

## Very Short Answer Questions

**Q.1. What is a circle of illumination?**

**Ans.** The circle that divides the day from night on the globe is called the circle of illumination.

**Q.2. What is an axis?**

**Ans.** The imaginary line which passes from the centre of the earth and joins the two poles namely North Pole and South Pole is known as axis.

**Q.3. How are eclipses important?**

**Ans.** They give us vital information about day and night and help youngsters to develop new ideas.

## Short Answer Questions

**Q.1. How does rotation affect the earth?**

**Ans.**

- i. It is because of the rotation that days and nights take place.
- ii. Half of the earth receiving sunlight experiences day and the other half night.
- iii. This alternate day and night phenomenon keeps going on over time. These days and nights are not equal in all parts of the world.
- iv. It is attributed to the inclination of the earth that day and night is of equal length at the equator and unequal as we move towards the pole.
- v. Again, here we can refer to the fact that the earth is inclined to the plane of its orbit ( $66\frac{1}{2}^\circ$ ) which makes one of the hemispheres to lean against the sun for a greater period, let's say six months.

**Q.2. How does earth's revolution take place?**

**Ans.**

- i. Another type of movement is earth's revolution around the sun.
- ii. This movement is called revolution.
- iii. The path followed by earth to make one revolution round the sun is called orbit of the Earth.
- iv. The Earth revolves round the sun in an elliptical orbit and hence takes about 365 days and 6 hours for completing one revolution.
- v. In this way, we can say that earth has two kinds of motions: one is rotation (on its axis) and another is revolution (around the sun).

**Q.3. What would happen if the Earth did not rotate?**

**Ans.**

- i. The portion of the earth facing the sun would always experience day, thus bringing continuous warmth to the region.
- ii. The other half world remains in darkness and be freezing cold all the time.
- iii. Life would not have been possible in such extreme conditions.

## 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 ( $23\ 1\ 2\ 0\ S$ ) due to which maximum heating takes place over that region ( $23\ 1\ 2\ 0\ N$ ) 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.

## HOTS (Higher Order Thinking Skills)

### Q.1. How is the earth's axis inclined? What is its effect?

**Ans.** The earth's axis is inclined to the earth's orbit at an angle of about  $66\frac{1}{2}^{\circ}$ . Also, earth makes an angle of  $23\frac{1}{2}^{\circ}$  from a line perpendicular to the plane of the orbit. It takes about 24 hours for earth to complete one rotation. The direction of rotation is west to the east. The Sun, moon and stars rise from the east and set in the west.

At any given point of time half of the earth faces the sun while half remains in dark or away from the sun. That illuminated part is called "Circle of Illumination".

### Q.2. How does elliptical orbit of the earth affect it?

**Ans.**

- i. On 21st June, the northern hemisphere is tilted towards the sun.
- ii. The rays of the sun fall directly on the Tropic of Cancer. As a result, we receive heat. So they experience summer.
- iii. At the same time in the Southern Hemisphere, all these conditions are reversed. It is winter season there.
- iv. The nights are longer than the days here.
- v. So, a year is usually divided into summer, winter, spring and autumn seasons. Seasons change due to the change in the position of the earth around the sun.