# The Human Eye and the Colourful World

## Assertion & Reason Type Questions

**Directions: Each of the following questions consists of two statements, one is Assertion (A) and the other is Reason (R). Give answer:**

a. Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

b. Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).

c. Assertion (A) is true but Reason (R) is false.

d. Assertion (A) is false but Reason (R) is true.

**Q1. Assertion (A):** Ciliary muscles help in changing the focal length of the eye lens.

**Reason (R):** Ciliary muscles help to focus near and distant objects in quick succession.

**Answer :** (b) Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).

**Q2. Assertion (A):** A person suffering from myopia cannot see the distant objects clearly.

**Reason (R):** A converging lens is used for the correction of myopic eye as it can form real as well as virtual images of the objects placed in front of it. **(CBSE 2023)**

**Answer :** (c) Reason (R) is false because a diverging lens or con- cave lens is used for the correction of myopic eye.

**Q3. Assertion (A):** The white light is dispersed into seven constituent colours when passed through the prism.

**Reason (R):** Different colours of light bend through different angles as they pass through a prism.

**Answer :** (a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

**Q4. Assertion (A):** The planets twinkle while the Stars do not.

**Reason (R):** The planets are much closer to the Earth than the Stars.

**Answer :** (d) Assertion (A) is false because planets do not twinkle while stars twinkle.

**Q5. Assertion (A):** The rainbow is seen when the Sun is behind the observer.

**Reason (R):** Rainbow is produced due to dispersion of white light by small rain drops hanging in the air after the rain.

**Answer :** (b) Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).

Just after the rain, a large number of small droplets of water remain suspended in the air. Each drop acts like a small prism. When sunlight fall on these drops the white light splits into seven colours. The dispersed light from a large number of drops forms a continuous band of seven colours.

**Q6. Assertion (A):** The Sun is visible to us about 2 minutes before the actual sunrise and about 2 minutes after the actual sunset because of atmospheric refraction.

**Reason (R):** The time difference between actual sunset and the apparent sunset is about 4 minutes.

**Answer :** (c) Reason (R) is false because the time difference between actual sunset and apparent sunset is 2 minutes.

**Q7. Assertion (A):** The scattering of longer wavelengths of light increases as the size of the particles increases.

**Reason (R):** Large particles scatter lights of all wavelengths equally well.

**Answer :** (b) Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).

**Q8. Assertion (A):** The scattered light makes path of light visible.

**Reason (R):** Scattering of light is the result of Tyndall effect.

**Answer :** (b) Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).

**Q9. Assertion (A) :** White light is dispersed into its seven-colour components by a prism.

**Reason (R) :** Different colours of light bend through different angles with respect to the incident ray as they pass through a prism.

**Answer :** (a)

**Q10. Assertion (A) :** The phenomenon of scattering of light by the colloidal particles gives rise to Tyndall effect.

**Reason (R) :** The colour of the scattered light depends on the size of the scattering particles.

Answer : (b)

**Q11. Assertion (A) :** A normal human eye can clearly see all the objects beyond certain minimum distance.

**Reason (R) :** The human eye has capacity of adjusting the focal length of eye lens.

Answer : (a)

**Q12. Assertion (A) :** A rainbow is sometimes seen in the sky in rainy season only when observer's back is towards the Sun.

**Reason (R) :** Internal reflection in the water droplets cause dispersion and the final rays are in backward direction.

Answer : (a)

**Q13. Assertion (A) :** Myopia is the defect of the eye in which only nearer objects are seen by the eye.

**Reason (R) :** The eye ball is elongated.

Answer : (a)

**Q14. Assertion (A) :** Hypermetropia is the defect of the eye in which only farther objects are seen.

**Reason (R) :** Hypermetropia is corrected by using converging lens.

Answer : (b)

**Q15. Assertion (A) :** Danger signals are made of red colour.

**Reason (R) :** Velocity of red light in air is maximum, so signals are visible even in dark.

Answer : (c)

**Q16. Assertion (A) :** The sky looks dark and black instead of blue in outer space.

**Reason (R) :** No atmosphere containing air in the outer space to scatter sunlight.

Answer : (a)

**Q17. Assertion (A) :** The stars twinkle, while the planets do not.

**Reason (R) :** The stars are much bigger in size than the planets.

Answer : (b)

**Q18. Assertion (A) :** The Sun appears flattened at sunrise and sunset.

**Reason (R) :** The apparent flattering of the Sun's disc at sunrise and sunset is due to atmospheric refraction.

Answer : (a)

**Q19. Assertion (A) :** Blue colour of sky appears due to scattering of blue colour.

**Reason (R) :** Blue light has longer wavelength.

Answer : (c)