# Ravi home tutions

## 12th Standard

## Physics

Total Marks: 504

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Multiple Choice Question 37 x 1 = 37

Q1. A plane glass is placed over a various coloured letters (violet, green, yellow, red) The letter which appears to be raised more is _____.

(a) red (b) yellow (c) green (d) violet

Q2. Two point white dots are 1 mm apart on a black paper. They are viewed by eye of pupil diameter 3 mm approximately. The maximum distance at which these dots can be resolved by the eye is_____. [take wavelength of light, λ = 500 nm]

(a) 1 m (b) 5 m (c) 3 m (d) 6 m

Q3. In a Young's double-slit experiment, the slit separation is doubled. To maintain the same fringe spacing on the screen, the screen-to-slit distance D must be changed to, _____.

(a) 2D (b) $\frac{D}{2}$ (c) $\sqrt{2}$D (d) $\frac{D}{\sqrt{2}}$

Q4. Two coherent monochromatic light beams of intensities I and 4I are superposed. The maximum and minimum possible intensities in the resulting beam are _____.

(a) 5I and I (b) 5I and 3I (c) 9I and I (d) 9I and 3I

Q5. When light is incident on a soap film of thickness 5 x $10^{-5}$ cm, the wavelength of light reflected maximum in the visible region is 5320 Å. Refractive index of the film will be, _____.

(a) 1.22 (b) 1.33 (c) 1.51 (d) 1.83

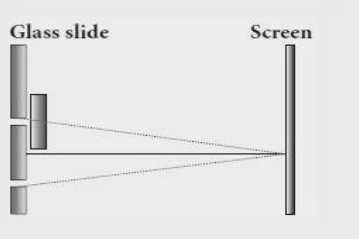
Q6. First diffraction minimum due to a single slit of width 1.0 x $10^{-5}$ cm is at 30°. Then wavelength of light used is,_____.

(a) 400 $\mathring{A}$ (b) 500 $\mathring{A}$ (c) 600 $\mathring{A}$ (d) 700 $\mathring{A}$

Q7. A ray of light strikes a glass plate at an angle 60°. If the reflected and refracted rays are perpendicular to each other, the refractive index of the glass is, _____.

(a) $\sqrt{3}$ (b) $\frac{3}{2}$ (c) $\sqrt{\frac{3}{2}}$ (d) 2

Q8. One of the of Young's double slits is covered with a glass plate as shown in figure. The position of central maximum will,_____.




(a) get shifted downwards (b) get shifted upwards
(c) will remain the same (d) data insufficient to conclude

Q9.Light transmitted by Nicol prism is, _____.
(a) partially polarised (b) unpolarised (c) plane polarised
(d) elliptically polarised

Q10.The transverse nature of light is shown in,
(a) interference (b) diffraction (c) scattering (d) polarisation

Q11.A rear mirror of a vehicle is cylindrical having a radius of curvature of 10 cm. The length of the arc of the curved surface is also 10 cm. If the eye of the driver is assumed to be at a large distance, from the mirror, then the field of view in radian is _____.
(a) 0.5 (b) 1 (c) 2 (d) 4

Q12.A point object is placed at the center of a glass sphere of radius 6cm and refractive index 1.5. The distance of the virtual image from the surface of the sphere is _____.
(a) 2 cm (b) 4 cm (c) 6 cm (d) 12 cm

Q13.An equal convex lens of focal length 20cm is cut along a plane perpendicular to the principal axis into two equal parts. The ratio of the focal length of new lenses furred is _____.
(a) 1: 1 (b) 1: 2 (c) 2: 1 (d) $2 : \frac{1}{2}$

Q14.The distance between an object and a divergent lens is m times the focal length of the lens. The linear magnification produced by the lens will be equal to _____.
(a) m (b) $\frac{1}{\mathrm{m}}$ (c) m + 1 (d) $\frac{1}{m+1}$

Q15.A ray of light is traveling in the direction $\frac{1}{2}(i+\sqrt{3j})$ s incident on a plane mirror' After reflection, it travels along with the directions $\frac{1}{2}(i-\sqrt{3j})$. The angle of incidence is _____.
(a) $30^{o}$ (b) $45^{o}$ (c) $60^{o}$ (d) $75^{o}$

Q16.When a light wave goes from air into water medium, the quantity that remains unchanged _____.
(a) speed (b) amplitude (c) frequency (d) wavelength

Q17. Diameter of a Plano -Convex lens 6 cm and thickness at the centre is 3mm. If the speed of light in the material of the lens is 2 x $10^8$m /s, focal length of the lens is _____.

(a) 15 cm (b) 20 cm (c) 30 cm (d) 10 cm

Q18. In the formation of a rainbow light from the sun on water droplets undergoes _____.

(a) dispersion (b) only total internal reflection

(c) dispersion and total internal reflection (d) none of these

Q19. Which of the following colours suffers maximum deviation in a prism?

(a) yellow (b) blue (c) green (d) orange

Q20. An object of size 3 cm is placed to 4 cm in front of a concave lens of focal length 21 cm. Find the height the image.

(a) 8.4 cm (b) 1.8 cm (c) 3 cm (d) 4 cm

Q21. A screen is placed 90cm from an object the image of the object on the screen is formed by a convex lens at two different locations separated by 20cm. Determine the focal length of the lens.

(a) 21 cm (b) 21.3 cm (c) 24 cm (d) 20 cm

Q22. For a glass prism n = $\sqrt{3}$ the angle of minimum deviation is equal to the angle of prism. Find the angle of prism.

(a) 30° (b) 60° (c) 45° (d) 90°

Q23. A thin prism P with angle 40 and made from glass of refractive index 1.54 combined with another thin prism P, made from glass of refractive index 1.72 to produce without deviation. The angle of the prism $P_2$ is _____.

(a) 5.33° (b) 4° (c) 3° (d) 2.6°

Q24. A convex lens of focal length 1.0 m and a concave lens of focal length 0.25 m are 0.75 m part. A parallel beam of light is incident in the convex lens. The beam entering at the refraction from both lenses is _____.

(a) parallel to principal axis (b) convergent (c) divergent

(d) none of these.

Q25. For an angle of incidence $\theta$ on an equilateral prism of refractive index $\sqrt{3}$. The ray refracted is parallel to the base inside the prism. The value of $\theta$ is _____.

(a) 30° (b) 45° (c) 60° (d) 75°

Q26. The angular resolution of a 10cm diameter telescope at a wave length of 5000A° is of the order of _____.

(a) $10^{-6}$ rad (b) $10^{-2}$ rad (c) $10^{-4}$ rad (d) $10^{6}$ rad

Q27. Sun is visible a little before the actual sunrise and until a little after the actual sunset this is due to _____.

(a) total internal reflection (b) reflection (c) refraction

(d) polarisation

Q28. Which colour of light has the highest speed?

(a) Violet (b) Red (c) Green (d) All have same speed

Q29. Number of images produced by two parallel plane mirrors is _____.

(a) infinity (b) zero (c) 3 (d) 8

Q30. Photo electric cell or photo cell is a device which converts

(a) light energy into electrical energy

(b) electrical energy into light energy

(c) electrical energy into photons (d) light energy into photons

Q31. When two monochromatic lights of frequency, v and $\frac{v}{2}$ are incident on a photoelectric metal, their stopping potential becomes $\frac{V_s}{2}$ and $V_s$ respectively. The threshold frequency for this metal is

(a) 2v (b) 3v (c) $\frac{2}{3}$v (d) $\frac{3}{2}$v

Q32. Two light waves from slit $S_1$ and $S_2$ on reaching points P and Q on a screen in Young's double slit experiment have a path diference zero and $\frac{\lambda}{4}$ respectively. The ratio of light intensities at P and Q will be _____.

(a) 4 : 1 (b) 3 : 2 (c) $\sqrt{2} : 1$ (d) 2 : 1

Q33. An astronomical telescope has objective and eye-piece of focal length 40 cm, 4 cm respectively. To view an object 200 cm away from the objective, the lenses must be separated by a distance.

(a) 46.0 cm (b) 50.0 cm (c) 54.0 cm (d) 37.8 cm

Q34. The magnification of a telescope is given by

(a) $\frac{f_e}{f_o}$ (b) $\frac{f_o}{f_e}$ (c) $\frac{2f_e}{f_o}$ (d) $\frac{f_0+f_e}{2}$

Q35. A screen is placed 90 cm from an object. The image of the object on the screen is formed by a convex lens at two different locations separated by 20 cm. Determine the focal length of the lens.

(a) 21 cm (b) 21.3 cm (c) 24 cm (d) 20 cm

Q36.Two polaroids $P_1$ and $P_2$ are placed with their optic axes perpendicular to each other. If an unpolarised light of intensity I, isincident on the first polaroid $P_1$ then the intensity of transmitted light through the second polaroid$P_2$ will be:

(a) $I_o/2$ (b) $I_0/4$ (c) 0 (d) $I_0/8$

Q37.A beam of unpolarised light is incident on a reflecting glass surface at an angle of 57.5° then the angle between the reflected and refracted beam wil be

(a) $45^0$ (b) $60^0$ (c) 90° (d) $30^0$

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2 Marks 87 x 2 = 174

Q38.What is Rayleigh's scattering?

Q39.What are the salient features of corpuscular theory of light?

Q40.What are the important points of wave theory of light?

Q41.What is the significance of electromagnetic wave theory of light?

Q42.Write a short note on quantum theory of light.

Q43.Define wavefront.

Q44.State Huygens' principle.

Q45.What is interference of light?

Q46.What is phase of a wave?

Q47.Obtain the relation between phase difference and path difference.

Q48.What are coherent sources?

Q49.How does wavefront division provide coherent sources?

Q50.How do source and images behave as coherent sources?

Q51.What is bandwidth of interference pattern?

Q52.What is diffraction?

Q53.Differentiate between Fresnel and Fraunhofer diffraction.

Q54.Discuss the special cases on first minimum in Fraunhofer diffraction.

Q55.Mention the differences between interference and diffraction.

Q56.What is call 'grating element'?

Q57.What is polarisation?

Q58.Discuss polarisation by selective absorption.

Q59.What are polariser and analyser?

Q60.State Brewster's law.

Q61.What is double refraction?

Q62.Mention the types of optically active crystals with example.

Q63.Discuss about Nicol prism.

Q64.How is polarisation of light obtained by scattering of light?

Q65.What are near point and normal focusing?

Q66.Why is oil immersed objective preferred in a microscope?

Q67.What is the use of an erecting lens in a terrestrial telescope?

Q68.What are the uses of spectrometer?

Q69.What is myopia? What is its remedy?

Q70.What is hypermetropia? What is its remedy?

Q71.What is presbyopia?

Q72.What is astigmatism? What is its remedy?

Q73.A beam of light of wavelength 600 nm from a distant source falls on a single slit 1 mm wide and the resulting diffraction pattern is

observed on a screen 2 m away. What is the distance between the first dark fringes on either side of the central bright fringe?

Q74. The wavelength of light from sodium source in vacuum is 5893Å. What are its
(a) wavelength,
(b) speed and
(c) frequency when this light travels in water which has a refractive index of 1.33.

Q75. Two light sources of equal amplitudes interfere with each other. Calculate the ratio of maximum and minimum intensities.

Q76. Two light sources have intensity of light as $I_0$. What is the resultant intensity at a point where the two light waves have a phase difference of $\pi/3$?

Q77. The wavelength of a light is 450 nm. How much phase it will differ for a path of 3 mm?

Q78. Calculate the distance upto which ray optics is a good approximation for light of wavelength 500 nm falls on an aperture of width 0.5 mm.

Q79. A diffraction grating consists of 4000 slits per centimeter. It is illuminated by a monochromatic light. The second order diffraction maximum is produced at an angle of 30°. What is the wavelength of the light used?

Q80. A monochromatic light of wavelength of 500 nm strikes a grating and produces fourth order maximum at an angle of 30°. Find the number of slits per centimeter.

Q81. The optical telescope in the Vainu Bappu Observatory at Kavalur has an objective lens of diameter 2.3 m. What is its angular resolution if the wavelength of light used is 589 nm?

Q82. Two polaroids are kept with their transmission axes inclined at $30^o$. Unpolarised light of intensity I falls on the first polaroid. Find out the intensity of light emerging from the second polaroid.

Q83. Two polaroids are kept crossed (transmission axes at $90^o$ ) to each other.
(a) What will be the intensity of the light coming out from the second polaroid when an unpolarised light of intensity I falls on the first polaroid?
(b) What will be the intensity of light coming out from the second polaroid if a third polaroid is kept in between at $45^o$ inclination to both of them.

Q84. Find the polarizing angles for
(i) glass of refractive index 1.5 and
(ii) water of refractive index 1.33.

Q85. What is the angle at which a glass plate of refractive index 1.65 is to be kept with respect to the horizontal surface so that an unpolarised light travelling horizontal after reflection from the glass plate is found to be plane polarised?

Q86. A microscope has an objective and eyepiece of focal lengths 5 cm and 50 cm respectively with tube length 30 cm. Find the magnification of the microscope in the
(a) near point and
(b) normal focusing.

Q87. Calculate the power of the lens of the spectacles needed to rectify the defect of nearsightedness for a person who could see clearly up to a distance of 1.8 m.

Q88. A person has farsightedness with the far distance he could see clearly is 75 cm. Calculate the power of the lens of the spectacles needed to rectify the defect.

Q89. Write the difference of real and virtual images by a plane mirror.

Q90. What is known as constructive interference?

Q91. What is known as destructive interference?

Q92. Define bandwidth.

Q93. What is meant by correspoding points?

Q94. Write the expression for angular resolution.

Q95. Write the uses of nicol prism.

Q96. Define interference of light.

Q97. Why is the interference pattern not detected when two coherent sources are far apart?

Q98. No interference pattern is detected when two coherent sources are infinitely close to each other. Why?

Q99. A telescope has been adjusted for relaxed eye. You are asked to adjust it for least distance of distinct vision, then how will you change the distance between two lenses?

Q100. Why can't we see clearly through fog? Name the phenomenon responsible for it.

Q101. Does the magnifying power of a microscope depend on the colour of the light used? Justify your answer.

Q102. How does the power of a convex lens vary, if the incident red light is replaced by violet light?

Q103. How does the fringe width of interference fringes change, when the whole apparatus Young's experiment is kept in water (refractive index 4/3)?

Q104. In a single-slit diffraction experiment, the width of the slit is made double the original width. How does this affect the size and intensity of the central diffraction band?

Q105. What are coherent sources of light?

Q106. What will be the effect on interference fringes if red light is replaced by blue light?

Q107. If the angle between the pass axes of a polariser and analyser is 45°. Write the ratio of the intensities of original light and the transmitted light after passing through the analyser.

Q108. Which of the following waves can be polarized
(i) Heat waves
(ii) Sound waves? Give reason to support your answer.

Q109. A convex lens is held in water. What would be the change in the focal length?

Q110. Briefly explain, how the focal length of a convex lens changes with increases in wavelength of incident light.

Q111. Images formed by totally reflected light are brighter than the images formed by ordinary reflected light. Why?

Q112. Light of wavelength 600 nm that falls on a pair of slits producing interference pattern on a screen in which the bright fringes are separated by 7.2 mm. What must be the wavelength

of another light which produces bright fringes separated by 8.1 mm with the same apparatus?

Q113. The ratio of maximum and minimum intensities in an interference pattern is 36 : 1. What is the ratio of the amplitudes of the two interfering waves?

Q114. What are the shapes of wavefront for
(a) source at infinite,
(b) point source and
(c) line source?

Q115. What is intensity (or) amplitude division?

Q116. What is resolution?

Q117. What is Rayleigh's criterion?

Q118. What is the difference between resolution and magnification?

Q119. What is the use of collimator in a spectrometer?

Q120. In Young's double slit experiment, 62 fringes are seen on a screen for sodium light of wavelength 5893 Å. If violet light of wavelength 4359 Å is used in place of sodium light, how many fringes will be seen?

Q121. What is a diffraction grating?

Q122. What are the techniques to polarise the unpolarised light?

Q123. What are the two rays in double refraction? and mention the differences between two?

Q124. What sources are said to be 'incoherent sources'?

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3 Marks 30 x 3 = 90

Q125. What is Fresnel's distance? Obtain the equation for Fresnel's distance.

Q126. Differentiate between polarised and unpolarised light.

Q127. What are plane polarised, unpolarized and partially polarised light?

Q128. State and obtain Malus' law. (or) State Malus' Law.

Q129. List the uses of polaroids.

Q130. What is angle of polarisation and obtain the equation for angle of polarisation.

Q131. Discuss about pile of plates.

Q132. What are the advantages and disadvantages of a reflecting telescope?

Q133. Explain about compound microscope and obtain the equation for the magnification.

Q134. Discuss about astronomical telescope.

Q135. A compound microscope has a magnifying power of 100 when the image is formed at infinity. The objective has a focal length of 0.5 cm and the tube length is 6.5 cm. What is the focal length of the eyepiece.

Q136. Two light sources with amplitudes 5 units and 3 units respectively interfere with each other. Calculate the ratio of maximum and minimum intensities.

Q137. In Young's double slit experiment, the two slits are 0.15 mm apart. The light source has a wavelength of 450 nm. The screen is 2 m away from the slits.
(a) Find the distance of the second bright fringe and also third dark fringe from the central maximum.
(b) Find the fringe width.
(c) How will the fringe pattern change if the screen is moved away from the slits?
(d) What will happen to the fringe width if the whole setup is immersed in water of refractive index 4/3.

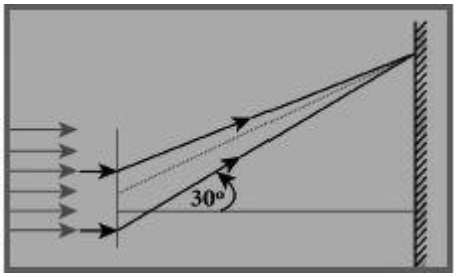
Q138. Lights of two wavelengths 560 nm and 420 nm are used in Young's double slit experiment. Find the least distance from the central fringe where the bright fringes of the two wavelengths coincide. Given D = 1 m and d = 3 mm.

Q139. Find the minimum thickness of a film of refractive index 1.25, which will strongly reflect the light of wavelength 589 nm. Also

find the minimum thickness of the film to be anti-reflecting.

Q140. Light of wavelength 500 nm passes through a slit of 0.2 mm wide. The diffraction pattern is formed on a screen 60 cm away. Determine the,
(a) angular spread of central maximum
(b) the distance between the central maximum and the second minimum.

Q141. A monochromatic light of wavelength 5000 Å passes through a single slit producing diffraction pattern for the central maximum as shown in the figure. Determine the width of the slit.




Q142. A man with a near point of 25 cm reads a book which has small print using a magnifying lens of focal length 5 cm.
(a) What are the closest and the farthest distances at which he should keep the lens from the book?
(b) What are the maximum and the minimum magnification possible?

Q143. A small telescope has an objective lens of focal length 125 cm and an eyepiece of focal length 2 cm.
(a) What is the magnification of the telescope?
(b) What is the separation between the objective and the eyepiece?
(c) What is the angular separation between two stars when viewed through this telescope if they subtend 1' for bare eye?

Q144. What are the conditions for obtaining clear and broad interference bands?

Q145. Discuss diffraction at single slit and obtain the condition for $n^{th}$ maximum.

Q146. What are Airy's discs?

Q147. Write the drawbacks of Nicol prism.

Q148. Light of wavelength of 5000 Å produces diffraction pattern of the single slit of width 2.5 μm. What is the maximum order of diffraction possible?

Q149. $I_0$ is the intensity of light existing between two cross Polaroids kept with their axes perpendicular to each other. A third polaroid is introduced between them. What must be the angle between the axes of first and the newly introduced polaroid to get the maximum light from the whole arrangement?

Q150. An unpolarised light of intensity 32 $Wm^{-2}$ passes through three Polaroids such that the axes of the first and the last Polaroids are at 90°. What is the angle between the axes of the first and middle Polaroids so that the emerging light has an intensity of only 3 $Wm^{-2}$?

Q151. The reflected light is found to be plane polarised when an unpolarized light falls on a denser medium at 60° with the normal. Find the angle of refraction and critical angle of incidence for total internal reflection in the denser to rarer medium reflection.

Q152. The near point and the far point for a person are 50 cm and 500 cm, respectively. Calculate the power of the lens the person should wear to read a book held in hand at 25 cm. What maximum distance is clearly visible for the person with this lens on the eye?

Q153. State and prove Brewster's law.

Q154. Distinguigh between Fresnel Diffraction and Fraun hofer.

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5 Marks 39 x 5 = 195

Q155. Prove law of reflection using Huygens' principle.

Q156. Prove law of refraction using Huygens' principle.

Q157. Obtain the equation for resultant intensity due to interference of light.

Q158. Explain the Young's double slit experimental setup and obtain the equation for path difference.

Q159. Discuss the interference in thin films and obtain the equations for constructive and destructive interference for transmitted and reflected light.

Q160. Discuss the diffraction at a grating and obtain the condition for the $m^{th}$ maximum.

Q161. Discuss the experiment to determine the wavelength of monochromatic light using diffraction grating.

Q162. Discuss the experiment to determine the wavelength of different colours using diffraction grating.

Q163. Obtain the equation for resolving power of optical instruments.

Q164. Discuss about the simple microscope and obtain the equations for magnification for near point focusing and normal focusing.

Q165. Explain the experimental determination of refractive index of the material of the prism using spectrometer.

Q166. Obtain the equation for bandwidth in Young's double slit experiment.

Q167. Mention different parts of spectrometer and explain the preliminary adjustments.

Q168. Find the intensity at a point on a screen in Young's double-slit experiment where the interfering waves of equal intensity have a path difference.
(i) $\frac{\lambda}{4}$, and (ii) $\frac{\lambda}{3}$

Q169. The critical angle for a given piece of glass is 45°. Calculate the polarising angle for it. Also calculate the angle of refraction when light is incident on this glass at an angle of incident equal to $i_p$.

Q170. You are given two converging lenses of focal lengths 1.25 cm and 5 cm to design a compound microscope. If it is desired to have a magnification of 30, find out the separation between the objective and the eyepiece.

Q171. The total magnification produced by a compound microscope is 20. The magnification produced by the eyepiece is 5. The microscope is focused on a certain object. The distance between the objective and eyepiece is observed to be 14 cm. If the least distance of distinct vision is 20 cm, calculate the focal length of the objective and the eyepiece.

Q172. A small telescope has an objective lens of focal length 150 cm and an eyepiece of focal length of 5 cm. What is the magnifying power of the telescope for viewing the distant objects in normal adjustment?
If this telescope is used to view a 100 m tall tower 3km away,

what is the height of the image of the tower formed by the objective lens?

Q173. In young's double slit experiment, the angular width of a fringe is found to be $0.2^{o}$ on a screen placed 1m away. The wavelength of light used is 600 nm. What will be the angular width of the fringe if the entire experimental apparatus is immersed in water? Take refractive index of water as $\frac{4}{3}$.

Q174. A Parallel beam of light of 500 nm falls on a narrow slit and be resulting diffraction pattern is observed on a screen 1m away. It is observed that the first minimum is at a distance of 2.5 mm from the centre of the screen. Calculate the width of the slit.

Q175. If the focal lengths of the objective and eyepiece of a microscope are 2 cm and 5 cm and 5 cm respectively and the distance between them is 20 cm, what is the distance of the object from the objective when the image seen by the eye is 25 cm from eyepiece? Also find the magnifying power.

Q176. An optical instrument used for angular magnification has a 25 D objective and a 20D eyepiece. The tube length is 25 cm when the eye is least strained. (a) Whether it is a microscope or a telescope? (b) What is the angular magnification produced?

Q177. In Young's experiment, the upper slit is covered by a thin glass plate of refractive index 1.4 while the lower slit is covered by another glass plate having the same thickness as the first one but having refractive index 1.7. Interference pattern is observed using light of wavelength 5400 Å. It is observed that the point P on the screen where the central maximum (n = 0) fell before the glass were inserted now has $\frac{3}{4}$ th original intensity. It is further observed that what used to be the fifth maximum earlier, lies below the point P while the sixth minimum lies above P. Calculate the thickness of the glass plate.

Q178. The eyepiece and objective of a microscope having focal lengths of 0.03 m and 0.04 m respectively are separated by a distance 0.2 m. Now the eyepiece and the objective are to be interchanged such that the angular magnification of the instrument remains the same. What is the separation between the lenses?

Q179. In double-slit experiment, $SS_2$ is greater than SSI by 0.25 A. Calculate the path difference between two interfering beams from $S_1$ and $S_2$ for minima and maxima on the screen.

Q180. Two polaroids are set in crossed positions. A third polaroid is placed between the two making an angle e with the pass axis of the first polaroid. Write the expression for the intensity of light transmitted from the second polaroid. In what orientations will the transmitted intensity be
(i) minimum and
(ii) maximum.

Q181. If a particle is thrown horizontally at a speed of $3 \times 10^8 ms^{-1}$, deduce the verticalfall in traveling 1 km distance. Given: g = 10 $ms^{-2}$, Does that result depend upon the mass of the particle? Comment on your result, considering that Newton thought light is made up of corpuscles that at a very large speed by the source

Q182. Light of wavelength 5000 Å falls on a plane reflecting surface. What are the wavelength and frequency of reflected light? For what angle of incidence is the reflected ray normal to the incident ray?

Q183. A telescope has an objective of diameter 60 cm. The focal lengths of the objective and eyepiece are 2.0 m and 1.0 cm respectively. The telescope is directed to view two distant almost point sources of light, (e.g., two stars of a binary). The sources are roughly at the same distance = $10^4$ light years along the line of sight but are separated transversely to the line of sight by a distance of 1010 m. Will the telescope resolve the two objects i.e. will it see two distant stars?

Q184. Prove the laws of reflection using Huygen's principle.

Q185. Discuss diffraction at single slit and obtain the condition for $n^{th}$ minimum.

Q186. Obtain the equation for resolving power of microscope.

Q187. Describe about polarisation by reflection.

Q188. Discuss some common defects of vision in the eye.

Q189. The Intensity ratio of the maxima and minima in an interference pattern produced by two coherent sources of light is 9 : 1. The intensity of the used light sources are in ratio.

Q190. Two points separated by a distance of 0.1 mm can just by resolved in a microscope when a light of wavelength 6000 $A^o$ is used. What is the light of reflection of wave length 4800 $A^o$ is used?

Q191.() Calculate thc refractive index of material whose polarising angle is $60^o$.
(i) Find the polarizing angle for glass of refractive index 1.5.

Q192.The light of wavelength 590 nm, 596 nm are used in turn to study the diffraction taking a single slit of aperture $2 \times 10^{-4}$ m. The distance between the slit and the screen is 1.5 m. Calculate the separation between the positions of first maximum of the diffraction is obtained in the two cases.

Q193.A compound microscope has a magnification of 30. The focal length of eye piece is 5 cm. Assuming the final image to be at least distance of distinct vision, find the magnification produced by the objective.

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Match the following 2 x 1 = 2

Q194.Double refraction

Q195.Prism

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Assertion and reason 2 x 2 = 4

Q196.**Assertion:** Nicol prism is used to produce and analyze plane polarised light.
**Reason:** Nicol prism reduces the intensity of light to zero.
**Codes:**
(a) Assertion and Reason are correct and Reason is the correct explanation of Assertion.
(b) Assertion and Reason are true but Reason is the false explanation of the Assertion.
(c) Assertion is true but Reason is false.
(d) Assertion is false but Reason is true.

Q197.**Assertion:** The unpolarised light and polarised light can be distinguished from each other by using polaroids.
**Reason:** A polaroid is capable of producing plane polarised beams of light.
**Codes:**
(a) Assertion and Reason are correct and Reason is the correct explanation of Assertion.
(b) Assertion and Reason are true but Reason is the false explanation of the Assertion.
(c) Assertion is true but the reason is false.
(d) Assertion is false but Reason is true.

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Choose the correct sentence 1 x 2 = 2

Q198. (I) The fringe width is inversely proportional to the distance between the two slits.
(II) In Young's experiment, the fringe width for dark fringes is different from that for white fringes.
(III) In Young's experiment, the width of each slit is about 0.05 mm.
(IV) In Young's experiment, the double slit $S_1$ and $S_2$ are separated by a distance of about 0.3 mm.
(a) I and II only
(b) I and IV only
(c) I, II and III only
(d) I, II, III and IV