2	1	3	2	4	2	3	2	4	4	2	1	1	4
Que.	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105
Ans.	3	1	3	2	2	1	3	3	2	4	1	2	1	4	2
Que.	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
Ans.	2	1	3	4	3	4	4	3	1	1	3	2	4	1	4
Que.	121														
Ans.	3														