148. The spectrum obtained from a sodium vapour lamp is an example of [MH CET 2003]
(a) Absorption spectrum (b) Emission spectrum
(c) Continuous spectrum (d) Band spectrum

149. The sky would appear red instead of blue if [DCE 2004]
(a) Atmospheric particles scatter blue light more than red light
(b) Atmospheric particles scatter all colours equally
(c) Atmospheric particles scatter red light more than the blue light
(d) The sun was much hotter

150. Sir C.V. Raman was awarded Nobel Prize for his work connected with which of the following phenomenon of radiation
(a) Scattering (b) Diffraction
(c) Interference (d) Polarisation

151. In absorption spectrum of *Na* the missing wavelength (*s*) are [BCECE 2005]
(a) 589 *nm* (b) 589.6 *nm*
(c) Both (d) None of these

Human Eye and Lens Camera

1. A far sighted man who has lost his spectacles, reads a book by looking through a small hole (3-4 *mm*) in a sheet of paper. The reason will be
(a) Because the hole produces an image of the letters at a longer distance
(b) Because in doing so, the focal length of the eye lens is effectively increased
(c) Because in doing so, the focal length of the eye lens is effectively decreased
(d) None of these

2. For a normal eye, the least distance of distinct vision is [CPMT 1984]
(a) 0.25 *m* (b) 0.50 *m*
(c) 25 *m* (d) Infinite

3. For the myopic eye, the defect is cured by [CPMT 1990; KCET (Engg.) 2000]
(a) Convex lens (b) Concave lens
(c) Cylindrical lens (d) Toric lens

4. Lens used to remove long sightedness (hypermetropia) is

or

A person suffering from hypermetropia requires which type of spectacle lenses
(a) Concave lens (b) Plano-concave lens
(c) Convexo-concave lens (d) Convex lens

5. Substance on the choroid is
(a) Japan black (b) Nigrim pigment
(c) Carbon black (d) Platinum black

6. Astigmatism (for a human eye) can be removed by using [CPMT 1972; MP PET/PMT 1988; CBSE PMT 1990]
(a) Concave lens (b) Convex lens
(c) Cylindrical lens [CPMT 1983; AFMC 2005] (d) Prismatic lens

7. Circular part in the centre of retina is called [MP PET/PMT 1988]
(a) Blind spot (b) Yellow spot
(c) Red spot (d) None of the above

8. Image formed on the retina is
(a) Real and inverted (b) Virtual and erect
(c) Real and erect (d) Virtual and inverted

9. If there had been one eye of the man, then
(a) Image of the object would have been inverted
(b) Visible region would have decreased
(c) Image would have not been seen three dimensional [AIIMS 1977]
(d) (b) and (c) both

10. A person cannot see distinctly at the distance less than one metre. Calculate the power of the lens that he should use to read a book at a distance of 25 *cm* [CPMT 1977; MP PET 1985, 88; MP PMT 1990]
(a) + 3.0 *D* (b) + 0.125 *D*
(c) – 3.0 *D* (d) + 4.0 *D*

11. How should people wearing spectacles work with a microscope
(a) They cannot use the microscope at all
(b) They should keep on wearing their spectacles
(c) They should take off spectacles
(d) (b) and (c) is both way

12. A man who cannot see clearly beyond 5 *m* wants to see stars clearly. He should use a lens of focal length

[MP PET/PMT 1988; Pb. PET 2003]

(a) – 100 *m* (b) + 5 *m*

(c) – 5 *m* (d) Very large

13. A man can see only between 75 *cm* and 200 *cm*. The power of lens to correct the near point will be

(a) + 8/3 *D* (b) + 3 *D*

(c) – 3 *D* (d) – 8/3 *D*

14. Image is formed for the short sighted person at

[AFMC 1988]

(a) Retina (b) Before retina

(c) Behind the retina (d) Image is not formed at all

15. A man can see the objects upto a distance of one metre from his eyes. For correcting his eye sight so that he can see an object at infinity, he requires a lens whose power is

or

A man can see upto 100 *cm* of the distant object. The power of the lens required to see far objects will be

[MP PMT 1993, 2003]

(a) + 0.5 *D* (b) + 1.0 *D*

(c) + 2.0 *D* (d) – 1.0 *D*

16. A man can see the object between 15 *cm* and 30 *cm*. He uses the lens to see the far objects. Then due to the lens used, the near point will be at

(a) $\frac{10}{3}$ *cm* (b) 30 *cm*

(c) 15 *cm* (d) $\frac{100}{3}$ *cm*

17. The far point of a myopia eye is at 40 *cm*. For removing this defect, the power of lens required will be **[MP PMT 1987]**

(a) 40 *D* (b) – 4 *D*

(c) – 2.5 *D* (d) 0.25 *D*

18. A man suffering from myopia can read a book placed at 10 *cm* distance. For reading the book at a distance of 60 *cm* with relaxed vision, focal length of the lens required will be

[MP PMT 1989]

(a) 45 *cm* (b) – 20 *cm*

(c) – 12 *cm* (d) 30 *cm*

19. If the distance of the far point for a myopia patient is doubled, the focal length of the lens required to cure it will become

(a) Half

(b) Double

(c) The same but a convex lens

(d) The same but a concave lens

20. A presbyopic patient has near point as 30 *cm* and far point as 40 *cm*. The dioptric power for the corrective lens for seeing distant objects is

(a) 40 *D* (b) 4 *D*

(c) – 2.5 *D* (d) 0.25 *D*

21. An imaginary line joining the optical centre of the eye lens and the yellow point is called as

(a) Principal axis (b) Vision axis

(c) Neutral axis (d) Optical axis

22. The light when enters the human eye experiences most of the refraction while passing through

(a) Cornea (b) Aqueous humour

(c) Vitrous humour (d) Crystalline lens

23. The impact of an image on the retina remains for

(a) 0.1 *sec* (b) 0.5 *sec*

(c) 10 *sec* (d) 15 *sec*

24. A person is suffering from myopic defect. He is able to see clear objects placed at 15 *cm*. What type and of what focal length of lens he should use to see clearly the object placed 60 *cm* away **[MP PMT 1991]**

(a) Concave lens of 20 *cm* focal length

(b) Convex lens of 20 *cm* focal length

(c) Concave lens of 12 *cm* focal length

(d) Convex lens of 12 *cm* focal length

25. The sensation of vision in the retina is carried to the brain by

(a) Ciliary muscles (b) Blind spot

(c) Cylindrical lens (d) Optic nerve

26. When the power of eye lens increases, the defect of vision is produced. The defect is known as

(a) Shortsightedness (b) Longsightedness

(c) Colourblindness (d) None of the above

27. A man is suffering from colour blindness for green colour. To remove this defect, he should use goggles of

(a) Green colour glasses (b) Red colour glasses

(c) Smoky colour glasses (d) None of the above

28. In human eye the focussing is done by **[CPMT 1983]**

(a) To and fro movement of eye lens

(b) To and fro movement of the retina

(c) Change in the convexity of the lens surface

(d) Change in the refractive index of the eye fluids

29. A short sighted person can see distinctly only those objects which lie between 10 *cm* and 100 *cm* from him. The power of the spectacle lens required to see a distant object is **[MP PET 1992]**

(a) + 0.5 *D* (b) – 1.0 *D*

(c) – 10 *D* (d) + 4.0 *D*

30. A person can see clearly only upto a distance of 25 *cm*. He wants to read a book placed at a distance of 50 *cm*. What kind of lens does he require for his spectacles and what must be its power **[MP PMT 1992]**

(a) Concave, – 1.0 *D* (b) Convex, + 1.5 *D*

(c) Concave, – 2.0 *D* (d) Convex, + 2.0 *D*

31. The human eye has a lens which has a **[MP PET 1994]**

(a) Soft portion at its centre

(b) Hard surface

(c) Varying refractive index

(d) Constant refractive index

32. A man with defective eyes cannot see distinctly object at the distance more than 60 *cm* from his eyes. The power of the lens to be used will be

(a) + 60 *D* (b) – 60 *D*

(c) – 1.66 *D* (d) $\frac{1}{1.66}D$

33. A person's near point is 50 *cm* and his far point is 3 *m*. Power of the lenses he requires for

(i) reading and

(ii) for seeing distant stars are **[MP PMT 1994]**

(a) – 2 *D* and 0.33 *D* (b) 2 *D* and – 0.33 *D*

(c) – 2 *D* and 3 *D* (d) 2 *D* and – 3 *D*

34. A person wears glasses of power – 2.5 *D*. The defect of the eye and the far point of the person without the glasses are respectively

(a) Farsightedness, 40 *cm* (b) Nearsightedness, 40 *cm*

(c) Astigmatism, 40 *cm* (d) Nearsightedness, 250 *cm*

35. Myopia is due to **[AFMC 1996]**

(a) Elongation of eye ball

(b) Irregular change in focal length

(c) Shortening of eye ball

(d) Older age

36. A person is suffering from the defect astigmatism. Its main reason is

(a) Distance of the eye lens from retina is increased

(b) Distance of the eye lens from retina is decreased

(c) The cornea is not spherical

(d) Power of accommodation of the eye is decreased

37. A person cannot see objects clearly beyond 2.0 *m*. The power of lens required to correct his vision will be **[MP PMT/PET 1998; JIPMER 2000; KCET 2000; Pb. PET 2001]**

(a) + 2.0 *D* (b) – 1.0 *D*

(c) + 1.0 *D* (d) – 0.5 *D*

38. The resolving limit of healthy eye is about **[MP PET 1999; RPMT 1999; AIIMS 2001]**

(a) $1'$ or $\left(\frac{1}{60}\right)^{\circ}$ (b) $1''$

(c) 1^{o} (d) $\frac{1}{60}''$ **[MP PMT 1994]**

39. When objects at different distances are seen by the eye, which of the following remains constant **[MP PMT 1999]**

(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 image distance from the eye lens

40. A person wears glasses of power – 2.0 *D*. The defect of the eye and the far point of the person without the glasses will be

(a) Nearsighted, 50 *cm* (b) Farsighted, 50 *cm*

(c) Nearsighted, 250 *cm* (d) Astigmatism, 50 *cm*

41. An eye specialist prescribes spectacles having a combination of convex lens of focal length 40 *cm* in contact with a concave lens of focal length 25 *cm*. The power of this lens combination in diopters is **[IIT 1997 Cancelled; DPMT 2000]**

(a) + 1.5 (b) – 1.5

(c) + 6.67 (d) – 6.67

42. Match the List *I* with the List *II* from the combinations shown **[ISM Dhanbad 1994]**

(I)	Presbiopia	(A)	Sphero-cylindrical lens
(II)	Hypermetropia	(B)	Convex lens of proper power may be used close to the eye
(III)	Astigmatism	(C)	Concave lens of suitable focal length
(IV)	Myopia	(D)	Bifocal lens of suitable focal length

(a) I-A; II-C; III-B; IV-D (b) I-B; II-D; III-C; IV-A

(c) I-D; II-B; III-A; IV-C (d) I-D; II-A; III-C; IV-B

43. Near and far points of a human eye are **[EAMCET (Med.) 1995; MP PET 2001; BCECE 2004]**

(a) 0 and 25 *cm* (b) 0 and ∞

(c) 25 *cm* and 100 *cm* (d) 25 *cm* and ∞

44. Two parallel pillars are 11 *km* away from an observer. The minimum distance between the pillars so that they can be seen separately will be **[RPET 1997; RPMT 2000]**

(a) 3.2 *m* (b) 20.8 *m*

(c) 91.5 *m* (d) 183 *m*

45. Retina of eye acts like ..... of camera **[AFMC 2003]**

(a) Shutter (b) Film

(c) Lens (d) None of these

46. The hyper-metropia is a **[CBSE PMT 2000]**

[MP PMT 1999]

(a) Short-side defect (b) Long- side defect

(c) Bad vision due to old age (d)

47. Amount of light entering into the camera depends upon **[DCE 2000]**

(a) Focal length of the objective lens

(b) Product of focal length and diameter of the objective lens

(c) Distance of the object from camera

(d) Aperture setting of the camera

48. A man cannot see clearly the objects beyond a distance of 20 *cm* from his eyes. To see distant objects clearly he must use which kind of lenses and of what focal length **[MP PMT 2000]**

(a) 100 *cm* convex (b) 100 *cm* concave

(c) 20 *cm* convex (d) 20 *cm* concave

49. A person uses spectacles of power +2*D*. He is suffering from **[MP PET 2000]**

(a) Short sightedness or myopia

(b) Long sightedness or hypermetropia

(c) Presbyopia

(d) Astigmatism

50. To remove myopia (short sightedness) a lens of power 0.66 *D* is required. The distant point of the eye is approximately **[MP PMT 2001]**

(a) 100 *cm* (b) 150 *cm*

(c) 50 *cm* (d) 25 *cm*

51. A person suffering from 'presbyopia' (myopia and hyper metropia both defects) should use

(a) A concave lens

(b) A convex lens

(c) A bifocal lens whose lower portion is convex

(d) A bifocal lens whose upper portion is convex

52. A person who can see things most clearly at a distance of 10 *cm*. Requires spectacles to enable to him to see clearly things at a distance of 30 *cm*. What should be the focal length of the spectacles **[BHU 2003; CPMT 2004; PM PMT 2005]**

(a) 15 *cm* (Concave) (b) 15 *cm* (Convex)
(c) 10 *cm* (d) 0

53. Far points of myopic eye is 250 *cm*, then the focal length of the lens to be used will be
(a) – 250 *cm* (b) – 250/9 *cm*
(c) + 250 *cm* (d) + 250/9 *cm*

54. A man can see clearly up to 3 *metres*. Prescribe a lens for his spectacles so that he can see clearly up to 12 *metres*
[DPMT 2002]
(a) – 3/4 *D* (b) 3 *D*
(c) – 1/4 *D* (d) – 4 *D*

55. A satisfactory photographic print is obtained when the exposure time is 10 *sec* at a distance of 2 *m* from a 60 *cd* lamp. The time of exposure required for the same quality print at a distance of 4 *m* from a 120 *cd* lamp is
[Kerala PMT 2002]
(a) 5 *sec* (b) 10 *sec*
(c) 15 *sec* (d) 20 *sec*

56. A person can not see the objects clearly placed at a distance more than 40 *cm*. He is advised to use a lens of power
[DCE 2002; MP PMT 2002, 03]
(a) – 2.5 *D* (b) + 2.5 *D*
(c) – 6.25 *D* (d) + 1.5 *D*

57. A person uses a lens of power + 3*D* to normalise vision. Near point of hypermetropic eye is **[CPMT 2002]**
(a) 1 *m* (b) 1.66 *m*
(c) 2 *m* (d) 0.66 *m*

58. A defective eye cannot see close objects clearly because their image is formed
(a) On the eye lens
(b) Between eye lens and retina
(c) On the retina
(d) Beyond retina

59. Image formed on retina of eye is proportional to
[RPMT 2001]
(a) Size of object (b) Area of object
(c) $\frac{\text{Sizeof object}}{\text{Sizeof image}}$ (d) $\frac{\text{sizeof image}}{\text{sizeof object}}$

60. A student can distinctly see the object upto a distance 15 *cm*. He wants to see the black board at a distance of 3 *m*. Focal length and power of lens used respectively will be
[DPMT 2002] [Pb. PMT 2003]
(a) $-4.8\,cm, -3.3\,D$ (b) $-5.8\,cm, -4.3\,D$
(c) $-7.5\,cm, -6.3\,D$ (d) $-15.8\,cm, -6.3\,D$

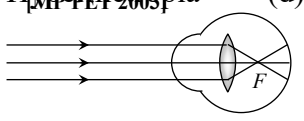
61. A camera objective has an aperture diameter *d*. If the aperture is reduced to diameter $d/2$, the exposure time under identical conditions of light should be made
[Kerala PMT 2004]
(a) $\sqrt{2}$ fold (b) 2 fold
(c) $2\sqrt{2}$ fold (d) 4 fold

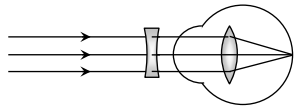
62. The light gathering power of a camera lens depends on
[DCE 2003]
(a) Its diameter only
(b) Ratio of focal length and diameter
(c) Product of focal length and diameter
(d) Wavelength of light used

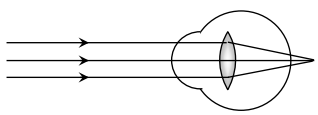
63. The exposure time of a camera lens at the $\frac{f}{2.8}$ setting is $\frac{1}{200}$ second. The correct time of exposure at $\frac{f}{5.6}$ is
[DCE 2003]
(a) 0.4 *sec* (b) 0.02 *sec*
(c) 0.002 *sec* (d) 0.04 *sec*

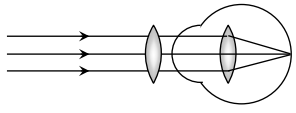
64. Ability of the eye to see objects at all distances is called
[AFMC 2005]
(a) Binocular vision (b) Myopia
(c) Hypermetropia (d) Accommodation

65. **[MP PET 2003] [KCET 2005]**

1. 

2. 

3. 

4. 

Identify the wrong description of the above figures

(a) 1 represents far-sightedness

(b) 2 correction for short sightedness

(c) 3 represents far sightedness

(d) 4 correction for far-sightedness

Microscope and Telescope

1. The focal lengths of the objective and eye-lens of a microscope are 1 *cm* and 5 *cm* respectively. If the magnifying power for the relaxed eye is 45, then the length of the tube is

(a) 30 *cm* (b) 25 *cm*

(c) 15 *cm* (d) 12 *cm*

2. In a compound microscope magnification will be large, if the focal length of the eye piece is

(a) Large (b) Smaller

(c) Equal to that of objective (d) Less than that of objective

3. The focal length of the objective lens of a compound microscope is **[CPMT 1985; MNR 1986; MP PET 1997]**

(a) Equal to the focal length of its eye piece

(b) Less than the focal length of eye piece

(c) Greater than the focal length of eye piece

(d) Any of the above three

4. Microscope is an optical instrument which

(a) Enlarges the object

(b) Increases the visual angle formed by the object at the eye

(c) Decreases the visual angle formed by the object at the eye

(d) Brings the object nearer

5. Magnifying power of a simple microscope is (when final image is formed at $D = 25$ *cm* from eye)

[MP PET 1996; BVP 2003]

(a) $\frac{D}{f}$ (b) $1+\frac{D}{f}$

(c) $1+\frac{f}{D}$ (d) $1-\frac{D}{f}$

6. If in compound microscope m_1 and m_2 be the linear magnification of the objective lens and eye lens respectively, then magnifying power of the compound microscope will be

[CPMT 1985; KCET 1994]

(a) $m_1 - m_2$ (b) $\sqrt{m_1 + m_2}$

(c) $(m_1 + m_2)/2$ (d) $m_1 \times m_2$

7. For which of the following colour, the magnifying power of a microscope will be maximum

(a) White colour (b) Red colour

(c) Violet colour (d) Yellow colour

8. The length of the compound microscope is 14 *cm*. The magnifying power for relaxed eye is 25. If the focal length of eye lens is 5 *cm*, then the object distance for objective lens will be **[CPMT 1979]**

(a) 1.8 *cm* (b) 1.5 *cm*

(c) 2.1 *cm* (d) 2.4 *cm*

9. If the focal length of objective and eye lens are 1.2 *cm* and 3 *cm* respectively and the object is put 1.25 *cm* away from the objective lens and the final image is formed at infinity. The magnifying power of the microscope is **[CPMT 1984]**

(a) 150 (b) 200

(c) 250 (d) 400

10. The focal length of objective and eye lens of a microscope are 4 *cm* and 8 *cm* respectively. If the least distance of distinct vision is 24 *cm* and object distance is 4.5 *cm* from the objective lens, then the magnifying power of the microscope will be

(a) 18 (b) 32

(c) 64 (d) 20

11. When the length of a microscope tube increases, its magnifying power

(a) Decreases (b) Increases

(c) Does not change (d) May decrease or increase

12. In a compound microscope, if the objective produces an image I_o and the eye piece produces an image I_e, then

[MP PET 1990]

(a) I_o is virtual but I_e is real

(b) I_o is real but I_e is virtual

(c) I_o and I_e are both real

(d) I_o and I_e are both virtual

13. The magnifying power of a simple microscope can be increased, if we use eye-piece of
(a) Higher focal length (b) Smaller focal length
(c) Higher diameter (d) Smaller diameter

14. An electron microscope is superior to an optical microscope in
(a) Having better resolving power
(b) Being easy to handle
(c) Low cost
(d) Quickness of observation

15. The magnifying power of a microscope with an objective of 5 *mm* focal length is 400. The length of its tube is 20 *cm*. Then the focal length of the eye-piece is **[MP PMT 1991]**
(a) 200 *cm* (b) 160 *cm*
(c) 2.5 *cm* (d) 0.1 *cm*

16. The maximum magnification that can be obtained with a convex lens of focal length 2.5 *cm* is (the least distance of distinct vision is 25 *cm*) **[MP PET 2003]**
(a) 10 (b) 0.1
(c) 62.5 (d) 11

17. When the object is self-luminous, the resolving power of a microscope is given by the expression
(a) $\frac{2\mu\sin\theta}{1.22\lambda}$ (b) $\frac{\mu\sin\theta}{\lambda}$
(c) $\frac{2\mu\cos\theta}{1.22\lambda}$ (d) $\frac{2\mu}{\lambda}$

18. The power of two convex lenses A and B are 8 *diopters* and 4 *diopters* respectively. If they are to be used as a simple microscope, the magnification of
(a) B will be greater than A
(b) A will be greater than B
(c) The information is incomplete
(d) None of the above

19. Finger prints are observed by the use of
(a) Telescope (b) Microscope
(c) Gallilean telescope (d) Concave lens

20. To produce magnified erect image of a far object, we will be required along with a convex lens, a **[MP PMT 1986]** **[MNR 1983]**
(a) Another convex lens (b) Concave lens
(c) A plane mirror (d) A concave mirror

21. In order to increase the magnifying power of a compound microscope **[CPMT 1984]** **[JIPMER 1986; MP PMT 1997]**
(a) The focal lengths of the objective and the eye piece should be small
(b) Objective should have small focal length and the eye piece large
(c) Both should have large focal lengths
(d) The objective should have large focal length and eye piece should have small

22. If the focal length of the objective lens is increased then **[MP PMT 1994]**
(a) Magnifying power of microscope will increase but that of telescope will decrease
(b) Magnifying power of microscope and telescope both will increase
(c) Magnifying power of microscope and telescope both will decrease
(d) Magnifying power of microscope will decrease but that of telescope will increase

23. The magnification produced by the objective lens and the eye lens of a compound microscope are 25 and 6 respectively. The magnifying power of this microscope is **[Manipal MEE 1995; DPMT 2002]**
(a) 19 (b) 31
(c) 150 (d) $\sqrt{150}$

24. The focal lengths of the objective and the eye-piece of a compound microscope are 2.0 *cm* and 3.0 *cm* respectively. The distance between the objective and the eye-piece is 15.0 *cm*. The final image formed by the eye-piece is at infinity. The two lenses are thin. The distances in *cm* of the object and the image produced by the objective measured from the objective lens are respectively **[IIT 1995]**
(a) 2.4 and 12.0 (b) 2.4 and 15.0
(c) 2.3 and 12.0 (d) 2.3 and 3.0

25. Resolving power of a microscope depends upon **[MP PET 1995]**

(a) The focal length and aperture of the eye lens

(b) The focal lengths of the objective and the eye lens

(c) The apertures of the objective and the eye lens

(d) The wavelength of light illuminating the object

26. The objective lens of a compound microscope produces magnification of 10. In order to get an overall magnification of 100 when image is formed at 25 *cm* from the eye, the focal length of the eye lens should be

(a) 4 *cm* (b) 10 *cm*

(c) $\frac{25}{9}$ *cm* (d) 9 *cm*

27. A person using a lens as a simple microscope sees an **[AIIMS 1998]**

(a) Inverted virtual image

(b) Inverted real magnified image

(c) Upright virtual image

(d) Upright real magnified image

28. Least distance of distinct vision is 25 *cm*. Magnifying power of simple microscope of focal length 5 *cm* is **[EAMCET (Engg.) 1995; Pb. PMT 1999]**

(a) 1 / 5 (b) 5

(c) 1 / 6 (d) 6

29. The objective of a compound microscope is essentially **[SCRA 1998]**

(a) A concave lens of small focal length and small aperture

(b) Convex lens of small focal length and large aperture

(c) Convex lens of large focal length and large aperture

(d) Convex lens of small focal length and small aperture

30. Resolving power of a microscope depends upon **[DCE 1999]**

(a) Wavelength of light used, directly

(b) Wavelength of light used, inversely

(c) Frequency of light used

(d) Focal length of objective

31. In a compound microscope cross-wires are fixed at the point **[EAMCET (Engg.) 2000]**

(a) Where the image is formed by the objective

(b) Where the image is formed by the eye-piece

(c) Where the focal point of the objective lies

(d) Where the focal point of the eye-piece lies

32. In a compound microscope, the focal lengths of two lenses are 1.5 *cm* and 6.25 *cm* an object is placed at 2 *cm* form objective and the final image is formed at 25 *cm* from eye lens. The distance between the two lenses is **[EAMCET (Med.) 2000]**

(a) 6.00 *cm* (b) 7.75 *cm*

(c) 9.25 *cm* (d) 11.00 *cm*

33. The length of the tube of a microscope is 10 *cm*. The focal lengths of the objective and eye lenses are 0.5 *cm* and 1.0 *cm*. The magnifying power of the microscope is about **[MP PMT 2000]**

(a) 5 (b) 23

(c) 166 (d) 500

34. In a compound microscope, the intermediate image is **[IIT-JEE (Screening) 2000; MP PET 2005]**

(a) Virtual, erect and magnified

(b) Real, erect and magnified

(c) Real, inverted and magnified

(d) Virtual, erect and reduced

35. The magnifying power of a compound microscope increases when

(a) The focal length of objective lens is increased and that of eye lens is decreased

(b) The focal length of eye lens is increased and that of objective lens is decreased

(c) Focal lengths of both objective and eye-piece are increased

(d) Focal lengths of both objective and eye-piece are decreased

36. If the red light is replaced by blue light illuminating the object in a microscope the resolving power of the microscope

(a) Decreases (b) Increases

(c) Gets halved (d) Remains unchanged

37. The magnifying power of a simple microscope is 6. The focal length of its lens in *metres* will be, if least distance of distinct vision is 25 *cm*

(a) 0.05 (b) 0.06

(c) 0.25 (d) 0.12

38. Two points separated by a distance of 0.1 *mm* can just be resolved in a microscope when a light of wavelength 6000 Å is used. If the light of wavelength 4800Å is used this limit of resolution becomes **[UPSEAT 2002]**

(a) 0.08 *mm* (b) 0.10 *mm*

(c) 0.12 *mm* (d) 0.06 *mm*

39. A compound microscope has two lenses. The magnifying power of one is 5 and the combined magnifying power is 100. The magnifying power of the other lens is **[Kerala PMT 2002]**

(a) 10 (b) 20

(c) 50 (d) 25

40. The angular magnification of a simple microscope can be increased by increasing

(a) Focal length of lens (b) Size of object

(c) Aperture of lens (d) Power of lens

41. Wavelength of light used in an optical instrument are $\lambda_1 = 4000\,Å$ and $\lambda_2 = 5000\,Å$, then ratio of their respective resolving power (corresponding to λ_1 and λ_2) is **[AIEEE 2002]**

(a) 16 : 25 (b) 9 : 1

(c) 4 : 5 (d) 5 : 4

42. The separation between two microscopic particles is measured P_A and P_B by two different lights of wavelength 2000 Å and 3000 Å respectively, then **[AIEEE 2002]**

(a) $P_A > P_B$ (b) $P_A < P_B$

(c) $P_A < 3/2 P_B$ (d) $P_A = P_B$

43. The image formed by an objective of a compound microscope is **[DCE 2001]**

(a) Virtual and enlarged (b) Virtual and diminished

(c) Real and diminished (d) Real and enlarged

44. An achromatic telescope objective is to be made by combining the lenses of flint and crown glasses. This proper choice is **[MP PMT 2001]**

(a) Convergent of crown and divergent of flint

(b) Divergent of crown and convergent of flint

(c) Both divergent

(d) Both convergent

45. If F_o and F_e are the focal length of the objective and eye-piece respectively of a telescope, then its magnifying power will be **[CPMT 1977, 82, 97, 99, 2003; SCRA 1994; KCET 1999; Pb. PMT 2000; BHU 2001; DCE 2002; RPMT 2003; BCECE 2003, 04]**

(a) $F_o + F_e$ (b) $F_o \times F_e$

(c) F_o / F_e (d) $\frac{1}{2}(F_o + F_e)$

46. The magnifying power of a telescope can be increased by **[CPMT 1979]**

(a) Increasing focal length of the system

(b) Fitting eye piece of high power

(c) Fitting eye piece of low power

(d) Increasing the distance of objects **[Orissa JEE 2002]**

47. A simple telescope, consisting of an objective of focal length 60 *cm* and a single eye lens of focal length 5 *cm* is focussed on a distant object is such a way that parallel rays comes out from the eye lens. If the object subtends an angle 2^o at the objective, the angular width of the image **[CPMT 1979; NCERT 1980; MP PET 1992; JIPMER 1997; UPSEAT 2001]**

(a) 10^o (b) 24^o

(c) 50^o (d) $1/6^o$

48. The diameter of the objective of the telescope is 0.1 *metre* and wavelength of light is 6000 Å. Its resolving power would be approximately

(a) $7.32 \times 10^{-6}\,rad$ (b) $1.36 \times 10^{6}\,rad$

(c) $7.32 \times 10^{-5}\,rad$ (d) $1.36 \times 10^{5}\,rad$

49. A photograph of the moon was taken with telescope. Later on, it was found that a housefly

was sitting on the objective lens of the telescope. In photograph

[NCERT 1970; MP PET 1999]

(a) The image of housefly will be reduced

(b) There is a reduction in the intensity of the image

(c) There is an increase in the intensity of the image

(d) The image of the housefly will be enlarged

50. For a telescope to have large resolving power the

[CPMT 1980, 81, 85; MP PET 1994; DCE 2001; AFMC 2005]

(a) Focal length of its objective should be large

(b) Focal length of its eye piece should be large

(c) Focal length of its eye piece should be small

(d) Aperture of its objective should be large

51. An observer looks at a tree of height 15 *m* with a telescope of magnifying power 10. To him, the tree appears

[CPMT 1975]

(a) 10 times taller (b) 15 times taller

(c) 10 times nearer (d) 15 times nearer

52. The focal length of objective and eye lens of a astronomical telescope are respectively 2 *m* and 5 *cm*. Final image is formed at (i) least distance of distinct vision (ii) infinity. The magnifying power in both cases will be [MP PMT/PET 1988]

(a) – 48, – 40 (b) – 40, – 48

(c) – 40, 48 (d) – 48, 40

53. For observing a cricket match, a binocular is preferred to a terrestrial telescope because

(a) The binocular gives the proper three dimensional view

(b) The binocular has shorter length

(c) The telescope does not give erect image

(d) Telescope have chromatic aberrations

54. To increase the magnifying power of telescope (f_o = focal length of the objective and f_e = focal length of the eye lens)

[MP PET/PMT 1988; MP PMT 1992, 94]

(a) f_o should be large and f_e should be small

(b) f_o should be small and f_e should be large

(c) f_o and f_e both should be large

(d) f_o and f_e both should be small

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

[MH CET 2001]

(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

56. If the telescope is reversed *i.e.* seen from the objective side

(a) Object will appear very small

(b) Object will appear very large

(c) There will be no effect on the image formed by the telescope

(d) Image will be slightly greater than the earlier one

57. The focal length of the objective of a terrestrial telescope is 80 *cm* and it is adjusted for parallel rays, then its magnifying power is 20. If the focal length of erecting lens is 20 *cm*, then full length of telescope will be

(a) 84 *cm* (b) 100 *cm*

(c) 124 *cm* (d) 164 *cm*

58. An astronomical telescope has an angular magnification of magnitude 5 for distant objects. The separation between the objective and the eye piece is 36 *cm* and the final image is formed at infinity. The focal length f_o of the objective and the focal length f_e of the eye piece are

[IIT 1989; MP PET 1995; JIPMER 2000]

(a) $f_o = 45$ *cm* and $f_e = -9$ *cm*

(b) $f_o = 7.2$ *cm* and $f_e = 5$ *cm*

(c) $f_o = 50$ *cm* and $f_e = 10$ *cm*

(d) $f_o = 30$ *cm* and $f_e = 6$ *cm*

59. In an astronomical telescope, the focal lengths of two lenses are 180 *cm* and 6 *cm* respectively. In normal adjustment, the magnifying power will be [MP PET 1990]

(a) 1080 (b) 200

(c) 30 (d) 186

60. The magnifying power of an astronomical telescope for relaxed vision is 16. On adjusting, the distance between the objective and eye lens is 34 *cm*. Then the focal length of objective and eye lens will be respectively **[MP PMT 1989]**

(a) 17 *cm*, 17 *cm* (b) 20 *cm*, 14 *cm*

(c) 32 *cm*, 2 *cm* (d) 30 *cm*, 4 *cm*

61. In Gallilean telescope, if the powers of an objective and eye lens are respectively +1.25 *D* and – 20 *D*, then for relaxed vision, the length and magnification will be

(a) 21.25 *cm* and 16 (b) 75 *cm* and 20

(c) 75 *cm* and 16 (d) 8.5 *cm* and 21.25

62. The aperture of a telescope is made large, because **[DPMT 1999]**

(a) To increase the intensity of image

(b) To decrease the intensity of image

(c) To have greater magnification

(d) To have lesser resolution

63. In Gallilean telescope, the final image formed is

(a) Real, erect and enlarged

(b) Virtual, erect and enlarged

(c) Real, inverted and enlarged

(d) Virtual, inverted and enlarged

64. The magnifying power of a telescope is 9. When it is adjusted for parallel rays, the distance between the objective and the eye-piece is found to be 20 *cm*. The focal length of the two lenses are **[MP PMT 1986]**

(a) 18 *cm*, 2 *cm* (b) 11 *cm*, 9 *cm*

(c) 10 *cm*, 10 *cm* (d) 15 *cm*, 5 *cm*

65. The focal length of the objective and eye piece of a telescope are respectively 60 *cm* and 10 *cm*. The magnitude of the magnifying power when the image is formed at infinity is

(a) 50 (b) 6

(c) 70 (d) 5

66. The magnifying power of an astronomical telescope is 8 and the distance between the two lenses is 54 *cm*. The focal length of eye lens and objective lens will be respectively **[MP PMT 1991; CPMT 1991; Pb. PMT 2001]**

(a) 6 *cm* and 48 *cm* (b) 48 *cm* and 6 *cm*

(c) 8 *cm* and 64 *cm* (d) 64 *cm* and 8 *cm*

67. An opera glass (Gallilean telescope) measures 9 *cm* from the objective to the eyepiece. The focal length of the objective is 15 *cm*. Its magnifying power is **[DPMT 1988]**

(a) 2.5 (b) 2/5

(c) 5/3 (d) 0.4

68. When a telescope is adjusted for parallel light, the distance of the objective from the eye piece is found to be 80 *cm*. The magnifying power of the telescope is 19. The focal lengths of the lenses are **[MP PMT 1992; Very similar to DPMT 2004]**

(a) 61 *cm*, 19 *cm* (b) 40 *cm*, 40 *cm*

(c) 76 *cm*, 4 *cm* (d) 50 *cm*, 30 *cm*

69. A reflecting telescope utilizes

(a) A concave mirror (b) A convex mirror

(c) A prism (d) A plano-convex lens

70. The aperture of the objective lens of a telescope is made large so as to **[AIEEE 2003; KCET 2003]**

(a) Increase the magnifying power of the telescope

(b) Increase the resolving power of the telescope

(c) Make image aberration less

(d) Focus on distant objects

71. 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 the objective and that of the eye piece

(d) The diameter of aperture of the objective and that of the eye piece **[MP PET 1991]**

72. Large aperture of telescope are used for **[CPMT 1981; MP PMT 1995; AFMC 2000]**

(a) Large image (b) Greater resolution

(c) Reducing lens aberration (d) Ease of manufacture

73. Two convex lenses of focal lengths 0.3 *m* and

0.05 m are used to make a telescope. The distance kept between the two is

(a) 0.35 m (b) 0.25 m

(c) 0.175 m (d) 0.15 m

74. The diameter of the objective lens of a telescope is 5.0 m and wavelength of light is 6000 Å. The limit of resolution of this telescope will be **[MP PMT 1994]**

(a) 0.03 sec (b) 3.03 sec

(c) 0.06 sec (d) 0.15 sec

75. All of the following statements are correct except **[Manipal MEE 1995]**

(a) The total length of an astronomical telescope is the sum of the focal lengths of its two lenses

(b) The image formed by the astronomical telescope is always erect because the effect of the combination of the two lenses is divergent

(c) The magnification of an astronomical telescope can be increased by decreasing the focal length of the eye-piece

(d) The magnifying power of the refracting type of astronomical telescope is the ratio of the focal length of the objective to that of the eye-piece

76. A terrestrial telescope is made by introducing an erecting lens of focal length f between the objective and eye piece lenses of an astronomical telescope. This causes the length of the telescope tube to increase by an amount equal to **[KCEE 1996]**

(a) f (b) $2f$

(c) $3f$ (d) $4f$

77. The length of an astronomical telescope for normal vision (relaxed eye) (f_o = focal length of objective lens and f_e = focal length of eye lens) is **[EAMCET (Med.) 1995; CPMT 1999; BVP 2003]**

(a) $f_o \times f_e$ (b) $\frac{f_o}{f_e}$

(c) $f_o + f_e$ (d) $f_o - f_e$

78. A Gallilean telescope has objective and eye-piece of focal lengths 200 cm and 2 cm respectively. The magnifying power of the telescope for normal vision is **[MNR 1994; MP PMT 1996]**

(a) 90 (b) 100

(c) 108 (d) 198

79. In an astronomical telescope, the focal length of the objective lens is 100 cm and of eye-piece is 2 cm. The magnifying power of the telescope for the normal eye is **[MP PET 1997]**

(a) 50 (b) 10

(c) 100 (d) $\frac{1}{50}$

80. When diameter of the aperture of the objective of an astronomical telescope is increased, its **[MP PMT 199**

(a) Magnifying power is increased and resolving power is decreased

(b) Magnifying power and resolving power both are increased

(c) Magnifying power remains the same but resolving power is increased

(d) Magnifying power and resolving power both are decreased

81. The focal lengths of the objective and eye lenses of a telescope are respectively 200 cm and 5 cm. The maximum magnifying power of the telescope will be **[MP PMT/PET 1998; JIPMER 2001, 02]**

(a) – 40 (b) – 48

(c) – 60 (d) – 100

82. The minimum magnifying power of a telescope is M, If the focal length of its eye lens is halved, the magnifying power will become

(a) M / 2 (b) 2 M

(c) 3 M (d) 4 M

83. The astronomical telescope consists of objective and eye-piece. The focal length of the objective is **[AIIMS 1998; BHU 2000]**

(a) Equal to that of the eye-piece

(b) Greater than that of the eye-piece

(c) Shorter than that of the eye-piece

(d) Five times shorter than that of the eye-piece

84. Four convergent lenses have focal lengths 100 *cm*, 10 *cm*, 4 *cm* and 0.3 *cm*. For a telescope with maximum possible magnification, we choose the lenses of focal length **[KCET 1994]**

(a) 100 *cm*, 0.3 *cm* (b) 10 *cm*, 0.3 *cm*

(c) 10 *cm*, 4 *cm* (d) 100 *cm*, 4 *cm*

85. The focal length of objective and eye-piece of a telescope are 100 *cm* and 5 *cm* respectively. Final image is formed at least distance of distinct vision. The magnification of telescope is **[RPET 1997]**

(a) 20 (b) 24

(c) 30 (d) 36

86. A planet is observed by an astronomical refracting telescope having an objective of focal length 16 *m* and an eye-piece of focal length 2 *cm* **[IIT-JEE 1992; Roorkee 2000]**

(a) The distance between the objective and the eye-piece is 16.02 *m*

(b) The angular magnification of the planet is 800

(c) The image of the planet is inverted

(d) The objective is larger than the eye-piece

87. If tube length of astronomical telescope is 105 *cm* and magnifying power is 20 for normal setting, calculate the focal length of objective

(a) 100 *cm* (b) 10 *cm*

(c) 20 *cm* (d) 25 *cm*

88. The length of a telescope is 36 *cm*. The focal lengths of its lenses can be

(a) 30 *cm*, 6 *cm* (b) – 30 *cm*, – 6 *cm*

(c) 30 *cm*, – 6 *cm* (d) – 30 *cm*, 6 *cm*

89. An astronomical telescope of ten-fold angular magnification has a length of 44 *cm*. The focal length of the objective is **[CBSE PMT 1997]**

(a) 4 *cm* (b) 40 *cm*

(c) 44 *cm* (d) 440 *cm*

90. If both the object and image are at infinite distances form a refracting telescope its magnifying power will be equal to **[AMU (Engg.) 1999]**

(a) The sum of the focal lengths of the objective and the eyepiece

(b) The difference of the focal lengths of the two lenses

(c) The ratio of the focal length of the objective and eyepiece

(d) The ratio of the focal length of the eyepiece and objective

91. The number of lenses in a terrestrial telescope is **[KCET 1999; MH CET 2003]**

(a) Two (b) Three

(c) Four (d) Six

92. The focal lengths of the lenses of an astronomical telescope are 50 *cm* and 5 *cm*. The length of the telescope when the image is formed at the least distance of distinct vision is **[EAMCET (Engg.) 2000]**

(a) $45\,cm$ (b) $55\,cm$

(c) $\frac{275}{6}\,cm$ (d) $\frac{325}{6}\,cm$

93. The focal lengths of the objective and eye-piece of a telescope are respectively 100 *cm* and 2 *cm*. The moon subtends an angle of 0.5^o at the eye. If it is looked through the telescope, the angle subtended by the moon's image will be **[AFMC 1994]**

(a) 100^o (b) 50^o

(c) 25^o (d) 10^o

94. The diameter of the objective of a telescope is a, its magnifying power is *m* and wavelength of light is λ. The resolving power of the telescope is **[Bihar MEE 1995] [MP PMT 2000]**

(a) $(1.22\lambda)/a$ (b) $(1.22a)/\lambda$

(c) $\lambda m/(1.22a)$ (d) $a/(1.22\lambda)$

95. The sun's diameter is $1.4\times10^9\,m$ and its distance from the earth is $10^{11}\,m$. The diameter of its image, formed by a convex lens of focal length $2\,m$ will be **[MP PET 2000]**

(a) 0.7 *cm* (b) 1.4 *cm*

(c) 2.8 *cm* (d) Zero (*i.e.* point image)

96. In a terrestrial telescope, the focal length of objective is 90 *cm*, of inverting lens is $5\,cm$ and of eye lens is $6\,cm$ If the final image is at 30 *cm*, then the magnification will be

[DPMT 2001]

(a) 21 (b) 12

(c) 18 (d) 15

97. The resolving power of a telescope depends on

[MP PET 2000, 01; DCE 2003]

(a) Focal length of eye lens

(b) Focal length of objective lens

(c) Length of the telescope

(d) Diameter of the objective lens

98. Four lenses of focal length + 15 *cm,* + 20*cm,* + 150*cm* and + 250 *cm* are available for making an astronomical telescope. To produce the largest magnification, the focal length of the eye-piece should be

[CPMT 2001; AIIMS 2001]

(a) + 15 *cm* (b) + 20 *cm*

(c) +150 *cm* (d) + 250 *cm*

99. In an astronomical telescope, the focal length of objective lens and eye-piece are 150 *cm* and 6 *cm* respectively. In case when final image is formed at least distance of distinct vision. the magnifying power is **[KCET 2001]**

(a) 20 (b) 30

(c) 60 (d) 15

100. In a laboratory four convex lenses L_1, L_2, L_3 and L_4 of focal lengths 2, 4, 6 and 8 *cm* respectively are available. Two of these lenses form a telescope of length 10 *cm* and magnifying power 4. The objective and eye lenses are

[MP PMT 2001]

(a) L_2, L_3 (b) L_1, L_4

(c) L_3, L_2 (d) L_4, L_1

101. A telescope has an objective of focal length 50 *cm* and an eye piece of focal length 5 *cm*. The least distance of distinct vision is 25 *cm*. The telescope is focussed for distinct vision on a scale 200 *cm* away. The separation between the objective and the eye-piece is

(a) 75 *cm* (b) 60 *cm*

(c) 71 *cm* (d) 74 *cm*

102. The resolving power of a telescope whose lens has a diameter of 1.22 *m* for a wavelength of 5000 *Å* is

[Kerala PMT 2002]

(a) 2×10^5 (b) 2×10^6

(c) 2×10^2 (d) 2×10^4

103. To increase both the resolving power and magnifying power of a telescope **[Kerala PET 2002; KCET 2002**

(a) Both the focal length and aperture of the objective has to be increased

(b) The focal length of the objective has to be increased

(c) The aperture of the objective has to be increased

(d) The wavelength of light has to be decreased

104. A Galileo telescope has an objective of focal length $100\,cm$ and magnifying power 50. The distance between the two lenses in normal adjustment will be

[BHU 2002; Pb. PET 2002]

(a) 96 *cm* (b) 98 *cm*

(c) 102 *cm* (d) 104 *cm*

105. An astronomical telescope has a magnifying power 10. The focal length of eyepiece is 20 *cm*. The focal length of objective is **[MP PMT 2002, 03; Pb. P**

(a) 2 *cm* (b) 200 *cm*

(c) $\frac{1}{2}cm$ (d) $\frac{1}{200}cm$

106. A telescope of diameter 2*m* uses light of wavelength 5000 Å for viewing stars. The minimum angular separation between two stars whose image is just resolved by this telescope is

[MP PET 2003]

(a) $4\times10^{-4}\,rad$ (b) $0.25\times10^{-6}\,rad$

(c) $0.31\times10^{-6}\,rad$ (d) $5.0\times10^{-3}\,rad$

107. A simple magnifying lens is used in such a way that an image is formed at 25 *cm* away from the eye. In order to have 10 *times* magnification, the focal length of the lens should be

(a) 5 *cm* (b) 2 *cm*

[Kerala PET 2002]

(c) 25 *mm* (d) 0.1 *mm*

108. In a simple microscope, if the final image is located at infinity then its magnifying power is **[MP PMT 2004]**

(a) $\frac{25}{f}$ (b) $\frac{D}{26}$

(c) $\frac{f}{25}$ (d) $\frac{f}{D+1}$

109. In a compound microscope the objective of f_o and eyepiece of f_e are placed at distance L such that L equals **[Kerala PMT 2004]**

(a) $f_o + f_e$

(b) $f_o - f_e$

(c) Much greater than f_o or f_e

(d) Much less than f_o or f_e

(e) Need not depend either value of focal lengths

110. For a compound microscope, the focal lengths of object lens and eye lens are f_o and f_e respectively, then magnification will be done by microscope when **[RPMT 2001]**

(a) $f_o = f_e$ (b) $f_o > f_e$

(c) $f_o < f_e$ (d) None of these

111. The angular resolution of a 10 *cm* diameter telescope at a wavelength of 5000 Å is of the order **[CBSE PMT 2005]**

(a) $10^6\ rad$ (b) $10^{-2}\ rad$

(c) $10^{-4}\ rad$ (d) $10^{-6}\ rad$

112. The resolving power of an astronomical telescope is 0.2 seconds. If the central half portion of the objective lens is covered, the resolving power will be **[MP PMT 2004]**

(a) 0.1 *sec* (b) 0.2 *sec*

(c) 1.0 *sec* (d) 0.6 *sec*

113. An astronomical telescope has objective and eye-piece lens of powers 0.5 *D* and 20 *D* respectively, its magnifying power will be

(a) 8 (b) 20

(c) 30 (d) 40

114. Which of the following is not correct regarding the radio telescope **[BHU 2004]**

(a) It can not work at night

(b) It can detect a very faint radio signal

(c) It can be operated even in cloudy weather

(d) It is much cheaper than optical telescope

115. The diameter of objective of a telescope is 1*m*. Its resolving limit for the light of wave length 4538 Å, will be **[Pb. PET 2003]**

(a) $5.54 \times 10^{-7}\ rad$ (b) $2.54 \times 10^{-4}\ rad$

(c) $6.54 \times 10^{-7}\ rad$ (d) None of these

116. A telescope has an objective lens of focal length 200 *cm* and an eye piece with focal length 2 *cm*. If this telescope is used to see a 50 *meter* tall building at a distance of 2 *km*, what is the height of the image of the building formed by the objective lens

(a) 5 *cm* (b) 10 *cm*

(c) 1 *cm* (d) 2 *cm*

117. Magnification of a compound microscope is 30. Focal length of eye-piece is 5 *cm* and the image is formed at a distance of distinct vision of 25 *cm*. The magnification of the objective lens is

(a) 6 (b) 5

(c) 7.5 (d) 10

118. At Kavalur in India, the astronomers using a telescope whose objective had a diameter of one meter started using a telescope of diameter 2.54 *m*. This resulted in **[KCET 2005]**

(a) The increase in the resolving power by 2.54 times for the same λ

(b) The increase in the limiting angle by 2.54 times for the same λ

(c) Decrease in resolving power

(d) No effect on the limiting angle

119. A Galileo telescope has an objective of focal length 100 *cm* and magnifying power 50. The distance between the two lenses in normal adjustment will be **[Pb. PET 2002] [BCECE 2005]**

(a) 98 *cm* (b) 100 *cm*

(c) 150 *cm* (d) 200 *cm*

120. A compound microscope has an eye piece of focal length 10 *cm* and an objective of focal length 4 *cm*. Calculate the magnification, if an object is kept at a distance of 5 *cm* from the objective so that final image is formed at the least distance vision (20 *cm*)

(a) 12 (b) 11

(c) 10 (d) 13

Photometry

1. If luminous efficiency of a lamp is 2 lumen/watt and its luminous intensity is 42 candela, then power of the lamp is **[AFMC 1998]**

(a) 62 *W* (b) 76 *W*

(c) 138 *W* (d) 264 *W*

2. An electric bulb illuminates a plane surface. The intensity of illumination on the surface at a point 2*m* away from the bulb is 5×10^{-4} phot (*lumen/cm*^{2}). The line joining the bulb to the point makes an angle of 60^o with the normal to the surface. The intensity of the bulb in *candela* is **[IIT-JEE 1980; CPMT 1991]**

(a) $40\sqrt{3}$ (b) 40

(c) 20 (d) 40×10^{-4}

3. In a movie hall, the distance between the projector and the screen is increased by 1% illumination on the screen is **[CPMT 1990]**

(a) Increased by 1% (b) Decreased by 1%

(c) Increased by 2% (d) Decreased by 2%

4. Correct exposure for a photographic print is 10 *seconds* at a distance of one metre from a point source of 20 *candela*. For an equal fogging of the print placed at a distance of 2 *m* from a 16 *candela* source, the necessary time for exposure is

(a) 100 *sec* (b) 25 *sec*

(c) 50 *sec* (d) 75 *sec*

5. A bulb of 100 *watt* is hanging at a height of one meter above the centre of a circular table of diameter 4 *m*. If the intensity at a point on its rim is I_0, then the intensity at the centre of the table will be **[CPMT 1996]**

(a) I_0 (b) $2\sqrt{5}I_0$

(c) $2I_0$ (d) $5\sqrt{5}I_0$

6. A movie projector forms an image 3.5*m* long of an object 35 *mm*. Supposing there is negligible absorption of light by aperture then illuminance on slide and screen will be in the ratio of **[UPSEAT 2005]**

(a) 100 : 1 (b) 10^4 : 1

(c) 1 : 100 (d) 1 : 10^4

7. A 60 *watt* bulb is hung over the center of a table 4 *m* × 4 *m* at a height of 3 *m*. The ratio of the intensities of illumination at a point on the centre of the edge and on the corner of the table is **[CPMT 1976, 84]**

(a) $(17/13)^{3/2}$ (b) 2 / 1

(c) 17 / 13 (d) 5 / 4

8. "Lux" is a unit of **[Kerala PMT 2001]**

(a) Luminous intensity of a source

(b) Illuminance on a surface

(c) Transmission coefficient of a surface

(d) Luminous efficiency of source of light

9. Total flux produced by a source of 1 *cd* is **[CPMT 2001]**

(a) $\frac{1}{4\pi}$ (b) 8π

(c) 4π (d) $\frac{1}{8\pi}$

10. If the luminous intensity of a 100 *W* unidirectional bulb is 100 candela, then total luminous flux emitted from the bulb is

(a) 861 *lumen* (b) 986 *lumen*

(c) 1256 *lumen* (d) 1561 *lumen*

11. The maximum illumination on a screen at a distance of 2 *m* from a lamp is 25 *lux*. The value of total luminous flux emitted by the lamp is **[JIMPER 1997]**

(a) 1256 *lumen* (b) 1600 *lumen*

(c) 100 *candela* (d) 400 *lumen*

12. A small lamp is hung at a height of 8 feet above the centre of a round table of diameter 16 *feet*. The ratio of intensities of illumination at the

centre and at points on the circumference of the table will be [CPMT 1984, 1996]

(a) 1 : 1 (b) 2 : 1

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

13. Lux is equal to [CPMT 1993]

(a) 1 *lumen/m*^{2} (b) 1 *lumen/cm*^{2}

(c) 1 *candela/m*^{2} (d) 1 *candela/cm*^{2}

14. Five *lumen/watt* is the luminous efficiency of a lamp and its luminous intensity is 35 *candela*. The power of the lamp is [CPMT 1992]

(a) 80 *W* (b) 176 *W*

(c) 88 *W* (d) 36 *W*

15. A lamp rated at 100 *cd* hangs over the middle of a round table with diameter 3 *m* at a height of 2 *m*. It is replaced by a lamp of 25 *cd* and the distance to the table is changed so that the illumination at the centre of the table remains as before. The illumination at edge of the table becomes *X* times the original. Then *X* is

(a) $\frac{1}{3}$ (b) $\frac{16}{27}$

(c) $\frac{1}{4}$ (d) $\frac{1}{9}$

16. The distance between a point source of light and a screen which is 60 *cm* is increased to 180 *cm*. The intensity on the screen as compared with the original intensity will be [CPMT 1888]

(a) (1 / 9) times (b) (1 / 3) times

(c) 3 times (d) 9 times

17. A source of light emits a continuous stream of light energy which falls on a given area. Luminous intensity is defined as [CPMT 1986]

(a) Luminous energy emitted by the source per second

(b) Luminous flux emitted by source per unit solid angle

(c) Luminous flux falling per unit area of a given surface

(d) Luminous flux coming per unit area of an illuminated surface

18. Venus looks brighter than other stars because [MNR 1985]

(a) It has higher density than other stars

(b) It is closer to the earth than other stars

(c) It has no atmosphere

(d) Atomic fission takes place on its surface

19. To prepare a print the time taken is 5 sec due to lamp of 60 watt at 0.25 *m* distance. If the distance is increased to 40 *cm* then what is the time taken to prepare the similar print [CPMT 1982]

(a) 3.1 *sec* (b) 1 *sec*

(c) 12.8 *sec* (d) 16 *sec*

20. A lamp is hanging 1 *m* above the centre of a circular table of diameter 1*m*. The ratio of illuminaces at the centre and the edge is

(a) $\frac{1}{2}$ (b) $\left(\frac{5}{4}\right)^{\frac{3}{2}}$

(c) $\frac{4}{3}$ (d) $\frac{4}{5}$

[CPMT 1989]

21. Two stars situated at distances of 1 and 10 light years respectively from the earth appear to possess the same brightness. The ratio of their real brightness is [NCERT 1981]

(a) 1 : 10 (b) 10 : 1

(c) 1 : 100 (d) 100 : 1

22. The intensity of direct sunlight on a surface normal to the rays is I_0. What is the intensity of direct sunlight on a surface, whose normal makes an angle of 60^o with the rays of the sun

(a) I_0 (b) $I_0\left(\frac{\sqrt{3}}{2}\right)$

(c) $\frac{I_0}{2}$ (d) $2I_0$

23. Inverse square law for illuminance is valid for [CPMT 1978]

(a) Isotropic point source (b)Cylindrical source

(c) Search light (d) All types of sources

24. 1% of light of a source with luminous intensity 50 *candela* is incident on a circular surface of radius 10 *cm*. The average illuminance of surface is

(a) 100 *lux* (b) 200 *lux*

(c) 300 *lux* (d) 400 *lux*

25. Two light sources with equal luminous intensity are lying at a distance of 1.2 *m* from each other. Where should a screen be placed between them such that illuminance on one of its faces is four times that on another face

(a) 0.2 *m* (b) 0.4 *m*

(c) 0.8 *m* (d) 1.6 *m*

26. Two lamps of luminous intensity of 8 *Cd* and 32 *Cd* respectively are lying at a distance of 1.2 *m* from each other. Where should a screen be placed between two lamps such that its two faces are equally illuminated due to two sources

(a) 10 *cm* from 8 *Cd* lamp (b) 10 *cm* from 32*Cd* lamp

(c) 40 *cm* from 8 *Cd* lamp (d) 40 *cm* from 32 *Cd* lamp

27. A lamp is hanging along the axis of a circular table of radius *r*. At what height should the lamp be placed above the table, so that the illuminance at the edge of the table is $\frac{1}{8}$ of that at its center **[MP PET 2005]**

(a) $\frac{r}{2}$ (b) $\frac{r}{\sqrt{2}}$

(c) $\frac{r}{3}$ (d) $\frac{r}{\sqrt{3}}$

28. A point source of 100 *candela* is held 5*m* above a sheet of blotting paper which reflects 75% of light incident upon it. The illuminance of blotting paper is

(a) 4 *phot* (b) 4 *lux*

(c) 3 *phot* (d) 3 *lux*

29. A lamp is hanging at a height 40 *cm* from the centre of a table. If its height is increased by 10 *cm* the illuminance on the table will decrease by

(a) 10 % (b) 20%

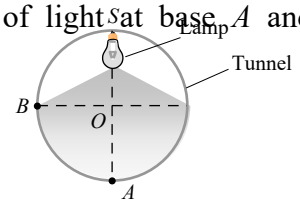
(c) 27% (d) 36%

30. Which has more luminous efficiency

(a) A 40 *W* bulb (b) A 40 *W* fluorescent tube

(c) Both have same (d) Cannot say

31. An electric lamp is fixed at the ceiling of a circular tunnel as shown is figure. What is the ratio the intensities of light at base *A* and a point *B* on the wall



(a) 1 : 2

(b) $2:\sqrt{3}$

(c) $\sqrt{3}:1$

(d) $1:\sqrt{2}$

32. When sunlight falls normally on earth, a luminous flux of 1.57×10^5 *lumen*/m^2 is produced on earth. The distance of earth from sun is 1.5×10^8 *Km*. The luminous intensity of sun in candela will be

(a) 3.53×10^{27} (b) 3.53×10^{25}

(c) 3.53×10^{29} (d) 3.53×10^{21}

33. In the above problem, the luminous flux emitted by sun will be

(a) 4.43×10^{25} *lm* (b) 4.43×10^{26} *lm*

(c) 4.43×10^{27} *lm* (d) 4.43×10^{28} *lm*

34. A screen receives 3 *watt* of radiant flux of wavelength 6000 *Å*. One lumen is equivalent to 1.5×10^{-3} *watt* of monochromatic light of wavelength 5550 *Å*. If relative luminosity for 6000 *Å* is 0.685 while that for 5550 Å is 1.00, then the luminous flux of the source is

(a) 4×10^3 *lm* (b) 3×10^3 *lm*

(c) 2×10^3 *lm* (d) 1.37×10^3 *lm*

35. A point source of 3000 *lumen* is located at the centre of a cube of side length 2*m*. The flux through one side is

(a) 500 *lumen* (b) 600 *lumen*

(c) 750 *lumen* (d) 1500 *lumen*

36. Light from a point source falls on a small area placed perpendicular to the incident light. If the area is rotated about the incident light by an angle of 60^o, by what fraction will the illuminance change

(a) It will be doubled (b) It will be halved

(c) It will not change (d) It will become one-fourth