PHYSICS

BOOKS - TARGET PHYSICS (HINGLISH)

RAY OPTICS

Classical Thinking

1. Light travels as a

A. electromagnetic radiation

B. longitudinal waves

C. microwaves radiation

D. stationary waves

Answer: A

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2. दृश्य प्रकाश की तरंग-दैधर्य की परास है-

A. 0 to 1000 Å

B. 1000 to 3000 Å

C. 4000 to 7500 Å

D. 8000 to 9500 Å

Answer: C

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3. The study of light without considering diffraction is called _____

A. optics

B. ray optics

C. refraction

D. polarisation

Answer: B

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4. Ray optics is valid when characteristic dimensions are

A. much smaller than the wavelenght of light.

B. much larger that be wavelenght of light.

C. of the same order as that of wavelenght of light.

D. of the order of milimetre.

Answer: B

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5. The bending of light about corners of an obstacle is called

A. dispersion

B. diffraction

C. reflection

D. polarisation

Answer: B

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6. Light from a point source travel in a straight line with a very high speed hence

A. cast off a sharp shadow of an opaque object.

B. reflected from a rough surface.

C. abosrbed in the medium.

D. deviated when incident on an opaque object.

Answer: A

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7. Choose the CORRECt statement.

A. The laws of refraction are valid for spherical mirros.

B. The law of polarisation is valid for spherical mirros.

C. the laws of reflection are valid for any reflecting surface.

D. The laws of relfection are not valid for spherica mirrors.

Answer: C

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8. The geometrical centre of surface of spherical mirror is called its _____

A. centre of curvature

B. focus

C. pole

D. optical centre

Answer: C

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9. The principle axis of spherical mirror passes through _____

A. pole and centre of curvature

B. centre of curvature only

C. focus only

D. pole only

Answer: A

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10. A ray of light falls on a mirror normally. What are the values of angle of incedence and the angle of reflection.

A. $i = 0^\circ, r = 90^\circ$

B. $i = 90^\circ, r = 0^\circ$

C. $i = 90^\circ, r = 90^\circ$

D. $i = 0^\circ, r = 0^\circ$

Answer: D

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

A. $f = \frac{R}{2}$

B. $R = \frac{f}{2}$

C. $fR = 2$

D. $f = \frac{1}{R}$

Answer: A

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12. An object is at a distance of 10 cm from a concave mirror and the image of the object is at a distance of 30 cm from the mirror on the same side as that of the object. The radius of curvature of the concave mirror is

A. $+15.0$ cm

B. $+7.5$ cm

C. -7.5 cm

D. -15.0 cm

Answer: D

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13. Given a point source of light, which of the following can produce a divergent beam of light ?

A. convex mirror

B. convex lens

C. concave mirror

D. a plane mirror

Answer: A

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14. When does a concave mirror form a virtual image ?

A. beyond C

B. at C

C. between C and F

D. between F and pole

Answer: D

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15. For concave mirror, if the object is at the focusn f, the image is

A. real and at focus,

B. virtual and at radius of curvature.

C. real and iomperceptiable.

D. virtal and at infinity (imperceptible)

Answer: D

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16. A virtual image larger than the object can be obtained by

A. a concanve lens

B. a plane mirror

C. a convex mirrora

D. concave mirror

Answer: D

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17. In an experiment to find the focal lengh of a concave mirror, an object is palced at a distance of 40 cm from it and forms image at 24 cm from the mirror, ten the focal length is

A. -15 cm

B. -16 cm

C. -30 cm

D. -32 cm

Answer: A

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18. After reflection, the paralle beam of light appears to come from a point then the type of mirror is _____

A. concanve

B. plane

C. convex

D. plano-convex

Answer: C

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19. Which spherical mirror is divergent ?

A. Convex

B. Concave

C. Plane

D. Concave plane

Answer: A

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20. A real object is placed at a distance f from the pole of a convex mirror, infront of the convex mirror. If focal length of the mirror is f,

then distance of the image from the pole of the mirror is

A. less than f

B. equal to f

C. more than f

D. infinity

Answer: A

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21. The firld of view is maximum for

A. plane mirror

B. concave mirror

C. convex mirror

D. parabolic mirror

Answer: C

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22. A virtual object placed between the pole and principle focus of a convex mirror produce and image which is

A. real, magnified and erect.

B. virtual, diminished and inverted.

C. virtual, maginified and inverted.

D. real, diminshed and invrted.

Answer: A

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23. A convex mirror may be used for all but it can NOT be used for _____

A. a magnifying mirror

B. a reflecting mirror

C. a dentist mirror

D. a carving mirror

Answer: D

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24. A convex mirror gives an images which is

A. real and inverted.

B. virtual and inverted.

C. virtual and magnified.

D. virtual and diminished.

Answer: D

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25. A $4.5cm$ needle is placed 12 cm away from a convex mirror of focal length 15 cm. Give the location of the image and the magnification. Describe what happens as the needle is moved farther from the mirror.

A. $+4.5cm$

B. $+6.7$cm

C. -4.5 cm

D. -6.7 cm

Answer: B

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26. An object is placed at a distance of 25 cm from a spherical mirror, its image is formed behing the mirror at a distance of 5 cm. The focal length and type mirror is

A. $+6.25$ cm, concave

B. -6.25 cm, concave

C. $+6.25$ convex

D. -6.25 cm, convex

Answer: C

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27. According to new Cartesian sign convention, all the distane are measured from _____

A. object

B. image

C. optical centre

D. lens

Answer: C

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28. According to new Cartesian sign convention, all distance measured

A. to the left of the pole of the mirror or optical centre of a lens are regarded as negative.

B. to the left of the pole of the mirror or optical centre of a lens are regarded as positive.

C. vertically upwards are negative

D. vertically donwwards are positive

Answer: A

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29. While deriving expression for refraction at single curved, surface, the object is ocnidered as

A. linear object

B. thick object

C. point object

D. any size object

Answer: C

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30. The correct expression for refraction at single convex spherical surface separating two media of refractiv eindices μ_1 and $\mu_2(\mu_2 > \mu_1)$ and radius of curvature R is (u and v are object, image distane respectively)

A. $\frac{\mu_1}{u} - \frac{\mu_2}{v} = \frac{(\mu_1 - \mu_2)}{R}$

B. $\frac{\mu_1}{v} - \frac{\mu_2}{u} = \frac{(\mu_1 - \mu_2)}{R}$

C. $\frac{\mu_2}{u} - \frac{\mu_1}{v} = \frac{(\mu_2 - \mu_1)}{R}$

D. $\frac{\mu_2}{v} - \frac{\mu_1}{u} = \frac{(\mu_2 - \mu_1)}{R}$

Answer: D

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31. A point object is situated in air at a distance of 20 cm from a convex refracting surface of 5cm radius. The position of the iamge is $[\mu = 1.5]$

A. 40 cm

B. 30 cm

C. 25 cm

D. 15 cm

Answer: B

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32. The focal length of a lens depends on

A. radii of curvatures of two suface only.

B. refaractive index of the lens material only.

C. length of the lense.

D. both radii of curvature of two surfaces and refractive index of the lens material.

Answer: D

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33. The lense formula with normal notation is given by

A. $\frac{1}{v} - \frac{1}{u} = \frac{1}{f}$

B. $\frac{1}{u} - \frac{1}{v} = \frac{1}{f}$

C. $\frac{1}{u} - \frac{1}{f} = \frac{1}{v}$

D. $\frac{1}{v} + \frac{1}{f} = \frac{1}{u}$

Answer: A

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34. The lens maker's equation is given by

A. $\frac{1}{f} = \left(\frac{\mu_1}{\mu_2} - 1\right)\left(\frac{1}{R_1} + \frac{1}{R_2}\right)$

B. $\frac{1}{f} = \left(\frac{\mu_2}{\mu_1} - 1\right)\left(\frac{1}{R_1} + \frac{1}{R_2}\right)$

C. $\frac{1}{f} = \left(\frac{\mu_2}{\mu_1} - 1\right)\left(\frac{1}{R_1} - \frac{1}{R_2}\right)$

D. $\frac{1}{f} = \left(\frac{\mu_1}{\mu_2} - 1\right)\left(\frac{1}{R_1} - \frac{1}{R_2}\right)$

Answer: C

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35. For convex lens, the radii of curvatures of the first and second surface are R_1 and R_2 respectively. Using new Cartesian sign conventions they are

A. $-R_1, \ -R_2$

B. $-R_1, +R_2$

C. $+R_1, +R_2$

D. $+R_1, -R_2$

Answer: D

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36. A parallel beam of light is incident on a converging lens parallel to its principal axis. As one moves away from the les on the other side on its principal axis, the intensity of light

A. contiunously decreases.

B. first decreases sand then increases

C. continuously increases.

D. first increases and then decreases.

Answer: D

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37. An object is kept at 0.2m from a convex lens of focal length 0.15 m. Find the position of the image produced.

A. 0.3 m

B. 0.6 m

C. 8 m

D. $11.6m$

Answer: B

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38. A convex lens of focal length f produces a real image 3 times as that of size of the object,

the distance between the object and the lens is

A. $-\left(\frac{2f}{3}\right)$

B. $-\left(\frac{3f}{4}\right)$

C. $-\left(\frac{4f}{3}\right)$

D. $-\left(\frac{3f}{2}\right)$

Answer: C

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39. when an object is kept in frnt of a convex lens the distance between it and the real image is 54 cm. if the magnification produced is 2, the focal length of the lens is

A. 4 cm

B. 6 cm

C. 12 cm

D. 24 cm

Answer: C

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40. What is the focal length of double convex lens for which radius of curvature of either of the surfaces is 30 cm? $\left[{}_a\mu_g = 1.5\right]$

A. 50 cm

B. 30 cm

C. $-30cm$

D. $-50cm$

Answer: B

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41. A plano-convex lens has focal length of 20 cm. the radius of its spherical suface is $\left({}_a\mu_g = 1.5\right)$

A. 20 cm

B. 15 cm

C. 10 cm

D. $7.5cm$

Answer: C

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42. The focal length of concave lens, accroding to new Cartesiaon sign conventions is

A. negative.

B. positive

C. canbe negative only for object kept between optical centre and focus.

D. can be positive only for object kept between optical centre and focus.

Answer: A

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43. A diverging lens may NOT have _____

A. positive focal length

B. negative focal length

C. one plane length

D. one convex surface

Answer: A

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44. A concave lens of focal length f produces an image $\frac{1}{4}$ of the size of the object, the object should be kept at ___ from the lens.

A. 2 f

B. 3 f

C. 4 f

D. 5 f

Answer: B

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45. A concave lens has radioi of curvatures of 20 cm and 30 cm respectively. If the refrative index of the material of lens is 1.6 it focal length is given by

A. -30 cm

B. $-25cm$

C. $-20cm$

D. $-10cm$

Answer: C

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46. The radius of curvature of each surface of a biconcave lens made up of glass of refrative indx 1.5 is 30 cm. the focal length of the lens is

A. 60 cm

B. 30 cm

C. $-30cm$

D. $-60cm$

Answer: C

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47. If the object is placed at A and the image is formed at B when the rays are refracted through a convex lens. The position. Of A and B are changeable. Such pair of is called.

A. pair of focal points.

B. pair of object and focal points.

C. conjugate foci.

D. pair of foci.

Answer: C

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48. A single lens, which will form the image of a given object at the same point as it formed by the combination of twoor more thin lenses, is calles as _____

A. equivalent lens

B. added lens

C. concave -convex lens

D. convexo-concave lens

Answer: A

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49. Two thin lenses may be combined so as to

A. produce diminished image.

B. produce maginifed image.

C. produce magnified image.

D. cancel image and no image is formed.

Answer: B

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50. Two thin lenses of focal lengths f_1 and f_2 are in contact. The focal length of this combination is

A. $f = f_1 + f_2$

B. $\frac{1}{f} = \frac{1}{f_1} + \frac{1}{f_2}$

C. $f = \frac{f_1}{f_2}$

D. $f = \frac{f_2}{f_1}$

Answer: B

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51. Two thin converging lenses of focal length 15 cm and 30 cm are held in contact with each other. The focal length of the combination is

A. 45 cm

B. 15 cm

C. 10 cm

D. 9 cm

Answer: C

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52. What is the focal length of a convex lens of focal length $30cm$ in contact with a concave lens of focal length $20cm$. Is the system a

converging or a diverging lens ? Ignore thickness of the lenses.

A. 30 cm

B. 10 cm

C. $-20cm$

D. $-60cm$

Answer: D

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53. Two thin lenses, aone convex of focal length 10 cm and other concave lens are kept in contact to form a composite lens of focal length 13 cm . If the combination acts as a converging lense the focal length of second lens is

A. -43.33 cm

B. $-6.65cm$

C. $+5.65cm$

D. $+43.33cm$

Answer: A

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54. The least distance of distinct vision for a young adult with normal vision is about :

A. 25 m

B. $2.5m$

C. $25m$

D. $2.5m$

Answer: C

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55. A norml eye is unable to see objects at a distance less than distance of distinct vision. If is because

A. the focal length of the eye-lense is equal to the distance of distinct vision

B. the distance between eye-lense and retina is equal to distance of distinct

vision.

C. the eye-lens cannot decreases its focal length beyond a limit .

D. the eye-lense cannot decreases its distance from the retina beyond a limit.

Answer: C

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56. The clearity of image formed on retina of eye depends on the _____

A. visual angle

B. environmental condition

C. distance of eye-lense from retina

D. material of the object whose imae is observed

Answer: A

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57. A convex lense of the short focal length held very close to the eye, to obseved minute objects clearly is called as _____

A. compound microscope

B. telescope

C. simple microscoe

D. special effect camaera

Answer: C

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58. The magnifying power of simple microscope is

A. directly proportional to its focal length .

B. directly proportional to object distnace.

C. inversely proportional to square of its focal length.

D. inversely proportional to its length

Answer: D

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59. A person using a lens as a simple microscope sees an

A. inverted virtual image

B. inveted real image

C. upright virtual image

D. upright real magnified image

Answer: C

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60. The magnifying power of simple microscope, when iamge is forme at DDV, is (where f is its focal lengths of)

A. $\frac{D}{f}$

B. $\frac{f}{D}$

C. $\left(1+\frac{D}{f}\right)$

D. $\left(1-\frac{D}{f}\right)$

Answer: C

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61. In a simple microscope, if the final image is located at infinity then its magnifying power is

A. $\frac{f}{D}$

B. $\frac{D}{f}$

C. $\frac{L}{f_o}, \frac{D}{f_o}$

D. $\left(D + \frac{1}{f}\right)$

Answer: B

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62. The magnifiying power of simple microscope is maximum when image is formed at _____

A. infinity

B. focus

C. twice the focus

D. D.D.V.

Answer: D

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63. When a convex lens of 2.5 cm focal length is used as a magnifying glass, norma eye can see an object clearly at a distance of 25 cm. The magnifying power of the instrument is

A. 110

B. 100

C. 11

D. 10

Answer: C

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64. The compound microscopae is used to see

A. large object at infinity.

B. small objects at infinity.

C. large objects near objective

D. small objects near objective

Answer: D

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65. Compound microscope is NOT used in

A. travelling microscope in physics laboratry.

B. patholyg laboratories.

C. science to study details of plant tissues.

D. watch reparing industry.

Answer: D

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66. The focal length of the eye-piece of compound microscope is

A. greater than the focal of object.

B. less than the focal length of objective.

C. equal to focal length of the objvective.

D. arbitrary

Answer: A

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67. The length (L) of compound microscope when final image is formed at D.D.V. is given by

A. $(v_o + u_e)$

B. $(v_o - u_e)$

C. $(u_o + v_o)$

D. $(u_o - v_o)$

Answer: A

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68. When the final image is formed at infinity the magnifying power of compound microscope is (using new Cartesian sign conventions)

A. $-\left(\frac{v_o}{u_o}\right)\left(\frac{D}{f_e}+1\right)$

B. $-\left(\frac{v_o}{u_o}\right)\left(\frac{D}{f_e}\right)$

C. $-\left(\frac{u_o}{v_o}\right)\left(\frac{D}{f_e}-1\right)$

D. $-\left(\frac{u_o}{v_o}\right)\left(\frac{D}{f_e}\right)$

Answer: B

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69. Which of the following is NOT an expression for magnifying power of compound microscop when final image is fomed at distace of distinct vison ? (using new Cartesian sign conventions)

A. $-\left(\frac{v_o}{u_o}\right)\left(\frac{D}{u_e}\right)$

B. $-\left(\frac{v_o}{u_o}\right)\left(\frac{D}{u_e}+1\right)$

C. $-\left(\frac{f_o}{u_o-f_o}\right)\left(1+\frac{D}{f_e}\right)$

D. $-\left(\frac{f_o}{u_o-f_o}\right)\left(\frac{D}{f_e}\right)$

Answer: D

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70. A compound microscope has a magnifying power of 35. Assume that the final image is formed at DDV (25 cm). If the focal length of eyepiece is 8 cm, the magnification produced by objective is

A. 1.3

B. 8.48

C. 14.12

D. 12.84

Answer: B

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71. The object which are at large distancve as compared to the focal length of lens (greather thaan $10 \times f$) are referred as _____

A. decade objects

B. nearer objects

C. distant objects

D. unpredictable objects

Answer: C

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72. The object of astronomical telescope has

A. large aperture and large focal length

B. small apetture and small focal length

C. small of aperture and larger focal length

.

D. large aperture and small focal length

Answer: A

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73. In astronomcial telescop, which of the following statement is NOT applicable ?

A. The telescope is light weight.

B. The telescope is very heavy and bulky

C. The telescope suffers spherical aberration.

D. The telescope suffers chromatic aberration.

Answer: A

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74. The intermediate image fomred by the objective is

A. in the focus plane of objetive.

B. within the focus of objective

C. beyond the focus of eye- piece.

D. at twice the distance of focal length of eye-piece.

Answer: A

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75. To see terrestiral objects, the final image must be _____

A. inverted and magnified

B. diminished, invertedand magnified

C. real, ereect and diminished

D. virtual, erect and magnified

Answer: D

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76. Whan a _____ is introduced between objective and eye piece of telescope then it can be used as a terrestrial telescope.

A. concave lens

B. concave mirror

C. convex lens

D. convex mirror

Answer: C

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77. When as tronomical telescope is adjusted for normal adjustment the finla image is formed at

A. infinity

B. D.D.V. from eye piece.

C. D.D.V from objective

D. focus of eye-piece.

Answer: A

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78. The length (L) of the astronomical telescope, for normal adjustment is

A. $\left(\frac{f_o + f_e}{2}\right)$

B. $\left(\frac{f_o - f_e}{2}\right)$

C. $f_o \times f_e$

D. $(f_o \times f_e)$

Answer: D

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79. The focal length of objecive and eye-piece of astronomical telescope are 2 m and 5 cm respectively. The magnifying power of telescop when final image is formed at infinity is

A. -40

B. -50

C. -80

D. -100

Answer: A

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80. Magnifying power of an astronomical telescope is M.P. If the focal length of the eye-piece is doubled, then its magnifying power will become

A. $\frac{M.P}{2}$

B. $\sqrt{2}M.P$

C. $2M.P$

D. $3M.P$

Answer: A

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81. An astronomical telescope of ten-fold angular magnification has a length of $44cm$. The focal length of the objective is

A. 4 cm

B. 40 cm

C. 44 cm

D. 440 cm

Answer: B

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82. The objective of relfecting telescope is

A. small concave mirror.

B. small concave parabolic mirror

C. large concave parabolic mirro.

D. convex mirror

Answer: C

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83. A _____ is fixed at focal point of the objective, which reflects the collected rays to eyepice.

A. small convex mirror

B. small concave mirror

C. small convex lens

D. large cocave lens

Answer: A

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84. Out of the following optical instruments which one is independent of chronic and spherical aberrations ?

A. terrestrial telescope

B. astronomical telescope

C. Cassegrain telescope

D. Gallilean telescope

Answer: C

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85. Two thin lenses power $+15D$ and $-5D$ are cobined together. Their equilavlent focal length is

A. 10 cm

B. 12.5 cm

C. 16.6 cm

D. $8.33cm$

Answer: A

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86. An optical instrument , in general, extends our range of vision by

A. making the incident rays, substend a smaller angle at the eye.

B. making the incident rays, substend a larger angle at the eye.

C. producing inverted image.

D. producing real image.

Answer: B

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87. For observing fainter distance objects and for high resolving power which of the following telescope should be used ?

A. refracting telescope

B. terrestrial telescope

C. astronomical telescope

D. reflecting telescope

Answer: D

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88. The reciprocalof $\left(\frac{\mu_2 - \mu_1}{R}\right)$ gives the value of

A. focal length of curved surface.

B. power of surface.

C. refractvie index of surface.

D. radius of curvature of surface.

Answer: A

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89. The magnifying power of simple microscope is 6 when the image is formed at distance of distinct vision (25 cm) from its optical centre. The focal power of the simple microscope in dipotre is

A. -20

B. -2

C. 2

D. 20

Answer: D

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Criticalthinking

1. A concave mirror is placed on a horizontal table, with its axis directed vertically upwards. Let O be the pole of the mirror and C its

centre of curvature. A point object is placed at C. It has a real image, also located at C. If the mirror is now filled with water, the image will be.

A. real and remain at C

B. real and located at a poitn between C an infinity

C. virtual and lcoated at a point between C and O.

D. real and located at a point between C and O

Answer: D

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2. In case of eflection from curved surface

A. the normal is considered to be tangentto the spherical surface at the point of incidence

B. the normal is considered to be drawn at the polt of the spherical suface only

C. the normal is the principle axis only.

D. the normal isnot required.

Answer: A

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3. A boy and lamb post are 80 m away from a concave mirror of focal length 20 cm. the boyd walks 40 m towrds the mirror. The boy will see

A. his imagesn inverted and same size while that of the lamp post as inverted and dimunished.

B. inverted and diminshed images of both himself and the lamp post.

C. his imageinverted and enlarged while that of the lamp post as inverted and same sizes

D. his image erect and enlarged while that of the lamp post as inverted and same

size.

Answer: A

View Text Solution

4. A person standing 12 cm away from mirror A of focal length 10 cm see his image inverted and enlarged. When the mirror A is replaced by mirror B of same focal length the person observes diminshed and rerect image. Mirrors A and B are respectively.

A. concave and plane

B. concave and convex

C. convex and plane

D. convex and concave.

Answer: B

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5. A plane mirror reflecting a ray of incident light is rotated through an angle q about an axis through the point of incidence in the

plane of the mirror perpendicular to the plane of incidence, then

(1) The reflected ray rotates through an angle 2q

(2) The incident ray is fixed

(3) The reflected ray does not rotate

(4) The reflected ray rotates through an angle q

A. does not rotate

B. rotates through an angle $\left(\frac{\theta}{2}\right)$

C. rotates through an angle θ

D. rotates through an angle (2θ)

Answer: D

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6. In a concave mirrorr experiment, an object is placed at a distance x_1 from the focus and the image is formed at a distance x_2 from the focus. The focus length of the mirrorr would be

A. x_1x_2

B. $\sqrt{x_1 x_2}$

C. $\frac{x_1 + x_2}{2}$

D. $\sqrt{\frac{x_1}{x_2}}$

Answer: B

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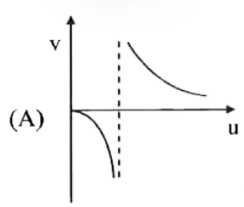
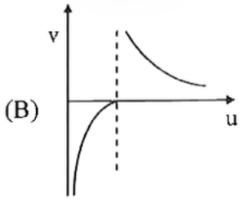
7. As the position of an object (u) reflected from a concave mirror is varied, the position of the image (v) also varies. By latting the u

changes from 0 to $+\infty$ the graph between v versus u will be

A.



B.



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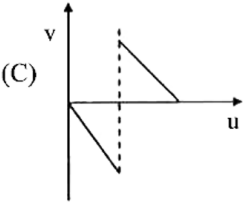

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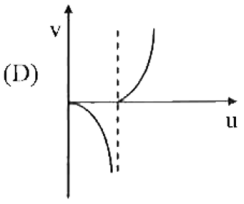


Answer: A

Watch Video Solution

8. Assertion : A double convex lens $(\mu = 1.5)$ has focal length $10cm$. When the lens is immersed in water $(\mu = 4/3)$ its focal length becomes $40cm$.

Reason : $\frac{1}{f} = \frac{\mu_1 - \mu_m}{\mu_m}\left(\frac{1}{R_1} - \frac{1}{R_2}\right)$

A. 8 cm

B. 20 cm

C. 30 cm

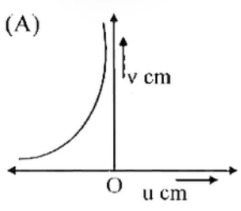
D. 40 cm

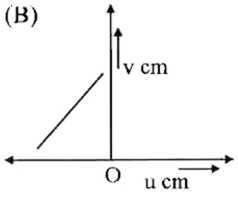
Answer: D

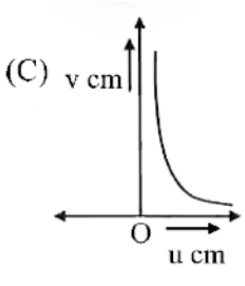
Watch Video Solution

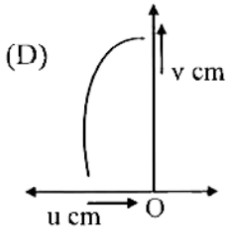
9. A student measures the focal length of a convex lens by putting an object pin at a distance u from the lens and measuring the distance v of the image pin. The graph

between u and v plotted by the student should look like

A. 

B. 

C. 

D. 

Answer: A

Watch Video Solution

10. How does the magnification (m) of the real image formed by a lens vary with the distance (x) of the object from the focus of a concave mirror ?

A. $m \propto r$

B. $m \propto \frac{1}{x}$

C. $m \propto x^2$

D. $m \propto \frac{1}{x^2}$

Answer: B

Watch Video Solution

11. An object is placed at a distance of $f/2$ from a convex lens. The image will be

A. at one of the foc, virtual and double is its size.

B. at one 2 f and same size

C. at one 2 f virtual and erect.

D. virtual and half of size

Answer: A

Watch Video Solution

12. The power of a thin convex lens $\left({}_a\mu_g = 1.5\right)$ is $+5.0D$. When it is placed in liquid of refractive index ${}_a\mu_l$ then it behaves as a concavelens of focal length 100 cm. the refractive index of liquid ${}_a\mu_i$ will be

A. 1.875

B. 1.68

C. $\sqrt{3}$

D. $\sqrt{2}$

Answer: A

Watch Video Solution

13. A screen is placed 90 cm from an object. The image an object on the screen is formed by a convex lens two different locations

separated by 20 cm. the focus length of the lense is

A. $20.4cm$

B. $21.4cm$

C. $22.5cm$

D. $28.5cm$

Answer: B

Watch Video Solution

14. When two thin lenses are kept in contanct, the focal length of the combination is

A. the geometricamean of the two focal lenghts.

B. the same as the larger focal length

C. gretter than either focal length

D. smaller than either focal length

Answer: D

 Watch Video Solution

15. When two or more lnses of magnification m_1, m_2, m_3 are kept in contact, the total magnification (m) produced is given by

A. $m = m_1 + m_2 + m_3 + \ldots +$

B. $m = m_1 + m_2 - m_3 - m_4 \ldots$

C. $m = \frac{m_1 m_2}{m_3} + \frac{m_2 m_4}{m_4} + \ldots.$

D. $m = m_1 \times m_2 \times m_3 \times \ldots$

Answer: D

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16. A concave lens and a convex lens have same focal length of $20cm$ and both put in contact this combination is used to view an object $5cm$ long kept at $20cm$ from the lens combination. As compared to object the image will be

A. magnified and inverted.

B. reduced and erct

C. of the same size as the object and erect

D. of the same size as the object but inverted

Answer: C

Watch Video Solution

17. If we need a magnification of 400 from compound microscope of tube length 150 mm and an objective of focal length 5 mm, the focal length of the eye-piece, should be dose to : (final Image is at infinity).

A. $2.0cm$

B. $2.2cm$

C. $2.4cm$

D. $2.5cm$

Answer: B

Watch Video Solution

18. When objects at different distances are seen by the eye, which of the following remai constant?

A. The focal length of the eye lens

B. The object distance from the eye lens.

C. The radii of curvature of the eye lens.

D. The iamge distance from the eye lens.

Answer: D

Watch Video Solution

19. If astronomical telescope of length $1.53m$ has magnifying powerof magnitude 50,the values of f_0 and f_e are

A. $f_o = 0.03m, f_e = 1.5m$

B. $f_o = 1.55m f_e = 0.02m$

C. $f_o = 1.55m f_e = -0.03m$

D. $f_o = 1.5m f_e = 0.03m$

Answer: D

Watch Video Solution

20. When we view object of height 15 m with a telescop of magnifying power 10. the object appears _____

A. 10 times taller

B. 15 times taller

C. 10 times taller

D. 15 times taller

Answer: C

Watch Video Solution

21. The focal length of the objective and eye piece of a telescope are respectively $100cm$ and $2cm$. The moon subtends and

angle of 0.5°, the angle subtended by the moon's image will be.

A. 100°

B. 50°

C. 25°

D. 10°

Answer: C

Watch Video Solution

22. The objective of telescope A has a diameter 3 times that of the objective of telescope B. How much greater amount of light is gathered by A compared to B ? Show that range of A is three times the range of B.

A. $\frac{1}{9}$

B. $\frac{1}{3}$

C. 3

D. 9

Answer: D

Watch Video Solution

23. A fly is sitting on the objective of a telescop pointed to the moon takne through the elescope ?

A. The entire filed of vision is blocked.

B. There is an image of the fly on the photograph

C. There is no effect at all

D. The image of the moon is of lesser intensity.

Answer: D

Watch Video Solution

24. An object is placed at a distance u from a concave mirror and its real image is received on a screen placed at a distance of v from the mirror. If f is the focal length of the mirror, then the graph between 1/v versus 1/u is

A. 

B. 

C. 

D. 

Answer: B

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25. The distance between an object and the screen is 75 cm. When a convex lens of focal length 12 cm is placed in the between

theobject and the screen, magnification of real formed can be (magnitude only)

A. 2

B. 4

C. 8

D. 16

Answer: B

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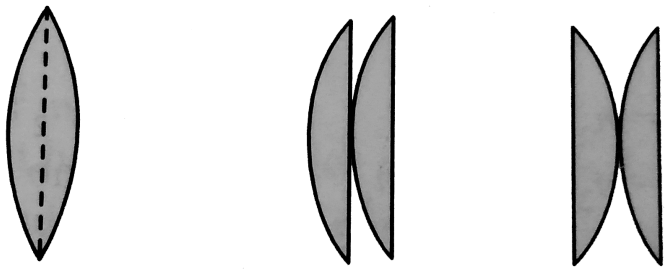
26. Two similar planoconvex lenses are combined together in three different ways as shown in the adjoining figure. The ratio of the focal lengths in three cases will be



A. $2:2:1$

B. $1:1:1$

C. $1:2:2$

D. $2:1:1$

Answer: B

Watch Video Solution

27. A virtual cannot be caought on a screen, Yet when we see a virtual image, we bring it to the screen i.e., retina of our eye. This happnes because

A. we have two eyes

B. eye lens is convergent

C. eye lens is divergent

D. image or retina is in the from of electrical neural pulse.

Answer: B

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28. When the wavelenght of the light used is increased, the focal length of a spherical mirror

A. remains the same

B. decreases to half its value.

C. decreases slightly

D. increases.

Answer: A

Watch Video Solution

29. If two power of a thick lense is P_1 and that of a thin lens is P_2 then

A. $P_1 < P_2$

B. $P_1 = P_2$

C. $P_1 > P_2$

D. $P_1 = \frac{P_2}{2}$

Answer: C

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30. How will you arrange the two plane mirros so that whatever may be the angle of incidence, the incident ray and the reflected

ray from the two mirrors will be paralle to each other ?

A. The two plane mirrors should be parllel to each other

B. Two plane mirrors shold be inclined at an angle of 30°

C. Two plane mirrors shold be inclined at an angle of 45°

D. Two plane mirrors shold be perpendicular to each other

Answer: D

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31. An object is placed in front of a convex mirror at a distance of 50cm. A plane mirror is introduced covering the lower half of the convex mirror. If the distance between the object and the plane mirror is 30cm, it is found that there is no parallax between the images formed by the two mirrors. What is the radius of curvature of the convex mirror?

A. $12.5cm$

B. $15.0cm$

C. $25.0cm$

D. $30.0cm$

Answer: C

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32. A square wire of side $3.0cm$ is placed $25cm$ away from a concave mirror of focal length $10cm$. What is the area enclosed by the image

of the wire ? The centre of the wire is on the axis of the mirror, with its two sides normal to the axis.

A. $2cm^2$

B. $4cm^2$

C. $6cm^2$

D. $8cm^2$

Answer: B

Watch Video Solution

33. If a lens is cut into two pieces perpendicular to the principal axis and only one part is used, the intensity of the iamage will be

A. same

B. $\frac{1}{2}$ times

C. 2 times

D. infinite

Answer: A

Watch Video Solution

34. Assertion : A concave mirror and convex lens both have the same focal length in air. When they are submerged in water, they will have same focal length.

Reason refractive index of water is smaller than be refractive index of air.

A. Assertion is True, Reason is True , Reason is a correct exaplanation for Assertion.

B. Assertion is True, Reason is True : Reason is not correct exaplanation for Assertion.

C. Assertion is True. Reason is False

D. Assertion is False, Reason is False.

Answer: D

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Competitive Thinking

1. An object is placed at a distance of $40cm$ from a concave mirrorr of focal length $15cm$. If the object is displaced through a distance of

$20cm$ towards the mirrorr, the displacement of the image will be

A. 30 cm away from the mirror

B. 36 cm away from the mirror

C. 30 cm towards the mirror

D. 36 cm towards the mirror

Answer: B

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2. A point object is placed at a distance of 30 cm from a convex mirror of focal length 30 cm. The image will form at

A. infinity

B. focus

C. pole

D. 15 cm behind the mirror

Answer: D

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3. Which of the following statements is incorrect?

A. The magnification produced by a convex mirror is always less than one.

B. A virtual, erect, same sized image can be obtained using a plane mirror.

C. A virtual, erect, magnified image can be formed using a concave mirror.

D. A real, inverted, same-sized image can be formed using a convex mirror.

Answer: D

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4. A concave mirror of focal length f (in air) is immersed in water $(\mu = 4/3)$. The focal length of the mirror in water will be

A. $\frac{4}{3}f$

B. $\frac{3}{4}f$

C. f

D. $\frac{7}{3}f$

Answer: C

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5. A linear object of heigth 10 cm is kept in front of concave mirror of radius of curvature 15 cm, at distance of 10 cm. The image formed is

A. magnified and erect

B. magnified and inverted

C. diminished and erect

D. diminished and inverted

Answer: B

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6. A person wants a real image of his own, 3 times enlarged. Where should he stand in

front of a concave mirror of radius of curvature of 30cm.

A. 90 cm

B. 10 cm

C. 20 cm

D. 30 cm

Answer: C

 Watch Video Solution

7. Consider a light source placed at a distance of 1.5 m along the aixs facing facing the convex side of a spherical mirror of radius of curvature 1m. The position (s), nature and magnification (m) of the image are

A. s'=0.375 m, Virtual, upright, m=0.25

B. s'=0.375 m, Real, inverted, m=0.25

C. s'=3.75 m, Virtual, inverted, m=2.5

D. s'=3.74 m, Real upright, m=2.5

Answer: A

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8. The power of plane mirror is _____.

A. ∞

B. 0

C. 2D

D. 4D

Answer: B

Watch Video Solution

9. Two convex lenses of focal lengths f_1 and f_2 form images with magnification m_1 and m_2, when used individually for an object kept at the same distance from the lenses. Then f_1 / f_2 is

A. $\dfrac{m_1(1+m_1)}{m_2(1+m_2)}$

B. $\dfrac{m_1(1+m_2)}{m_2(1+m_1)}$

C. $\dfrac{m_2(1+m_1)}{m_1(1+m_2)}$

D. $\dfrac{m_2(1+m_2)}{m_1(1+m_1)}$

Answer: B

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10. According to Cartesian sign convention, in ray optics

A. all distances are taken negative

B. all distances in the direction of incident ray are taken positive

C. all distances are taken positive

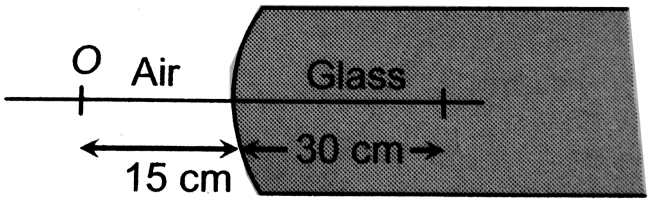
D. all distances in the direction of incident ray are taken negative

Answer: B

 Watch Video Solution

11. A poinit object O is placed in front of a glass rod having spherical end of radius of curvature $30cm$. The image would be formed

at



A. 30 cm left

B. infinity

C. 1 cm to the right

D. 18 cm to the left

Answer: A

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12. A candle placed 25 cm from a lens, forms an image on a screen placed 75 cm on the other end of the lens. The focal length and type of the lens should be

A. $+18.75$ cm and convex lens

B. 18.75 cm and concave lens

C. $+20.25$ cm and convex

D. -20.25 cm and concave lens

Answer: A

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13. Focal length of a convex lens is 20 cm and its R.I. is 1.5. It produces an erect, enlarged image if the distance from the object of the lens is

A. 40 cm

B. 30 cm

C. 15 cm

D. 20 cm

Answer: C

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14. A convex lens (with material of refractive index of 3/2) has two surfaces of equal radii of curvature R. The magnitude of its focal length is

A. $\frac{R}{2}$

B. R

C. 2R

D. zero

Answer: B

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15. Convex lens made up of glass $\left(\mu_g = 1.5\right)$ and radius of curvature R is dipped into water. Its focal length will be (Refractice index of water =4/3)

A. 4R

B. 2R

C. R

D. R/2

Answer: A

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16. A convex glass lens $\left(\mu_g = 1.5\right)$ has a focal length of 8 cm when placed in air. What is the focal length of the lens when it is immersed in

water ?

$\left(\mu_{\omega} = \frac{4}{3}\right)$

A. 4 cm

B. 8 cm

C. 16 cm

D. 32 cm

Answer: D

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17. A double convex thin lens made of glass (refractive index $\mu = 1.5$) has both radii of curvature of magnitude 20 cm . Incident light rays parallel to the axis of the lens will converge at a distance L such that

A. L=20 cm

B. L=10 cm

C. L=40 cm

D. $L = \frac{20}{3}$ cm

Answer: A

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18. A plano-convex lens is made of material having refractive index 1.5. The radius of curvature of curved surface is 60 cm. The focal length of the lens is _____ cm.

A. -60

B. 120

C. 60

D. -120

Answer: B

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19. Two identical thin planoconvex glass lenses (refractive index 1.5) each having radius of curvature of $20cm$ are placed with their convex surfaces in contact at the centre. The intervening space is filled with oil of refractive index 1.7. The focal length of the combination is

A. -20 cm

B. 25 cm

C. -50 cm

D. 50 cm

Answer: C

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20. A thin convex lens made from crown glass $\left(\mu = \frac{3}{2}\right)$ has focal length f. When it is

measured in two different liquids having refractive indices $\frac{4}{3}$ and $\frac{5}{3}$, it has the focal lengths f_1 and f_2 respectively . The correct relation between the focal lengths is ,

A. $f_1 = f_2 < f$

B. $f_1 > f$ and f_2 becomes negative

C. $f_2 > f$ and f_1 becomes negative

D. f_1 and f_2 both become negative

Answer: B

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21. In an optics experiment, with the position of the object fixed, a student varies the position of a convex lens and for each position, the screen is adjusted to get a clear image of the object. A graph between the object distance u and the image distance v, from the lens, is plitted using the same scale for the two axes. A straight line passing through the origin and making an angle of 45° with x-axis meets the experimental curve at P. The coordinates of P will be.

A. (2f, 2f)

B. $\left(\frac{f}{2}, \frac{f}{2}\right)$

C. (f,f)

D. (4f,4f)

Answer: A

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22. The equiconvex lens has focal length f. If is cut perpendicular to the principal axis passin

through optical centre, then focal length of each half is

A. $\frac{f}{2}$

B. f

C. $\frac{3f}{2}$

D. 2f

Answer: D

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23. A converging beam of rays in incident on a diverging lens. Having passed through the lens the rays intersect at a point $15cm$ from the lens. If the lens is removed, the point where the rays meet, move $5cm$ closer to the mounting that holds the lens. Find the focal length of the lens.

A. -30 cm

B. 5 cm

C. -10 cm

D. 20 cm

Answer: A

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24. Calculate the focal length of a reading glass of a person, if the distance of distinct vision is 75cm.

A. 75.2 cm

B. 25.6 cm

C. 100.4 cm

D. 37.5 cm

Answer: D

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25. A beam of parallel rays is brought to focus by a planoconvex lens. A thin Concave lens of the same focal length is joined to the first lens. The effect of this is

A. focal point shifts away from the lens by a small distance.

B. focus remains undisturbed.

C. focus shifts to infinity.

D. focal point shifs towards the lens by a small distance.

Answer: C

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26. A plano-convex lens fits exactly into a plano-concave lens. Their plane surfaces are parallel to each other. If the lenses are made of different material of refractive indices μ_1 and μ_2 and R is the radius of curvature of the curved surface of the lenses, then focal length of the combination is

A. $\frac{R}{2(\mu_1 + \mu_2)}$

B. $\frac{R}{2(\mu_1 - \mu_2)}$

C. $\frac{R}{(\mu_1 - \mu_2)}$

D. $\frac{R}{(\mu_2 - \mu_1)}$

Answer: C

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27. Two lenses of power $+12$ and -2 dioptres are placed in contact. The combined focal length of the combination will be

A. 10 cm

B. 12.5 cm

C. 16.6 cm

D. 8.33 cm

Answer: A

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28. A comvex lens and a concave lens are placed in contact. The ratio of magnitude of the power of the convex lens to that of the concave lens is 4:3. If the focal length of the

convex lens is 12 cm, then the focal length of the combination will be

A. 16 cm

B. 24 cm

C. 32 cm

D. 48 cm

Answer: D

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29. Two identical glass $(\mu_g = 3/2)$ equiconvex lenses of focal length f are kept in contact. The space between the two lenses is filled with water $(\mu_w = 4/3)$. The focal length of the combination is

A. 3f/4

B. f/3

C. f

D. 4f/3

Answer: A

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30. Two convex lenses of focal length f_1 and f_2 are mounted coaxially separated by a distance. If the power of the combination is zero, the distance between the lenses is

A. $d = (f_1 + f_2)$

B. $d = (f_1 - f_2)$

C. $d = \sqrt{f_1 f_2}$

D. $d = \frac{(f_1 - f_2)}{2}$

Answer: A

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31. A diverging lens with magnitude of focal length $25cm$ is placed at a distance of $15cm$ from a converging lens of magnitude of focal length $20cm$. A beam of parallel light falls on the diverging lens. The final image formed is.

A. real and at a distance of 40 cm from the divergent lens.

B. real and at a distance of 6 cm from the convergent lens.

C. real and at a distance of 40 cm from convergent lens.

D. virtual and at a distance of 40 cm from convergent lens.

Answer: C

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32. A convex lens of focal length 12.5 cm is used as a simple microscope. When the image is formed at infinite, magnification is _____ (Near point for the normal vision is 25 cm).

A. 25

B. 2.5

C. 2.0

D. 1

Answer: C

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Watch video solution

33. Least distance of distinct vision is 25 cm . Magnifying power of simple microscope of focal length 5 cm is

A. $\frac{1}{5}$

B. 5

C. $\frac{1}{5}$

D. 6

Answer: D

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34. In compound microscope, the focal length and aperture of the objective used is respectively

A. large and lagre

B. large and small

C. short and large

D. short and small

Answer: D

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35. In a compound microscope, the intermediate image is

A. virtual, erect and magnified.

B. real erect and magnified.

C. real, inverted and magnified.

D. virtual erect and reduced.

Answer: C

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36. A compound micrscope consists of an objective of focal length 1.0 cm and an eyepiece of focal length 5.0 cm separated by 12.2 c.a. At wht distance from the objective should a object be placed to focus it prope4y so that the final image is formed at the least distance of clear vision (25cm)? b. calculate the angular magnificationn in this case.

A. -1.1 cm

B. -2.1cm

C. -1.5 cm

D. -2.5 cm

Answer: A

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37. An obsever looks at a distant tree of height 10m with a telescope of magnifying power of 20. to the observer the tree appears:

A. 10 times nearer

B. 20 times taller

C. 20 times nearer

D. 10 times taller

Answer: C

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38. An astronomical telescope has an angular magnification of magnitude 5 for distant object. The separation between the objective and the eyepiece is 36 cm and the final image

is formed at infinity. The focal length f_0 of the objective and the focal length f_0 of the eyepiece are

A. $f_o = 45cm$ and $f_e = -9cm$

B. $f_o = 7.2cm$ and $f_e = 5cm$

C. $f_o = 50cm$ and $f_e = 10cm$

D. $f_o = 30cm$ and $f_e = 6cm$

Answer: D

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39. On which of the following does the magnifying power of a telescope depends

A. The focal length of the objective only.

B. The diameter of aperture of the objective only.

C. The focal length of objective and that of the eye piece.

D. The diameter of aperture of the objective and that of the eye piece.

Answer: C

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40. The number of lenses in a terrestrial telescope is

A. two

B. three

C. four

D. six

Answer: B

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41. To avoid spherical aberration, quality reflecting telescopes use mirrors whose cross-sectional shapes are

A. prismatic

B. elliptic

C. parabolic

D. spherical

Answer: C

Watch Video Solution

42. An astronomical telesope has objective and eyepiece of focal lengths $40cm$ and $4cm$ respectively. To view an object $200cm$ away from the objective, the lenses must be separated by a distance :

A. 50.0 cm

B. 54.0cm

C. 37.3 cm

D. 46.0 cm

Answer: B

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43. A telescope using an eye piece of focal length 3 cm has a magnification 10 in normal adjustment. If the telescope is now used to view an object placed at a distance of 180 cm

from the objective, the new length of the telescope is (assume final image is at infinity).

A. 36 cm

B. 39 cm

C. 32 cm

D. 33 cm

Answer: B

Watch Video Solution

44. In an astronomical telescope in normal adjustment a straight black line of length L is drawn on inside part of objective lens. The eye piece forms a real image of this line. The length of this image is I. The magnification of the telescope is

A. $\frac{L}{I}$

B. $\frac{L}{I} + 1$

C. $\frac{L}{I} - 1$

D. $\frac{L + I}{L - I}$

Answer: A

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45. The ratio of the diameter of the sun to the distance between the earth and the sun is approximately 0.009. The approximate diameter of the image of the sun formed by a concave spherical mirror of radius of curvature 0.4 m is

A. $4.5 \times 10^{-6} m$

B. $4.0 \times 10^{-6} m$

C. 3.6×10^{-3} m

D. 1.8×10^{-3}m

Answer: D

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46. A point object is held above a thin equiconvex lens at its focus. The focal length is 0.1 m and the lens rests on a horizontal thin plane mirror. The final image will be formed at

A. infinite distance above the lens.

B. 0.1 m above the centre of the lens.

C. infinite distance below the lens.

D. 0.1 m below the centre of the lens.

Answer: B

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47. A concave lens of glass, refractive index 1.5 has both surfaces of same radius of curvature

R. On immersion in a medium of refractive index 1.75, it will behave as a

A. convergent lens of focal length 3.5 R

B. convergent lens of focal length 3R

C. divergent lens of focal length 3.5 R

D. divergent lens of focal length 3R.

Answer: A

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48. Given a point source of light, which of the following can produce a parallel beam of light

A. Convex mirror.

B. Concace mirror.

C. Concave lens.

D. Two plane mirrors inclined at an angle of 90°

Answer: B

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49. An infinitely long rod lies along the axis of a concave mirror of focal length f. The near end of the rod is distance $u > f$ from the mirror. Its image will have length

A. $\frac{uf}{u+f}$

B. $\frac{uf}{u-f}$

C. $\frac{f^2}{u+f}$

D. $\frac{f^2}{u-f}$

Answer: D

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50. Diameter of a plano-convex lens is 6cm and thickness at the centre is 3mm. If speed of light in material of lens is $2 \times 10^8 \frac{m}{s}$, The focal length of the lens is

A. 15 cm

B. 20 cm

C. 30 cm

D. 10 cm

Answer: C

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51. The image of an object, forme by a plano-convex lens at a distance of 8m behind the lens, is real and is one-third the size of the object. The wavelength of light inside the lens is $\frac{2}{3}$ times the wavelength is free space. The radius of the curved surface of the lens is

A. 1 m

B. 2 m

C. 3 m

D. 6 m

Answer: C

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52. By placing a comvex lens of focal length equal to 15.0 cm between an object and a screen separated by a distance of 75.0 cm, the

sizes of the images obtained are 6.0 cm and $\frac{2}{3}cm$. The size of the object must be

A. 2.0 cm

B. 4.0 cm

C. 3.0 cm

D. 1.5 cm

Answer: A

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53. For a normal eye, the cornea of eye provides a converging power of $40D$ and the least converging power of the eye lens behind the cornea is $20D$. Using this information, the distance between the retina and the cornea eye lens can be estimated to be

A. 5 cm

B. 2.5 cm

C. 1.67 cm

D. 1.5 cm

Answer: C

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54. A person can see objects clearly only when they lie between $50cm$ and $400cm$ from his eyes. In order to increase the maximum distance of distinct vision to infinity, the type and power of the correcting lens, the person has to use, will be

A. convex, +0.15 dioptre

B. convex, +2.25 dioptre

C. concave, -0.25 dioptre

D. concave, -0.2 dioptre

Answer: C

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55. The focal length of a plano-convex lens is f and its refractive index is 1.5 it is kept over a plane galss plate with its curved surface touching the glass plate. The gap between the

lens and the glass plate is filled by a liquid. As a result the effective focal length of the combination becomes $2f$. Then the refractive index of the liquid is

A. 1.5

B. 2

C. 1.25

D. 1.33

Answer: C

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56. A convex lens of glass $(\mu_g = 1.45)$ has focal length f_g is air. The lens is immersed in a liquid of refractive index (μ_g) 1.3. The ratio of the f_{liquid} / f_g is

A. 3.9

B. 0.23

C. 0.43

D. 0.39

Answer: A

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57. Convex lens is made of glass of refractive index 1.5 If the radius of curvature of each of the two surfaces is $20cm$ find the ratio of the powers of the lens, when placed in air to its power, when immersed in a liquid of refractive index 1.25.

A. $2:5$

B. $5:2$

C. $3:2$

D. $2:3$

Answer: B

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58. Relative difference of focal lengths of objective and eye lens in the microscope and telescope is given as

A. It is equal in both.

B. It is more in telescope.

C. It is more in microscope.

D. It may be more in any one.

Answer: B

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59. Three thin lenses are combined by placing them in contact with each other to get more magnification in an optical instrement. Each lens has a focal length of 3 cm. If the least distance of distinct vision is taken as 25 cm,

the total magnification of the lens combination in normal adjustment is

A. 9

B. 26

C. 300

D. 3

Answer: D

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60. If the focal length of the objective lens is increased then

A. microscope will increase but that of telescope decrease.

B. microscope and telecope both will increase.

C. microcope and telescope both will decrease.

D. microscope will decrease but that of telescope will increase.

Answer: D

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Evaluation Test

1. When image is fomred by reflaction, the field of veiw is maximum for

A. plane mirror

B. convex mirror

C. concave mirror

D. cylinder mirror.

Answer: B

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2. A candle flame 2 cm high is placed at distance of 2 meter from a wall. How far from the wall must a concave mirror to placed in

order to form an image of the flame 6 cm high on the wall ?

A. 225 cm

B. 300cm

C. 450 cm

D. 500 cm

Answer: B

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3. An infinitely long rod lies along the axis of a concave mirror of focal length f. The near end of the rod is distance $u > f$ from the mirror. Its image will have length

A. $\frac{uf}{u-f}$

B. $\frac{f^2}{u-f}$

C. $\frac{f^2}{u+f}$

D. $\frac{uf}{u+f}$

Answer: B

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4. Assertion : If objective and eye lens of a mcroscope are interchanged then it can work as telsecope.

Reason : The object of telescope has large focal lengths.

A. Assertion is True, Reason is True , Reason is a correct exaplanation for Assertion.

B. Assertion is True, Reason is True : Reason is not correct exaplanation for Assertion.

C. Assertion is True. Reason is False

D. Assertion is False, Reason is False.

Answer: D

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5. Focal length of a convex/ concave mirror depends on

A. distance of object u.

B. distance of image v

C. both u and v.

D. radius of curvature

Answer: D

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6. A convex lens focal lenghts 30 cm made of glass of refractive index 1.5 is immersed in water having refrctive 1.33. The change in the focal length of lens is

A. 62.3 cm

B. $87.4cm$

C. $58.2cm$

D. $73.6cm$

Answer: B

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7. Magifying power of a telescop in normal adjustment when final images of a star is

formed at inifnity is 9. the image of a star is formed at inf

A. 54 cm

B. 9 cm

C. 6 cm

D. 36 cm

Answer: A

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8. Assertion : If radius of curvature of mirror is doubled, focal length is halved.

Reason : Radius of curvature =2 times the focal lenghts

A. Assertion is True, Reason is True , Reason is a correct exaplanation for Assertion.

B. Assertion is True, Reason is True : Reason is not correct exaplanation for Assertion.

C. Assertion is True. Reason is False

D. Assertion is False, Reason is False.

Answer: D

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9. An experimeter needs to heat a samall sample to 700 K, but the only availabel oven has a maximum temperature of 500 K. Could experimenter heat the sample to 700 K by using a large lens to concentrate the radiation from the over into the sample ?

A. Yes, if the sample is placed at the focal point of the lens

B. No, because it would violate the lawof conservation of energy.

C. No, becouse it would the second law of thermodynamics

D. Yes, if the areas of the fron of the oven is at least much as the area of the fron of the sample

Answer: A

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10. Assertion : A density uses a convex mirror to examine a smalll cavity in the both.

Reason : A convex mirror forms only diminished virtual images.

A. Assertion is True, Reason is True , Reason is a correct exaplanation for Assertion.

B. Assertion is True, Reason is True : Reason is not correct exaplanation for Assertion.

C. Assertion is True. Reason is False

D. Assertion is False, Reason is False.

Answer: D

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11. A man with normal near- point (25c m) reads a book with small print using a magnifying glass L a thin convex lens of focal length 5 cm.

(i) What is the closest and the farthest

distance at which he can read the book when viewing thorugh the magnifying glass ?

(ii) What is the maximum and the minimum angular magnification (magnifying power) possible using the above simple microscope ?

A. $-5:6$

B. $5:6$

C. $6:5$

D. $-6:5$

Answer: B

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12. For a given compound microscope, increases in lenghts of tube

A. increases magnifying power

B. has no effect on magnifying power

C. decreases magnifying power

D. doubles the magnifying power

Answer: C

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13. Which of the following (referred to a sphericla mirror) do (does) not depend on whether the rays are paraxial or not?

A. Radius of curvature

B. Focus

C. Pole

D. Principal axis.

Answer: B

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14. Statement-1 : A single lens produces a coloured image of an object illuminated by white light.

Statement-2 : The refractive index of material of lens is different for different wavelengths of light.

A. Assertion is True, Reason is True , Reason is a correct exaplanation for Assertion.

B. Assertion is True, Reason is True : Reason is not correct exaplanation for Assertion.

C. Assertion is True. Reason is False

D. Assertion is False, Reason is False.

Answer: A

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