

## Long Answer Questions

**Q.1. How does the earth's one revolution affect months and seasons?**

**Ans.**

- i. The Earth takes about 365 days and 6 hours to complete one revolution.
- ii. In order to avoid the confusion and problem arising out of the fraction it was decided that a day would be added to the calendar every year in the month of February and for this every fourth year is called "*Leap Year*".
- iii. This time taken by the earth for completing a revolution, actually determines the length of the seasons, let's say summer, autumn, winter and spring seasons.

**Q.2. Examine the concept of summer solstice.**

**Ans.** The line which separates the darkened portion and the illuminated one is called "*Circle of Illumination*".

On June 21, the northern half of the earth is inclined towards the sun and southern half is away from it. The sun rays fall vertically on the Tropic of Cancer ( $23\frac{1}{2}^{\circ}$  N) due to which the Northern Hemisphere becomes extremely hot and warm. There is high temperature condition in the Northern Hemisphere and it is due to the two facts. Firstly, inclination of earth's axis and secondly, direct angle of sun rays at the Tropic of Cancer.

It is summer season and the days are longer and nights are shorter in the north of the equator. Whereas in the south, the sun rays can reach up to only Antarctica circle ( $66\frac{1}{2}^{\circ}$  S), after that there is complete darkness for six months.

**Q.3. Examine the concept of winter solstice.**

**Ans.** On December 22, (slight variation in date from year to year) due to inclination southern half of the earth faces the sun. This is the situation just opposite to that of the summer solstice. More area of the Southern Hemisphere is facing the sun hence it is summer season and less area of the northern hemisphere is exposed to the sun so it is winter season. These sun rays are vertical at Tropic of Capricorn ( $23\frac{1}{2}^{\circ}$  S) due to which maximum heating takes place over that region ( $23\frac{1}{2}^{\circ}$  N) only after that its complete darkness or night for six months. Now the days are longer and nights are shorter in this hemisphere and vice versa for Northern Hemisphere where sun's rays can reach up to Arctic Circle only.

**Q.4. How are days and nights caused by the rotation of the earth?**

**Ans.** Days and nights are caused by the rotation of the earth on its axis which is tilted at about  $66\frac{1}{2}^{\circ}$  to the plane of the ecliptic or orbit. Due to this inclination the whole world experiences the unequal length of days and nights. From March 21 to June 21 the days are longer in the northern hemisphere and vice-versa in the south of the Equator.

From June 21 to September 23, the phenomena starts reversing, that is, day starts becoming shorter in Northern Hemisphere and longer in the Southern Hemisphere. On September 23, day and night become equal and after this date till 22nd December, the day length in northern hemisphere goes on decreasing and in southern hemisphere, it goes on increasing. In this way again the pattern is reversed. After December 22, the day length starts increasing with the approaching of spring equinox.