Ravi Maths Tuition Centre

Time : 1 Mins **WAVE OPTICS 1** **Marks : 695**

1. A concave lens is used to form an image of a real object.The maximum distance of the image from the optical centre is:
   a) 4f b) 2f c) f d) infinite
2. From a single slit, the first diffraction minima is obtained at 30° for a light of 6500 $\overset{o}{A}$ wavelength. The width of the slit is
   a) 3250 $\overset{o}{A}$ b) 1.3 μ c) 5.4 x 10^{-4} km d) 1.2 x 10^{-2} cm .
3. The reason of interference is
   a) phase difference b) change of amplitude c) change of velocity d) intensity
4. Unit of angular dispersion is
   a) Radian b) Radian / metre c) No unit d) None
5. Consider the diffraction pattern for a small pinhole. As the size of the hole is increased
   a) The size decrease b) The intensity increase c) The size increase
   d) The intensity decrease
6. Light of wavelength $6000\ \overset{\circ}{A}$ falls on a plane reflecting surface. The reflected wavelength is
   a) $6000\ \overset{\circ}{A}$ b) $< 6000\ \overset{\circ}{A}$ c) $> 6000\ \overset{\circ}{A}$ d) cannot say
7. The angle between pass axis of polarizer and analyzer is 45°. The percentage of polarized light passing through analyzer is
   a) 100% b) 50% c) 25% d) 75%
8. In all optical instruments, we use
   a) ray optics b) wave optics c) physical optics d) none of these
9. Which of the following can be used to control the intensity, in sunglasses, window panes etc?
   a) Transverse wave b) Polaroids c) Plane polarised wave d) Polarised wave
10. A real image of half the size is obtained in a concave spherical mirror with a radius of curvature of 40cm. The distance of object and its image will be
    a) 30cm and 60cm b) 60cm and 30cm c) 15cm and 30cm d) 30cm and 15cm
11. In order to increase the magnifying power of a microscope

a) The focal powers of the objective and the eye piece should be large

b)

Objective should have small focal length and the eyepiece should have large focal lenght.

c) Both should have large focal lengths

d)

The objective should have large focal length and eyepiece should have small focal length

12. For a biconvex lens, an image lies at same distance as the obect is from lens; image is real and inverted.What can be said about the object

    a) placed at focus b) placed between f & 2f c) placed at 2f d) placed beyond 2f

13. The linear magnification of a convex mirror is

    a) always positive b) always negative

    c) sometimes positive and sometimes negative d) cannot predict

14. The wavefront due to a source situated at infinity is

    a) spherical b) cylindrical c) planar d) circular

15. In Young's double slit experiment, distance between slits in kept 1mm and a screen is kept 1m apart from slits. If wavelength of light used is 500 nm, then fringe spacing is

    a) 0.5 mm b) 0.5 cm c) 0.25 mm d) 0.25 cm

16. A ray of light falls on a transparent slab of $\mu = 1.0$. If reflected and refracted rays are mutually perpendicular, what is the angle of incidence?

    a) 45° b) 60° c) 30° d) 90°

17. The lens used for correcting myopia is

    a) concave b) convex c) Plano concave d) none of these

18. Total internal reflection takes place when light is incident

    a) on a concave mirror b) from air on a plan glass surface at a certain given angle

    c) from air on a plan surface at any angle

    d) from inside glass placed in water at a certain given angle

19. The final image in an astronomical telescope (w.r.t. object) is

    a) virtual and erect b) real and erect c) real and inverted d) virtual and inverted

20. A pencil of light rays falls on a plane mirror and form a real image, so the incident rays are

    a) parallel b) diverging c) converging d) statement is false

21. The refractive indices of glass and water with respect to air 3/2 and 4/3 respectively.What is the refractive index of glass w.r.t water?

    a) 1/2 b) 9/8 c) 8/9 d) None

22. Two light waves superimposing at the mid-point of the screen are coming from coherent sources of light with phase difference π rad. Their amplitudes are 2 cm each. The resultant, amplitude at the given point will be
    a) 8 cm b) 2 cm c) 4 cm d) Zero
23. Sound waves are not electromagnetic waves as
    a) they cannot undergo interference b) they cannot undergo diffraction
    c) they cannot be polarized d) they cannot pass through vacuum
24. A source of light lies on the angle bisector of two plane mirror included at angle . The value of θ so that the light reflected from one mirror does not reach the other mirror does not reach each other mirror will be
    a) $\theta \geq 120^{\circ}$ b) $\theta \geq 90^{\circ}$ c) $\theta \geq 90^{\circ}$ d) None of the above
25. The final image formed by a terrestrial telescope is
    a) erect b) inverted c) sometimes erect and sometimes inverted
    d) none of the above
26. Which is not true for the image formed in a plane mirror? The image is
    a) virtual b) erect c) laterally inverted d) closer to the mirror than the object
27. Consider the sunlight incident on a pinhole of width.$10^3 A$ The image of a pinhole seen on a screen shall be
    a) A sharp white ring b) Different from geometrical image
    c) A diffused central spot, white in colour
    d) diffused coloured region around a sharp central white spot
28. Ray diverging from a point source on a wavefront are
    a) cylindrical b) spherical c) plane d) cubical
29. The phase difference between the two light waves reaching at a point P is 100 π. Their path difference is equal to
    a) 10 λ b) 25 λ c) 50 λ d) 100 λ
30. The speed of light is
    a) less in denser medium b) more in denser medium
    c) independent of the optical density of the medium d) none of the above
31. In the propagation of light waves, the angle between the direction of vibration and plane of polarisation is
    a) 0^o b) 90^o c) 45^o d) 80^o
32. In Young's double-slit experiment, the intensity at the central maximum is 10 if one of the slit is covered, then the intensity at the central maximum become:
    a) $\frac{I_0}{2}$ b) $\frac{I_0}{\sqrt{2}}$ c) $\frac{I_0}{4}$ d) I_0
33. Resolving power of microscope depends upon
    a) wavelength of light used (directly proportional)
    b) wavelength of light used (inversely proportional c) frequency of light used

d) focal length of objective

34. Which of the following is a correct representation of deviation and dispersion of light by a prism

a)  b) c) d)

35. The phenomenon of interference is based on
    a) conservation of momentum b) conservation of energy.
    c) conservation of momentum and energy d) quantum nature of light
36. What happens, if the monochromatic light used in Young's double slit experiment is replaced by white light?
    a) No fringes are observed b) All bright fringes become while
    c) All bright fringes have colour between violet and red
    d) Only the central fringe is white and all other fringes are coloured.
37. As an object gets closer to the focal point of a converging lens from infinity, its image
    a) Becomes smaller b) Remains of the same size c) Gets farther the lens
    d) Get closer to the lens
38. In the above question, the relation remains the same whether
    a) image is real or virtual b) refracting surface is convex or concave
    c) light is going from rarer to denser medium or from denser to rarer medium
    d)
    object is close to or far off from the refracting surface choose the wrong statement
39. A small link dot on a paper is seen through a glass slab of thickness 4 cm and refractive index 1.5. The dot appears to be raised by
    a) 1 cm b) 2 cm c) 3 cm d) 1.33 cm
40. Two distinct light bulbs as sources
    a) can produce an interference pattern
    b) cannot produce a sustained interference pattern
    c) can produce an interference pattern, if they produce light of same frequency
    d)
    can produce an interference pattern onlywhen the light produced by them is monochromatic in nature
41. The relation governing refraction of light from rarer to denser medium at a spherical refracting surface is
    a) $-\frac{\mu_1}{u}+\frac{\mu_2}{v}=\frac{\mu_2-\mu_1}{R}$ b) $\frac{\mu_1}{u}+\frac{\mu_2}{v}=\frac{\mu_2-\mu_1}{R}$ c) $\frac{\mu_1}{u}-\frac{\mu_2}{v}=\frac{\mu_2-\mu_1}{R}$ d) none of these
42. In a young's double slit experiment, the source is white light. One of the holes is covered by a red filter and another by a blue filter. In this case
    a) There shall be alternate interference pattern of red and blue
    b) There shall be alternate interference pattern of red distinct from that for blue

c) There shall be no interference fringes

d) There shall be alternate interference pattern of red mixing with one for blue

43. When light travels from an optically rarer medium to an optically denser medium, the velocity decreases because of change in

a) wave length b) frequency c) amplitude d) phase

44. The relation between focal length f and radius of curvature R of a spherical mirror is

a) $f = R$ b) $f = R/2$ c) $f = 2R$ d) none of these

45. The formation of rainbow is a natural example of

a) Interference b) Dispersion c) Diffraction d) Reflection

46. A beaker containing a liquid appears to be half full when it is actually one third full.The refractive index of liquid is

a) 7/6 b) 6/5 c) 3/2 d) 5/4

47. Which one of the following phenomena is not explained by Huygens' construction of wavefront?

a) Refraction b) Reflection c) Diffraction d) Origin of spectra

48. A bi convex lens can form a virtual image if the object is placed

a) between f and lens b) between f and 2f c) beyond 2f d) at infinity

49. If m_0 and m_e are the magnifications produced by an objective lens and eye lens of a microscope, the magnifying power of the telescope is

a) $m_0 - m_e$ b) $m_0 + m_e$ c) $m_0 \times m_e$ d) m_0 / m_e

50. For a telescope, larger the diameter of the objective lens

a) greater is the resolving power b) smaller is the resolving power

c) greater is the magnifying power d) smaller is the magnifying power

51. The velocity of light in glass whose refractive index (μ_g) is 1.5 is 2×10^8 m/s.In certain liquid, the velocity of light is found to be 2.6×10^8m/s.The refractive index (μ_ω) of that liquid is

a) 1.5 b) 1.2 c) 1 d) 2.1

52. A prism has a refracting angle of 60^0.When a ray is incident at 50^0, it suffers minimum deviation (δ_m) is

a) 45^0 b) 60^0 c) 55^0 d) 40^0

53. What is the focal length of the a bi convex lens of radius curvature 40cm.($\mu = 1.5$)

a) 50cm b) 40cm c) -30cm d) -40cm

54. The magnifying power of a telescope can be increased by using

a) objective of large focal length b) objective of small focal length

c) eye lens of small focal length d) all of the above

55. When unpolarised light beam is incident from air onto glass (n = 1.5) at the polarising angle.

a) Reflected beam is polarised completely
b) Reflected and refracted beams are partially polarised
c) Refracted beam is plane polarised d) Whole beam of light is refracted

56. The image of a distant object as seen through an astronomical telescope is
a) Erect b) Inverted c) Perverted d) None of these

57. Huygens' principle of secondary wavelets may be used to
a) find the velocity of light in vacuum. b) explain the particle's behaviour of light
c) find the new position of a wavefront d) explain photoelectric effect

58. In the phenomenon of interference, energy is
a) destroyedat destructive interference b) created at constructive interference
c) conserved but it is redistributed d) same at all points

59. Ratio of intensities of two waves is 9 : 1. If these waves are superimposed, what is the ratio of maximum and minimum intensities?
a) 9 : 1 b) 3 : 1 c) 4 : 1 d) 5 : 3

60. Image formed by a convex lens is virtual and erect when the object is placed
a) at F b) between F and the lens c) beyond 2F d) at 2F

61. Optical fibres are based on the phenomenon of
a) reflection b) refraction c) dispersion d) total internal reflection

62. A blue cross on a white background is illuminated with white light and is observed through a red filter.What is seen?
a) A red cross on a black background b) A black cross on a red background
c) A red cross on a blue background d) A blue cross on a red background

63. Which of the following mirrors forms a virtual smaller image?
a) plane mirror b) concave mirror c) plane and concave mirrors
d) convex mirror

64. The source of light is moving towards observer with relative velocity of 3 kms^{-1}. The fractional change in frequency of light observed is
a) 3×10^{-3} b) 3×10^{-5} c) 10^{-5} d) None of these

65. Which of the following is false for a prism placed in position of minimum deviation?
a) $i_1 = i_2$ b) $r_1 = r_2$ c) $i_1 = r_1$ d) All above

66. Two coherent mono chromatic light beams of intensities I and 4I superimpose. The maximum and minimum possible intensities in the resulting beam are:
a) 5I and I b) 5I and 3I c) 3I and I d) 9I and I

67. Angular dispersion of a prism depends upon
a) Angle of the prism b) Material of the prism c) Both d) None of these

68. Two thin lenses of power P_1 and P_2 are placed and a distance d apart.The power of the combination is:
a) $P_1 + P_2$ b) $P_1 - P_2$ c) $P_1 + P_2 - dP_1 P_2$ d) $d(P_1 + P_2)-P_1P_2$

69. The linear magnification of a concave mirror is
    a) always positive b) always negative
    c) positive or negative depending upon the position of the object d) cannot say
70. A telescope uses an objective lens of focal length f_0 and an eye lens of focal length f_e. In normal adjustment, distance between the two lenses is
    a) f_o/f_e b) f_e/f_o c) $(f_o - f_e)$ d) $(f_o + f_e)$
71. The image formed by a concave lens is
    a) always virtual b) Always real c) Always inverted d) May virtual or real
72. The minimum distance between an object and its real image formed by a convex lens of focal length cannot be
    a) Greater than 4f b) Greater than 2f c) Less than 6f d) Less than 4f
73. The direction of wavefront of a wave with the wave motion is
    a) parallel b) perpendicular c) opposite . d) at an angle of θ
74. In Young's double-slit experiment, the intensity is I at a point, where the path difference is $\frac{\lambda}{6}$ (λ - wavelength of light used). If 10 denotes the maximum intensity then $\frac{I}{I_0}$ is equal to
    a) $\frac{\sqrt{3}}{2}$ b) $\frac{1}{2}$ c) $\frac{3}{4}$ d) $\frac{1}{\sqrt{2}}$
75. The image formed by objective of a compound microscope is
    a) Virtual and enlarged b) Virtual and diminished c) Real and diminished
    d) Real and enlarged
76. A lens is behaving as convex lens in air and concave in water, then its refractive index is
    a) Small than air b) Greater than both air and water
    c) Greater than air, but less than water d) Almost equal to water
77. An interference pattern is observed by Young's double slit experiment. If now the separation between coherent sources is halved and the distance of screen from coherent sources is doubled, the new fringe width
    a) becomes double b) becomes one-fourth c) remains the same
    d) becomes four times
78. A divergent lens is one which
    a) Collect rays b) Spreads rays c) Forms real image
    d) Neither collects nor spreads rays
79. Angle of deviation caused by a prism is lens for
    a) Violet colour b) Yellow colour c) Red colour d) Is same for all colours
80. An object is held in front of a concave mirror between F and C. The image formed is
    a) at F b) at C c) beyond C d) none of the above
81. If a source is at infinity, then wavefronts reaching to observer are

a) cylindrical b) spherical c) plane d) conical

82. For any position of an object, image formed in a convex mirror is
    a) virtual b) erect c) smaller in size
    d) as far behind the mirror as the object is in front
83. Consider sunlight incident on a pinhole of width 10^3A. The image of the pinhole seen on a screen shall be
    a) a sharp white ring b) same as the geometrical image
    c) a diffused central spot, white in colour
    d) diffused coloured region around a sharp central white spot.
84. In a single diffraction pattern observed on a screen placed at D m distance from the slit of width d m, the ratio of the width of the central maxima to the width of other secondary maxima is
    a) 2 : 1 b) 1 : 2 c) 1 : 1 d) 3 : 1
85. The focal length of a double convex lens is equal to radius of curvature of either surface. The refractive index of its material is
    a) 3/2 b) 1 c) 4/3 d) none of these
86. If two sources have a randomly varying phase difference Φ(t), the resultant intensity will be given by
    a) $I_0\sqrt{2}$ b) $\frac{I_0}{2}$ c) $2I_0$ d) $\frac{I_0}{\sqrt{2}}$
87. A double slit interference experiment is carried out in air and the entire arrangement is dipped in water. The fringe width
    a) increases b) decreases c) remains unchanged.
    d) fringe pattern disappears.
88. In a room fitted with a green bulb, a red cloth will appear to be:
    a) Yellow b) Orange c) Black d) Blue
89. In a vessel of depth 15cm, liquid is poured till the liquid appears to be at half the depth, the liquid level is5cm from the top.Calculate the refractive index of the liquid.
    a) 1.33 b) 3.30 c) 1.5 d) 1.7 e) 2
90. When compact disk is illuminated by a source of white light, coloured lines are observed. This is due to
    a) dispersion b) diffraction c) interference d) refraction
91. In a concave mirror, an object is placed at a distance d_1 from the focus and the real image is formed at a distance d_2 from the focus. then the focal length of the nirror is:
    a) $\sqrt{d_1 d_2}$ b) $d_1 d_2$ c) $(d_1/d_2)^{/2}$ d) $\sqrt{d_1/d_2}$
92. The axial or longitudinal magnification of a lens is
    a) V/u b) V^2/u^2 c) $2V^2/u^2$ d) u/V
93. The Doppler effect is produced if

a) the source is in motion b) the detector is in motion c) Both (a) and (b)
d) None of the above

94. A thin film of oil is spread on the surface of water. The beautiful colours exhibited in the light of sun is due to
a) dispersion of light b) polarisation of light c) interference of light
d) diffraction of light

95. The resolving power of teleoscope is
a)
Directly proportional to the diameter (aperture) of the objective lens and inversely proportional to the wavelength of light used
b)
Directly proportional to the diameter of the objective lens and also directly proportional to the wavelength of the light used
c)
Directly proportional to the wavelength of light used and inversely proportional to the diameter of the objective lens
d) None of these

96. In a compound microscope, the distance between objective lens and eye lens is
a) fixed b) variable c) infinite d) 1 metre

97. What is path difference for destructive interference?
a) nλ b) $n(\lambda+1)$ c) $(2n+1)\frac{\lambda}{2}$ d) $(n+1)\frac{\lambda}{2}$

98. What focal length should be reading spectacles have for a person whose near point is 50 cm?
a) 25 cm b) 50 cm c) -50 cm d) -25 cm

99. A laser beam is coherent because it contains
a) waves of several wavelengths. b) incoherent waves of a single wavelength.
c) coherent waves of several wavelengths
d) coherent waves of a single wavelength.

100. An astronomical telescope has a large aperture to
a) Reduce spherical aberration b) Have high resolution
c) Increase span of observation d) Have low dispersion

101. If two mirrors are kept at 6° to each other, then the number of image formed by them is
a) 5 b) 6 c) 7 d) 8

102. An astronomical telescope has a magnifying power of 10. In normal adjustment, distance between the objective and eye piece is 22 cm. The focal length of objective lens is
a) 10 cm b) 22 cm c) 20 cm d) 2 cm

103. Two identical and independent sodium lamps act as
a) coherent source b) Either (a)and (b) c) incoherent sources d) None of these

104. When exposed to sunlight, thin films of oil on water often exhibit brilliant colours due to the phenomenon of
a) interference b) diffraction c) dispersion d) polarisation

105. f_r for green f_g and for blue f_b which statement is correct?
a) $f_r < f_g$ b) $f_g < f_r$ c) $f_b \geq f_r$ d) none of these

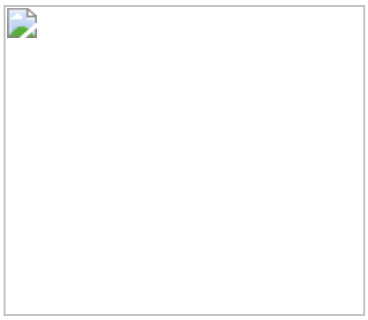
106. A plano convex lens of glass (μ= 3/2) has focal length f and radius of curvature of curved surface = R.The relation between f and R is
a) f = R b) f = R/2 c) f = 3R/2 d) f = 2R

107. Two waves are said to be coherent if they have.
a) same phase and different amplitude.
b) different frequency phase and amplitude
c) same frequency but different amplitude.
d) same frequency, phase and amplitude

108. What is the refractive index of a medium in which light travels with a speed of $2 \times 10^8\ m/s$?
a) 3/2 b) 2/3 c) 1 d) none of these

109. If a glass rod is immersed in a liquid of the same refractive index, then it will
a) look bent b) disappear c) look longer d) none of these

110. Consider a light beam incident from air to a glass slab at Brewster's angle as shown in Figure.
A polaroid is placed in the path of the emergent ray at point P and rotated about an axis passing through the centre and perpendicular to the plane of the polaroid.



a)
For a particular orientation there shall be darkness as observed through the polaroid
b)
The intensity of light as seen through the polaroid shall be independent of the rotation.

c)

The intensity of light as seen through the polaroid shall go through a minimum but not zero for two orientations of the polaroid.

d)

The intensity of light as seen through the polaroid shaU go through a minimum for four orientations of the polaroid.

111. Polarizing angle for a medium is 60°. Its refractive index is
a) 1.732 b) 1 c) 1.414 d) 2

112. Polarisation of light proves
a) corpuscular nature of light b) quantum nature of light.
c) transverse wave nature of light d) longitudinal wave nature of light.

113. A lens behaves as converging lens in air and a diverging lens in water.The μ of the material of the lens is
a) 1.33 b) > 1.33 c) < 1.33 d) 1

114. Refractive index of diamond is about
a) 1.33 b) 1.5 c) 1 d) 2.45

115. For light diverging from a point source
a) The wavefront is spherical
b) The intensity decrease in proportion to the distance squared
c) The wavefront is parabolic
d) The intensity at the wavefront does not depend on the distance

116. When an object is held between pole and focus of concave mirror, the image formed is
a) virtual and diminished b) virtual and enlarged c) real and inverted
d) real and enlarged

117. One dioptre is the power of a lens of focal length
a) 1 cm b) 1 m c) -1 cm d) -1 m

118. In diffraction from a single slit the angular width of the central maxima does not depends on
a) λ of light used b) width of slit c) distance of slits from the screen D
d) ratio of λ and slit width.

119. The ratio of maximum and minimum intensities of two sources is 4 : 1.The ratio of their amplitudes is
a) 1 : 81 b) 3 : 1 c) 1 : 9 d) 1 : 16

120. The sky appear blue because
a) Red light is absorbed b) Blue light is scattered the most
c) Blue light is absorbed d) It is its natural colour

121. Resolving power of telescope can be increased by increasing

a) the wavelength b) the diameter of objective c) the diameter of eyepiece
d) the focal length of eyepiece

122. According to Huygens' principle, each point of the wavefront is the source of
a) secondary disturbance b) primary disturbance c) third disturbance
d) fourth disturbance

123. The phenomenon of polarisation indicates the light is of
a) longitudinal nature b) transverse nature c) particle nature d) None of these

124. A convex lens of glass is immersed in water.Compared to its power in air, its power in water will
a) Diminish for red light and increase for blue light b) Not change at all
c) Increase d) Diminish

125. Consider sunlight incident on a slit of width 10^4 A. The image seen through the slit shall darkness as observed through the polaroid
a) Be a fine sharp slit white in colour at the centre
b) A bright slit white at the centre diffusing to zero intensities at the edges
c) A bright slit white at the centre diffusing to regions of different colours
d) only be a diffused slit white in colour

126. Diamond sparkles because of
a) scattering of light b) reflection of light c) TIR of light d) None

127. The splitting of white light into several colours on passing through a glass prism is due to
a) refraction b) reflection c) interference d) diffraction

128. In Young's double slit experiment, if the monochromatic source of yellow light is replaced by red light, the fringe width
a) increases b) decreases. c) remains unchanged. d) the fringes disappear

129. Wavelength of light frequency 100Hz is
a) 2 x 10^6 m b) 3 x 10^6 m c) 4 x 10^6 m d) 5 x 10^6 m

130. The focal length of a convex lens (μ = 3/2) in air is 20cm.When immersed in water (μ = 4/3) its, focal length will be
a) 80cm b) 26.7cm c) 20cm d) 5cm

131. In going from a rarer to a denser medium, light loses some speed. What happens to energy carried by the light waves?
a) decreases b) increases c) remains the same d) none of the above

132. For a total magnification of 175 from a compound microscope, the magnification produced by objective is 7. What should be the magnification produced by eye piece?
a) 7 b) 25 c) 175×7 d) none of these

133. Which of the following cannot be polarized?

a) X-rays b) radio waves c) sound waves d) light waves

134. The linear magnification of an image is m.The magnification for area will be
a) m b) m^2 c) $m^{1/2}$ d) m^4

135. Image of an object in a concave mirror is
a) always real b) always virtual c) always erect
d) real or virtual depending on position of object

136. An unpolarised beam of intensity I_0 is incident on a pair of nicols making angle of 60° with each other. The intensity of right emerging from the pair is
a) I_0 b) $\frac{I_0}{2}$ c) $\frac{I_0}{4}$ d) $\frac{I_0}{8}$

137. According to Huygens' principle, light is a form of
a) particle b) rays c) wave d) radiation

138. To get three images of a single object, t one should have two plane mirrors at an angle of:
a) 60° b) 90° c) 120° d) 30°

139. The angle of prism is 60^0 and the refractive index of the material of prism is 1.5.If angles of incidence and emergence at first and second refracting faces are i_1 and i_2, then for minimum deviation:
a) $i_1 = 0$ b) $i_1 < i_2$ c) $i_1 > i_2$ d) $i_1 = i_2$

140. For an aperture of 2mm and wavelength of 500nm, fresnel distance is
a) 5m b) 8m c) 10m d) 40m

141. One cannot see through fog because
a) fog absorbs light b) light is scattered by the droplets in fog
c) light duffers total internal reflection at the droplets in fog
d) the refractive index of fog is infinity

142. The ratio of the speed of an object to the speed of its real image of magnification m in the case of a convex mirror is
a) $-\frac{1}{m^2}$ b) m^2 c) -xm d) $\frac{1}{m}$

143. When diameter of objective of an astronomical telescope is doubled, its limit of resolution is
a) doubled b) quadrapled c) halved d) unaffected

144. Light seems to propagate in rectilinear path because
a) its speed is very large b) its wavelength is very small
c) reflected from the upper surface of atmosphere
d) it is not absorbed by atmosphere

145. Two lenses of focal lengths 20 cm and -40 cm are held in contact. The image of an object all infinity will be formed by the combination at
a) ∞ b) 20 cm c) 40 cm d) 60 cm

146. The image formed by a convex lens is

a) Always virtual b) Always real c) Always inverted d) May virtual or real

147. The angle of incidence at which reflected light is totally polarised for reflection from air to glass (refractive index n) is
a) $\sin^{-1}(n)$ b) $\sin^{-1}\left(\frac{1}{n}\right)$ c) $\tan^{-1}\left(\frac{1}{n}\right)$ d) $\tan^{-1}(n)$

148. The angle of polarisation (Brewster's angle) for an incident light when it is incident on a surface of refractive index (n) will be)
a) $\sin^{-1}(n)$ b) $\tan^{-1}(n)$ c) $\cos^{-1}(n)$ d) $\tan^{-1}\left(\frac{1}{n}\right)$

149. In the context of Doppler effect in light, the term red shift signifies
a) decrease in frequency b) increase in frequency c) decrease in intensity
d) increase in intensity

150. Refractive index of glass w.r.t. water is 9/8. What is the speed of light in water? Given speed of light in glass is $2 \times 10^8\ m/s$.
a) $2 \times 10^8\ m/s$ b) $3 \times 10^8\ m/s$ c) $2.25 \times 10^8\ m/s$ d) none of these

151. For total internal reflection, light must travel
a) from rarer to denser medium b) from denser to rarer medium c) in air only
d) in water only

152. A simple microscope consisting of a lens of focal f forms final image at distance of distinct vision d.Its magnifying power is
a) 1+(d/f) b) (d/f)-1 c) d/f d) 1-(d/f)

153. A plane mirror is approaching you at 5 cm per second. You can see your can see your image in it. At what speed will your image approach you?
a) 10 cm per sec. b) 5 cm per sec. c) 20 cm per sec. d) 15 cm per sec.

154. The correct mirror equation is
a) $\frac{1}{f} = \frac{1}{v} + \frac{1}{u}$ b) $\frac{1}{f} = \frac{1}{v} - \frac{1}{u}$ c) $\frac{1}{f} = \frac{1}{u} - \frac{1}{v}$ d) none of these

155. For a normal eye, distance of near point from the eye is
a) ∞ b) 25 cm c) 25 m d) none of these

156. Which one of the following phenomena confirms that light waves are transverse?
a) interference b) diffraction c) dispersion d) polarization

157. In Huygens' wave theory, the locus of all points in the same state of vibration is called
a) a half period zone b) oscillator c) a wavefronts d) a ray

158. Two thin lenses of focal length f_1 and f_2 are placed coaxially in contact.The combination acts as a single lens of focal length
a) $f_1\ f_2\ /\ (f_1+f_2)$ b) $\sqrt{f_1 f_2}$ c) $(f_1+f_2)\ /\ f_1\ f_2$ d) $f_1+f_2\ /2$

159. The focal length of a lens depends on
a) The radii of curvature of its surfaces b) The refractive index of its material
c) The refractive index of the medium surrounding the lens d) All the above facors

160. What should be the slit width to obtain 10 maxima of the double slit pattern within the central maxima of the single slit pattern of slit width 0.4 mm?
a) 0.4 mm b) 0.2 mm c) 0.6 mm d) 0.8 mm

161. In single slit diffraction pattern, how does the width of central maximum change when light of smaller wavelength is used?
a) decreases b) increases c) remains unaffected d) cannot be predicted

162. In case of linearly polarised light, the magnitude of the electric field vector
a) is parallel to direction of propagation b) does not change with time.
c) increase and decrease linearly with time. d) varies periodically with time

163. Figure shows a standard two slit arrangement with slits S_1, S_2, P_1, P_2 are the two minima points on either side of P (Figure). At P_2 on the screen, there is a hole and behind P2 is a second 2- slit arrangement with slits S_3, S_4 and a second screen behind them

a)
There would be no interference pattern on the second screen but it would be lighted.
b) The second screen would be totally dark.
c) There would be a single bright point on the second screen
d) There would be a regular two slit pattern on the second screen.

164. When a red flower is seen through a green glass, it appear
a) red b) green c) yellow d) black

165. The interference is produced by two waves of intensity ratio 16 : 9. The ratio of maximum and minimum intensities in interference pattern is
a) 4:3 b) 49:1 c) 25:7 d) 256:81

166. The power of the combination of a convex lens of focal length 50cm and concave lens of focal length 40cm is
a) +1 diopter b) -1 diopter c) 0 d) +0.5 diopter e) -0.5 diopter

167. When light is refracted into a denser medium
a) its wavelength and frequency both increases
b) its wavelength increases but frequency remains unchanged .
c) its wavelength decreases -,but frequency remains the same
d) its wavelength and frequency both decreases

168. A convergent lens is one which

a) Collect rays b) Spreads rays c) Forms real image d) Forms virtual image

169. If the width of slit is decreased in a single slit diffraction, then the width of central maxima will
a) increase b) decrease c) remain unchanged
d) not depend on the width of slot

170. The number of images observable between two parallel plane mirrors is
a) 2 b) 4 c) 11 d) Infinite

171. You are given a prism, a lens and a slab all made of same material.Which has maximum dispersive power
a) Prism b) Lens c) Slab d) All have equal dispersive powers

172. When a prism is placed in the position of minimum deviation, the ray of light within the prism
a) Goes parallel to the base b) Goes perpendicular to the base
c) Makes minimum angle with the base
d) Direction is not fixed relative to the base

173. Units of dispersive power is
a) Radian b) Radian / metre c) No units d) None

174. The correct formula for magnifying power of a simple microscope is
a) $m = \left(1 + \frac{f}{d}\right)$ b) $m = \left(1 - \frac{d}{f}\right)$ c) $m = \left(1 + \frac{d}{f}\right)$ d) $m = \left(1 - \frac{f}{d}\right)$

175. A monochromatic light refracts by the medium of refractive index 1.5 in vacuum. The wavelength of refracted wave will be
a) equal b) increases c) decrease
d) depend upon the intensity of refractedlight

176. If a lens is cut into two pieces perpendicular to the principal axis and only one part is used, the new focal length
a) Remains same b) Becomes 1/2 time c) Becomes 2 time d) Infinite

177. A convex mirror has a focal length 20 cm. A convergent beam tending to con verge to a point 20 cm behind the mirror on principal axis fall on it. The image is formed at
a) infinity b) 40cm c) 20cm d) 10cm

178. It is possible to observe total internal reflaction when a ray travels from
a) Air to water b) Air into glass c) Water into glass d) Glass into water

179. In Young's double slit experiment two disturbance arriving at a point P have phase difference of π / 2 The intensity of this point expressed as a fraction of maximum intensity I_0 is
a) $\frac{3}{2}I_0$ b) $\frac{1}{2}I_0$ c) $\frac{4}{3}I_0$ d) $\frac{3}{4}I_0$