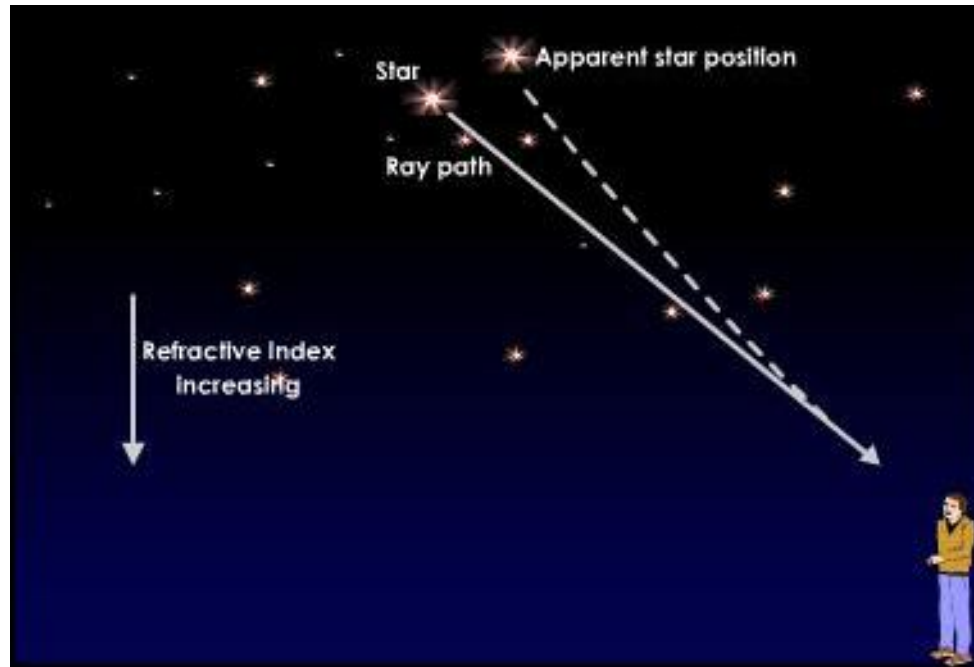


CASE STUDY QUESTION 26

Read the following and answer any four questions from (i) to (v)

The twinkling of a star is due to atmospheric refraction of starlight. The starlight on entering the earth's atmosphere, undergoes refraction continuously before it reaches the earth. The atmospheric refraction occurs in a medium of gradually changing refractive index. Since the atmosphere bends starlight towards the normal, the apparent position of the star is slightly different from its actual position. The star appears slightly higher than its actual position when viewed near the horizon. Further this apparent position of the star is not stationary, but keeps on changing slightly, since the physical conditions of the earth's atmosphere are not stationary. Since the stars are very distant they are approximate point-sized source of light. As the path of rays of light coming from the star goes on varying slightly, the apparent position of the star fluctuates and the amount of starlight entering the eye flickers the stars sometimes appear brighter and at some other time, fainter, which is the twinkling effect.



- (i) The stars seem higher than they actually are due to :
- (a) Reflection of light (b) Refraction of light (c) Scattering of light (d) Interference of light

Ans: (b) Refraction of light

(ii) Stars appear to twinkle because of :

(a) Atmospheric refraction (b) Movement of air (c) Both (a) and (b) (d) None of these

Ans: (c) Both (a) and (b)

(iii) At noon the Sun appears white as :

(a) Light is least scattered

(b) All the colours of the white light are scattered away

(c) Blue colour is scattered the most

(d) Red colour is scattered the most

Ans: (a) Light is least scattered

(iv) Which of the following phenomena of light is involved in the formation of rainbow?

- (a) Reflection, refraction and dispersion
- (b) Refraction, dispersion and total internal reflection
- (c) Refraction, dispersion and internal reflection
- (d) Dispersion, scattering and total internal reflection

Ans: (c) Refraction, dispersion and internal reflection

(v) Which of the following statements is correct regarding the propagation of light of different colours of white light in air?

- (a) Red light moves with the fastest speed
- (b) Blue light moves faster than green light
- (c) All the colours of the white light move with the same speed.
- (d) Yellow light moves with the mean speed as that of the red and the violet light

Ans: (c) All the colours of the white light move with the same speed.