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. 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
   (a) $m_1 - m_2$ (b) $\sqrt{m_1 + m_2}$
   (c) $(m_1 + m_2)/2$ (d) $m_1 \times m_2$

4. 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
   (a) 1.8 *cm* (b) 1.5 *cm*
   (c) 2.1 *cm* (d) 2.4 *cm*

5. 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
   (a) 200 *cm* (b) 160 *cm*
   (c) 2.5 *cm* (d) 0.1 *cm*

6. 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*)
   (a) 10 (b) 0.1
   (c) 62.5 (d) 11

7. In order to increase the magnifying power of a compound microscope
   (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

8. 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*

9. Least distance of distinct vision is 25 *cm*. Magnifying power of simple microscope of focal length 5 *cm* is
   (a) 1 / 5 (b) 5
   (c) 1 / 6 (d) 6

10. 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

11. 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
    (a) 16 : 25 (b) 9 : 1
    (c) 4 : 5 (d) 5 : 4

12. 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
    (a) $P_A > P_B$ (b) $P_A < P_B$
    (c) $P_A < 3/2 P_B$ (d) $P_A = P_B$

13. 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) $1.36 \times 10^{5} rad$

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

(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

15. 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

16. A reflecting telescope utilizes

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

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

17. The aperture of the objective lens of a telescope is made large so as to

(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

18. Large aperture of telescope are used for

(a) Large image (b) Greater resolution

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

19. All of the following statements are correct except

(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

20. 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

(a) 50 (b) 10

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

21. 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

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

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

22. 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

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

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

23. 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

(a) 21 (b) 12

(c) 18 (d) 15

24. 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

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

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

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

(a) 2×10^5 (b) 2×10^6

(c) 2×10^2 (d) 2×10^4

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

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

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

27. 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

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

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

28. 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*

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

29. 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

(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

30. 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

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

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