OPTICS

1 MARKS

1. A glass lens of refractive index 1.45 disappears when immersed in a liquid. What is the value of
   refractive index of the liquid?

   CBSE (Delhi)-2010 set1
2. Calculate the speed of light in a medium whose critical angle is 30°.

   CBSE (Delhi)-2010 set3
3. A converging lens is kept co-axially in contact with a diverging lens – both the lenses being of equal focal lengths. What is the focal length of the combination?

   CBSE (All India)-2010 set1
4. When light travels from a rarer to a denser medium, the speed decreases. Does this decrease in
   speed imply a decrease in the energy carried by the light wave? Justify your answer.

   CBSE (All India)-2010 set1
5. Why does the sky appear blue?

   CBSE (Foreign)-2010 set1
6. Under what condition does a biconvex lens of glass having a certain refractive index act as a plane glass sheet when immersed in a liquid?

   CBSE (Delhi)-2012 set1
7. For the same value of angle incidence, the angles of refraction in three media A, B and C are 15°, 25° and 35° respectively. In which medium would the velocity of light be minimum?

   CBSE (All India)-2012 set1

8. How does focal length of a lens change when red light incident on it is replaced by violet light? Give reason for your answer.

CBSE (Foreign)-2012 set1

9. Write the relationship between angle of incidence 'i', angle of prism 'A' and angle of minimum deviation for a triangular prism.

CBSE (Delhi)-2013 set1

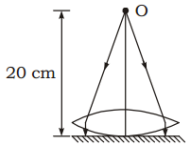
10. Welders wear special goggles or face masks with glass windows to protect their eyes from electromagnetic radiations. Name the radiations and write the range of their frequency.

CBSE (All India)-2013 set1

11. A ray of monochromatic light passes from medium (1) to medium (2). If the angle of incidence in medium (1) is θ and the corresponding angle of refraction in medium (2) is $\theta / 2$, which of the two media is optically denser? Give reason.

CBSE (Foreign)-2013 set1

12. A convex lens is placed in contact with a plane mirror. A point object at a distance of 20 cm on the axis of this combination has its image coinciding with itself. What is the focal length of the lens?



CBSE Board 2013-14

13. A concave lens of refractive index 1.5 is immersed in a medium of refractive index 1.65. What is the nature of the lens?

CBSE Board 2014-15

14. Use the mirror equation to show that an object placed between f and 2f of a concave mirror produces a real image beyond 2f.

OR

Find an expression for intensity of transmitted light when a polaroid sheet is rotated between two crossed polaroids. In which position of the polaroid sheet will the transmitted intensity be maximum?

CBSE Board 2014-15

2 MARKS

1) The radii of curvature of the faces of a double convex lens are 10 cm and 15 cm. If focal length of the lens is 12 cm, find the refractive index of the material of the lens.

CBSE (Delhi)-2010 set1

2) (a) The bluish colour predominates in clear sky.
(b) Violet colour is seen at the bottom of the spectrum when white light is dispersed by a prism. State reason to explain these observations.

CBSE (Delhi)-2010 set1

3) A biconvex lens has a focal length 2/3 times the radius of curvature of either surface. Calculate the refractive index of lens material.

CBSE (Delhi)-2010 set2

4) (i) Why does the Sun appear reddish at sunset or sunrise?
(ii) For which colour the refractive index of prism material is maximum and minimum?

CBSE (Delhi)-2010 set2

5) Find the radius of curvature of the convex surface of a plano-convex lens, whose focal length is 0.3 m and the refractive index of the material of the lens is 1.5.

CBSE (Delhi)-2010 set3

6) (i) Out of blue and red light which is deviated more by a prism? Give reason.
(ii) Give the formula that can be used to determine refractive index of material of a prism in minimum deviation condition.

CBSE (Delhi)-2010 set3

7) Draw a ray diagram to show the formation of the image in a myopic eye. Show with the help of a ray diagram how this defect is corrected.

CBSE (Foreign)-2010 set1

8) Define the resolving power of a microscope. How is this affected when
(i) the wavelength of illuminating radiations is decreased, and
(ii) the diameter of the objective lens is decreased?
Justify your answer.

CBSE (Foreign)-2010 set1

9) Draw a ray diagram to show the formation of the image in a myopic eye. Show with the help of a ray diagram how this defect is corrected.

CBSE (Foreign)-2010 set2

10) Draw a ray diagram to show the formation of the image in a far-sighted (hypermetropic) eye. Show with the help of a ray diagram how this defect is corrected.

CBSE (Foreign)-2010 set3

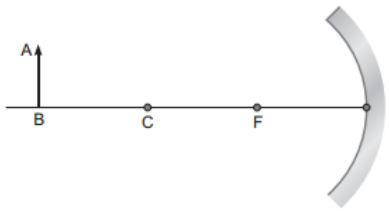
11) Two convex lenses of same focal length but of aperture A1 and A2 (A2 < A1), are used as the objective lenses in two astronomical telescopes having identical eyepieces. What is the ratio of their resolving power? Which telescope will you prefer and why? Give reason.

CBSE (Delhi)-2011 set1

12) A ray of light, incident on an equilateral glass prism ($\mu_g = \sqrt{3}$) moves parallel to the base line of the prism inside it. Find the angle of incidence for this ray.

CBSE (Delhi)-2012 set1

13) An object AB is kept in front of a concave mirror as shown in the figure.



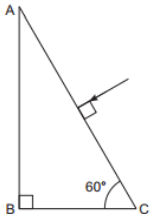
(i) Complete the ray diagram showing the image formation of the object.
(ii) How will the position and intensity of the image be affected if the lower half of the mirror's reflecting surface is painted black?

CBSE (All India)-2012 set1

14) Draw a labelled ray diagram of a reflecting telescope. Mention its two advantages over the refracting telescope.

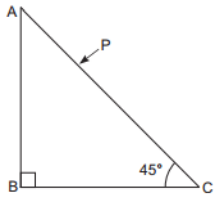
CBSE (All India)-2012 set1

15) Trace the path of a ray of light passing through a glass prism (ABC) as shown in the figure. If the refractive index of glass is 3, find out of the value of the angle of emergence from the prism.



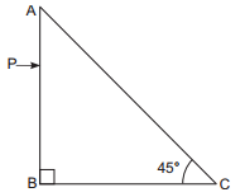
CBSE (Foreign)-2012 set1

16) Trace the path of ray (P) of light passing through the glass prism as shown in the figure. The prism is made of glass with critical angle i_c= 40°.



CBSE (Foreign)-2012 set2

17) A right angle prism is placed as shown in the figure. Given that the prism is made of glass with critical angle 40°, trace the path of the ray P incident normal to the face AC.



CBSE (Foreign)-2012 set3

18) A convex lens of focal length 25 cm is placed coaxially in contact with a concave lens of focal length 20 cm. Determine the power of the combination. Will the system be converging or diverging in nature?

CBSE (Delhi)-2013 set1

19) A convex lens of focal length 20 cm is placed coaxially in contact with a concave lens of focal length 25 cm. Determine the power of the combination. Will the system be converging or diverging in nature?

CBSE (Delhi)-2013 set2

20) A convex lens of focal length 30 cm is placed coaxially in contact with a concave lens of focal length 40 cm. Determine the power of the combination. Will the system be converging or diverging in nature?

CBSE (Delhi)-2013 set3

21) A parallel beam of light of 500 nm falls on a narrow slit and the resulting diffraction pattern is observed on a screen 1 m 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.

CBSE (All India)-2013 set1

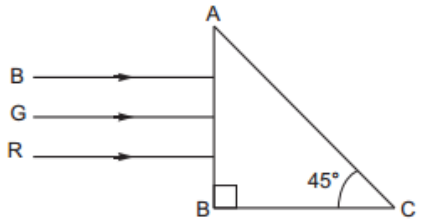
22) A convex lens of focal length f_1 is kept in contact with a concave lens of focal length f_2. Find the focal length of the combination.

CBSE (All India)-2013 set1

23) A parallel beam of light of 600 nm falls on a narrow slit and the resulting diffraction pattern is observed on a screen 1.2 m away. It is observed that the first minimum is at a distance of 3 mm from the centre of the screen. Calculate the width of the slit.

CBSE (All India)-2013 set2

24) Three rays of light, red (R), green (G) and blue (B), are incident on the face AB of a right angled prism, as shown in the figure. The refractive indices of the material of the prism for red, green and blue are 1.39, 1.44 and 1.47 respectively. Which one of the three rays will emerge out of the prism? Give reason to support your answer.



CBSE (Foreign)-2013 set1

25) (a) A giant refracting telescope has an objective lens of focal length 15 m. If an eye piece of focal length 1.0 cm is used, what is the angular magnification of the telescope?

(b) If this telescope is used to view the moon, what is the diameter of the image the moon formed by the objective lens? The diameter of the moon is 3.48×10^6 m and the radius of lunar orbit is 3.8×10^8 m.

CBSE Board 2014-15

3 MARKS

I. What is an unpolarized light? Explain with the help of suitable ray diagram how an unpolarized light can be polarized by reflection from a transparent medium. Write the expression for Brewster angle in terms of the refractive index of denser medium.

CBSE (Delhi)-2010 set1

II. (i) Draw a neat labelled ray diagram of an astronomical telescope in normal adjustment. Explain briefly its working.
(ii) An astronomical telescope uses two lenses of powers 10 D and 1 D. What is its magnifying power in normal adjustment?

OR

(i) Draw a neat labelled ray diagram of a compound microscope. Explain briefly its working.
(ii) Why must both the objective and the eye-piece of a compound microscope have short focal lengths?

CBSE (All India)-2010 set1

III. How does an unpolarised light get polarised when passed through polaroid?
Two polaroids are set in crossed positions. A third polaroid is placed between the two making an angle θ with the pass axis of the first polaroid. Write the expression of the intensity of light transmitted from the second polaroid. In what orientations will the transmitted intensity be
(i) minimum and (ii) maximum?

CBSE (All India)-2010 set1

IV. An illuminated object and a screen are placed 90 cm apart. Determine the focal length and nature of the lens required to produce a clear image on the screen, twice the size of the object

CBSE (All India)-2010 set1

V. The image obtained with a convex lens is erect and its length is four times the length of the object. If the focal length of the lens is 20 cm, calculate the object and image distances.

CBSE (All India)-2010 set2

VI. A convex lens is used to obtain a magnified image of an object on a screen 10 m from the lens. If the magnification is 19, find the focal length of the lens.

CBSE (All India)-2010 set3

VII. A parallel beam of monochromatic light of wavelength 500 nm falls normally on a narrow slit and the resulting diffraction pattern is obatined on a screen 1 m away. It is observed that the first minimum is at a distance of 2.5 mm from the centre of the screen. Find

(a) the width of the slit.

(b) the distance of the second maximum from the centre of the screen.

(c) the width of the central maximum.

OR

A beam of light consisting of two wavelengths, 650 nm and 520 nm, is used to obtain interference fringes in a Young's double slit experiment. What is the least distance from the central maximum where the bright fringes due to the both the wavelengths coincide? The distance between the slits is 2 mm and the distance between the plane of the slits and screen is 120 cm.

CBSE (Foreign)-2010 set1

VIII. (a) How is the focal length of a spherical mirror affected when the wavelength of the light used is increased?

(b) A convex lens has 20 cm focal length in air. What is its focal length in water? (Refractive index of air-water = 1.33, refractive index of air-glass =1.5).

CBSE (Foreign)-2010 set1

IX. Draw a schematic diagram of a reflecting telescope (Cassegrain). Write two important advantages that the reflecting telescope has over a refracting type.

CBSE (Foreign)-2010 set1

X. (a) How is the focal length of a spherical mirror affected when it is immersed in water.

(b) A convex lens has 10 cm focal length in air. What is its focal length in water? (Refractive index of air-water = 1.33, refractive index of air-glass =1.5).

CBSE (Foreign)-2010 set2

XI. Describe Young's double slit experiment to produce interference pattern due to a monochromatic source of light. Deduce the expression for the fringe width.

OR

Use Huygen's principle to verify the laws of refraction.

CBSE (Delhi)-2011 set1

XII. A convex lens made up of glass of refractive index 1.5 is dipped, in turn, in (i) a medium of refractive index 1.65, (ii) a medium of refractive index 1.33.
(a) Will it behave as a converging or a diverging lens in the two cases?
(b) How will its focal length change in the two media?

CBSE (All India)-2011 set1

XIII. Use the mirror equation to show that
(a) an object placed between f and 2f of a concave mirror produces a real image beyond 2f.
(b) a convex mirror always produces a virtual image independent of the location of the object.
(c) an object placed between the pole and focus of a concave mirror produces a virtual and enlarged image.

CBSE (All India)-2011 set1

XIV. A compound microscope uses an objective lens of focal length 4 cm and eyepiece lens of focal length 10 cm. An object is placed at 6 cm from the objective lens. Calculate the magnifying power of the compound microscope. Also calculate the length of the microscope.

OR

A giant refracting telescope at an observatory has an objective lens of focal length 15 m. If an eyepiece lens of focal length 1.0 cm is used, find the angular magnification of the telescope. If this telescope is used to view the moon, what is the diameter of the image of the moon formed by the

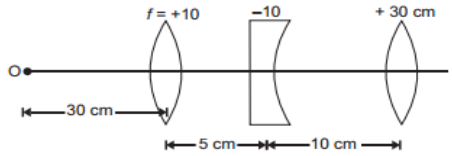
objective lens? The diameter of the moon is 3.42×10^6 m and the radius of the lunar orbit is 3.8×10^8 m.

CBSE (All India)-2011 set1

XV. A converging lens has a focal length of 20 cm in air. It is made of a material of refractive index 1.6. It is immersed in a liquid of refractive index 1.3. Calculate its new focal length.

CBSE (All India)-2011 set3

XVI. Find the position of the image formed of the object 'O' by the lens combination given in the figure.



CBSE (Foreign)-2011 set1

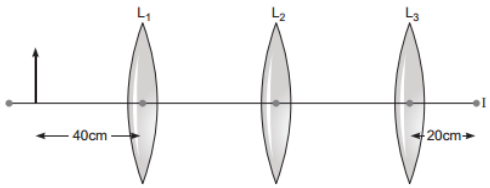
XVII. Light of wavelength 2500 Å falls on a metal surface of work function 3.5 V. What is the kinetic energy (in eV) of (i) the fastest and (ii) the slowest electronic emitted from the surface? If the same light falls on another surface of work function 5.5 eV, what will be the energy of emitted electrons?

CBSE (Foreign)-2011 set2

XVIII. Use Huygen's principle to explain the formation of diffraction pattern due to a single slit illuminated by a monochromatic source of light. When the width of slit is made double the original width, how this affect the size and intensity of the central diffraction band?

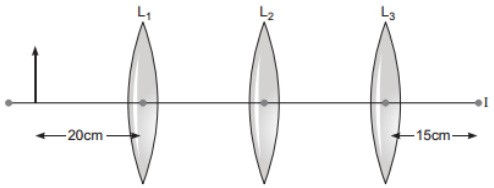
CBSE (Delhi)-2012 set1

XIX. You are given three lenses L1, L2 and L3 each of focal length 20 cm. An object is kept at 40 cm in front of L1, as shown. The final real image is formed at the focus 'I' of L3. Find the separations between L1, L2 and L3.



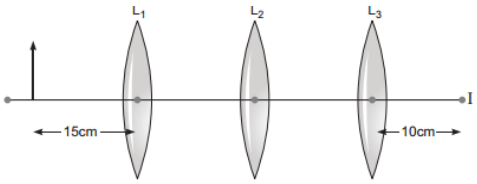
CBSE (All India)-2012 set1

XX. You are given three lenses L1, L2 and L3 each of focal length 15 cm. An object is kept at 20 cm in front of L1, as shown. The final real image is formed at the focus 'I' of L3. Find the separations between L1, L2 and L3.



CBSE (All India)-2012 set2

XXI. You are given three lenses L1, L2 and L3 each of focal length 10 cm. An object is kept at 15 cm in front of L1, as shown. The final real image is formed at the focus 'I' of L3. Find the separations between L1, L2 and L3.



CBSE (All India)-2012 set3

XXII. Define power of a lens. Write its units. Deduce the relation $\frac{1}{f} = \frac{1}{f_1} + \frac{1}{f_2}$ for two thin lenses kept in contact coaxially.

CBSE (Foreign)-2012 set1

XXIII. Define a wavelength.Use Huygens' geometrical construction to show the propagation of a plane wavefront from a rarer medium (i) to a denser medium (ii) undergoing refraction.Hence derive Snell's law of refraction.

OR

(a) Use Huygens' geometrical construction to show the behaviour of a plane wavefront.

(i) passing through a biconvex lens;

(ii) reflecting by a concave mirror.

(b) When monochromatic light is incident on a surface separating two media, why does the

refracted light have the same frequency as that of the incident light?

CBSE (Foreign)-2012 set1

XXIV. (a) Draw a ray diagram showing the image formation by a compound microscope. Hence obtain expression for total magnification when the image is formed at infinity.

(b) Distinguish between myopia and hypermetropia. Show diagrammatically how these defects can be corrected.

OR

(a) State Huygen's principle. Using this principle draw a diagram to show how a plane wave front incident at the interface of the two media gets refracted when it propagates from a rarer to a denser medium. Hence verify Snell's law of refraction.

(b) When monochromatic light travels from a rarer to a denser medium, explain the following, giving reasons:

(i) Is the frequency of reflected and refracted light same as the frequency of incident light?

(ii) Does the decrease in speed imply a reduction in the energy carried by light wave?

CBSE (Delhi)-2013 set1

XXV. (a) Write two characteristic features distinguishing the diffraction pattern from the interference fringes obtained in Young's double slit experiment.

(b) Two wavelengths of sodium light 590 nm and 596 nm are used, in turn, to study the diffraction taking place due to a single slit of aperture 1×10^{-4} m. The distance between the slit and the screen is 1.8 m. Calculate the separation between the positions of the first maxima of the diffraction pattern obtained in the two cases.

CBSE (Delhi)-2013 set3

XXVI. Draw a labeled ray diagram of a refracting telescope. Define its magnifying power and write the expression for it. Write two important limitations of a refracting telescope over a reflecting type telescope.

CBSE (All India)-2013 set1

XXVII. (a) What is linearly polarized light? Describe briefly using a diagram how sunlight is polarised.

(b) Unpolarised light is incident on a polaroid. How would the intensity of transmitted light change when the polaroid is rotated?

CBSE (All India)-2013 set1

XXVIII. (i) Draw a schematic labelled ray diagram of a reflecting type telescope.
(ii) Write two important advantages justifying why reflecting type telescopes are preferred over refracting telescopes.
(iii) The objective of a telescope is of larger focal length and of larger aperture (compared to the eyepiece). Why? Give reasons.

CBSE (Foreign)-2013 set1

XXIX. When unpolarised light is incident on the boundary separating the two transparent media, explain, with the help of a suitable diagram, the conditions under which the reflected light gets polarised. Hence define Brewster's angle and write its relationship in terms of the relative refractive index of the two media.

CBSE (Foreign)-2013 set1

XXX. (a) Draw a labelled ray diagram of a compound microscope.
(b) Derive an expression for its magnifying power.
(c) Why is objective of a microscope of short aperture and short focal length? Give reason.

CBSE (Foreign)-2013 set2

XXXI. (a) Draw a labelled ray diagram of a refraction type telescope in normal adjustment.
(b) Give its two shortcomings over reflection type telescope.
(c) Why is eyepiece of a telescope of short focal length, while objective is of large focal length? Explain.

CBSE (Foreign)-2013 set3

XXXII. (a) Draw a labelled ray diagram showing the formation of a final image by a compound microscope at least distance of distinct vision.
(b) The total magnification produced by a compound microscope is 20. The magnification produced by the eye piece is 5. The microscope is focussed on a certain object. The distance between the objective and eyepiece is observed to be 14 cm. If least distance of distinct vision is 20 cm, calculate the focal length of the objective and the eye piece.

CBSE Board 2013-14

XXXIII. (a) A mobile phone lies along the principal axis of a concave mirror. Show, with the help of a suitable diagram, the formation of its image. Explain why magnification is not uniform.

(b) Suppose the lower half of the concave mirror's reflecting surface is covered with an opaque material. What effect this will have on the image of the object ? Explain.

CBSE Board 2013-14

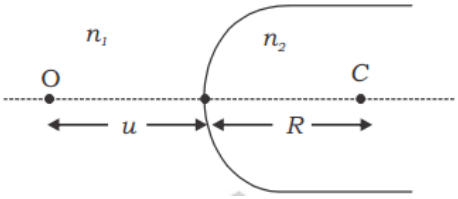
XXXIV. (a) Using Huygen's construction of secondary wavelets explain how a diffraction pattern is obtained on a screen due to a narrow slit on which a monochromatic beam of light is incident normally.

(b) Show that the angular width of the first diffraction fringe is half that of the central fringe.

(c) Explain why the maxima at $\theta = \left(n + \frac{1}{2}\right)\frac{\lambda}{a}$ become weaker and weaker with increasing n.

OR

(a) A point object 'O' is kept in a medium of refractive index n_1 in front of a convex spherical surface of radius of curvature R which separates the second medium of refractive index n_2 from the first one, as shown in the figure. Draw the ray diagram showing the image formation and deduce the relationship between the object distance and the image distance in terms of n_1, n_2 and R.



(b) When the image formed above acts as a virtual object for a concave spherical surface separating the medium n_2 from n_1 ($n_2 > n_1$), draw this ray diagram and write the similar (similar to (a)) relation. Hence obtain the expression for the lens maker's formula.

CBSE Board 2014-15

5 MARKS

i. State Huygen's principle. Show, with the help of a suitable diagram, how this principle is used to obtain the diffraction pattern by a single slit. Draw a plot of intensity distribution and explain clearly why the secondary maxima become weaker with increasing order (n) of the secondary maxima.

OR

Draw a ray diagram to show the working of a compound microscope. Deduce an expression for the total magnification when the final image is formed at the near point. In a compound microscope, an object is placed at a distance of 1×5 cm from the objective of focal length 1×25 cm. If the eye piece has a focal length of 5 cm and the final image is formed at the near point, estimate the magnifying power of the microscope.

CBSE (Delhi)-2010 set1

ii. (a) Draw a ray diagram to show refraction of a ray of monochromatic light passing through a glass prism.
Deduce the expression for the refractive index of glass in terms of angle of prism and angle of minimum deviation
(b) Explain briefly how the phenomenon of total internal reflection is used in fibre optics.

OR

(a) Obtain lens makers formula using the expression

$$\frac{n_2}{v} - \frac{n_1}{v} = \frac{(n^2 - n^1)}{R}$$

Here the ray of light propagating from a rarer medium of refractive index (n1) to a denser medium of refractive index (n2), is incident on the convex side of spherical refracting surface of radius of curvature R.

(b) Draw a ray diagram to show the image formation by a concave mirror when the object is kept between its focus and the pole. Using this diagram, derive the magnification formula for the image formed.

CBSE (Delhi)-2011 set1

iii. State the importance of coherent sources in the phenomenon of interference.

In Young's double slit experiment to produce interference pattern, obtain the conditions for constructive and destructive interference. Hence, deduce the expression for the fringe width. How does the fringe width get affected, if the entire experimental apparatus of Young is immersed in water?

OR

(a) State Huygen's principle. Using this principle explain how a diffraction pattern is obtained on
a screen due to a narrow slit on which a narrow beam coming from a monochromatic source
of light is incident normally.

(b) Show that the angular width of the first diffraction fringe is half of that of the central fringe.

(c) If a monochromatic source of light is replaced by white light, what change would you
observe in the diffraction pattern?

CBSE (All India)-2011 set1

iv. (i) A plane wavefront approaches a plane surface separating two media. If medium 'one' is optically denser and medium 'two' is optically rarer, using Huygens' principle, explain and show how a refracted wavefront is constructed.

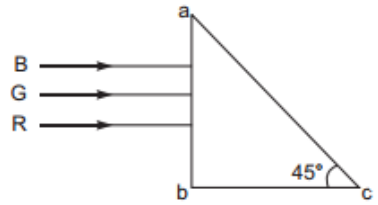
(ii) Hence verify Snell's law.

(iii) When a light wave travels from rarer to denser medium, the speed decreases. Does it imply reduction its energy? Explain.

OR

(i) A ray of monochromatic light is incident on one of the faces of an equilateral triangular prism
of refracting angle A. Trace the path of ray passing through the prism. Hence, derive an
expression for the refractive index of the material of the prism in terms of the angle minimum
deviation and its refracting angle.

(ii) Three light rays red (R), green (G) and blue (B) are incident on the right angled prism abc at face ab. The refractive indices of the material of the prism for red, green and blue wavelengths are respectively 1.39, 1.44 and 1.47. Trace the paths of these rays reasoning out the difference in their behavior.



CBSE (Foreign)-2011 set1

v. Define magnifying power of a telescope. Write its expression. A small telescope has an objective lens of focal length 150 cm and an eye piece of focal length 5 cm. If this telescope is used to view a 100 m high tower 3 km away, find the height of the final image when it is formed 25 cm away from the eye piece.

OR

How is the working of a telescope different from that of a microscope? The focal lengths of the objective and eyepiece of a microscope are 1.25 cm and 5 cm respectively. Find the position of the object relative to the objective in order to obtain an angular magnification of 30 in normal adjustment.

CBSE (Delhi)-2012 set1

vi. (a) In Young's double slit experiment, derive the condition for :

(i) constructive interference and

(ii) destructive interference at a point on the screen.

(b) A beam of light consisting of two wavelengths, 800 nm and 600 nm is used to obtain the interference fringes in a Young's double slit experiment on a screen placed 1.4 m away. If the two slits are separated by 0.28 mm, calculate the least distance from the central bright maximum where the bright fringes of the two wavelengths coincide.

OR

(a) How does an unpolarized light incident on a Polaroid get polarized?

Describe briefly, with the help of a necessary diagram, the polarisation of light by reflection from a transparent medium.

(b) Two polaroids 'A' and 'B' are kept in crossed position. How should a third polaroid 'C' be placed between them so that the intensity of polarised light transmitted by polaroid B reduces to 1/8th of the intensity of unpolarised light incident on A?

CBSE (All India)-2012 set1

vii. (a) A monochromatic source of light of wavelength λ illuminates a narrow slit of width d to produce a diffraction pattern on the screen. Obtain the conditions when secondary wavelets originating from the slit interfere to produce maxima and minima on the screen.

(b) How would the diffraction pattern be affected when

(i) the width of the slit is decreased?

(ii) the monochromatic source of light is replaced by white light?

OR

A thin convex lens having two surfaces of radii of curvature R_1 and R_2 is made of a material of refractive index μ_2. It is kept in a medium of refractive index μ_1. Derive, with the help of a ray diagram, the lens maker formula when a point object placed on the principal axis in front of the radius of curvature R_1 produces an image I on the other side of the lens.

CBSE (Foreign)-2013 set1

viii. (a)(i) 'Two independent monochromatic sources of light cannot produce a sustained interference pattern'. Give reason.

(ii) Light waves each of amplitude "a" and frequency "ω", emanating from two coherent light sources superpose at a point. If the displacements due to these waves is given by y1 = a cos ωt and y2 = a cos(ωt + Ø) where Ø is the phase difference between the two, obtain the expression for the resultant intensity at the point.

(b)In Young's double slit experiment, using monochromatic light of wavelength λ, the intensity of light at a point on the screen where path

difference is λ , is K units. Find out the intensity of light at a point where path difference is λ /3.

OR

(a) How does one demonstrate, using a suitable diagram, that unpolarised light when passed through a Polaroid gets polarised ?

(b) A beam of unpolarised light is incident on a glass-air interface. Show, using a suitable ray diagram, that light reflected from the interface is totally polarised, when μ = tan i_B, where μ is the refractive index of glass with respect to air and i_B is the Brewster's angle.

CBSE Board 2013-14