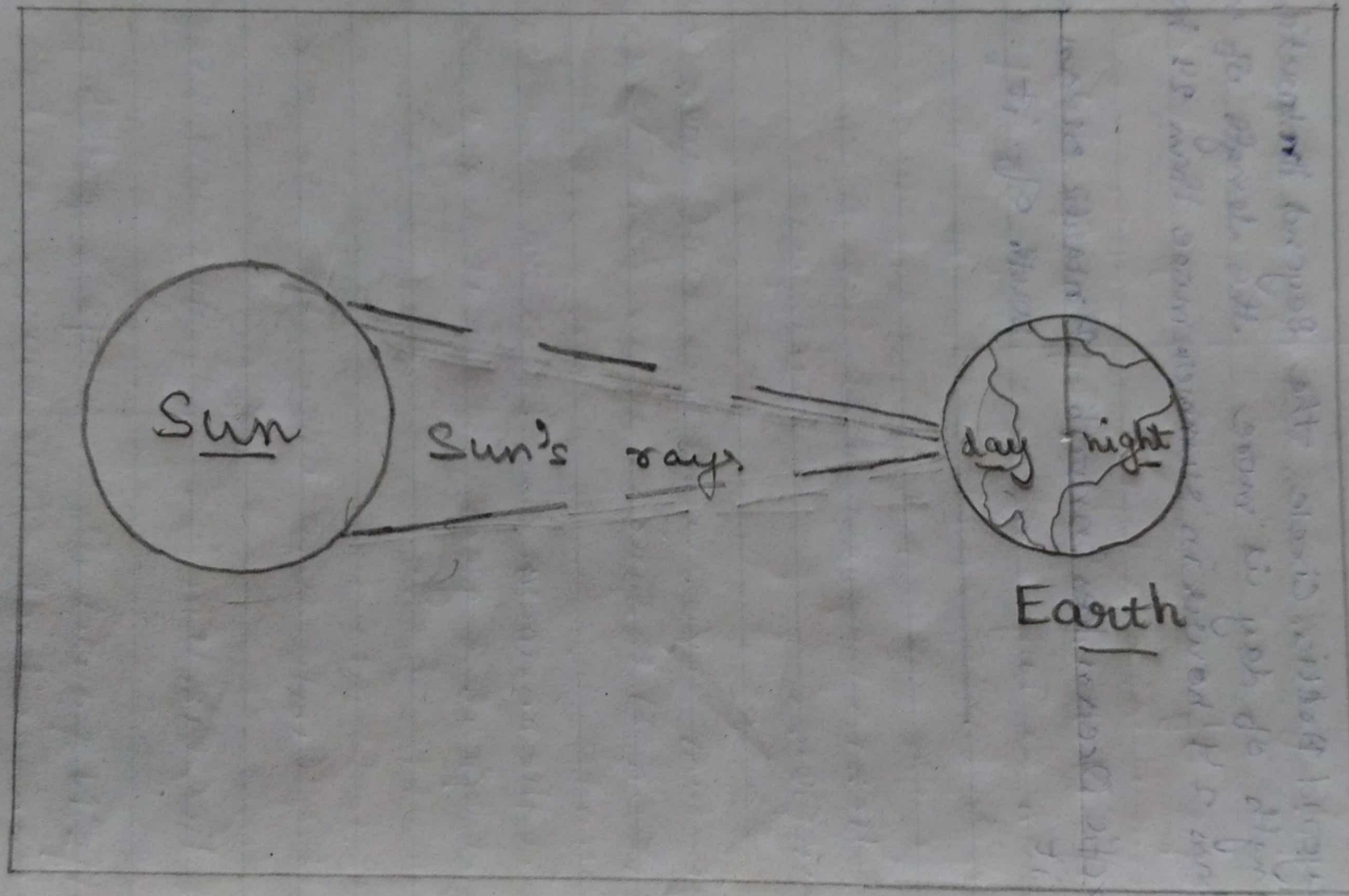

Formation of day and night

Ch-Rotation of the Earth

Q/A

1) How days and nights are formed? Explain with diagram.

A:- The Earth rotates around its axis from west to east once in 24 hours (23 hours 56 minutes 4 seconds). So when a particular place comes in front of the Sun, it gets the sunlight and therefore experience day. As the earth rotates, this particular place moves away from the Sun into darkness. In this way all places on the Earth's surface continously experience ~~period~~ periods of daylight followed by periods of darkness called night.

2) What are the types of movements of the Earth?

A:- The Earth has two main motion or movements :-

1. Rotation
2. Revolution

3) What is Rotation and Revolution?

A:- Rotation :- The earth rotates on its axis from west to east in front of the Sun once in 24 hours (23 hours 56 minutes 4 seconds). The spinning of the Earth is termed as rotation. The rotation is called 'diurnal motion' of the Earth as it causes formation of day and night. This diurnal movement is also known as 'the daily movement of the Earth'.

Revolution :- The Earths revolves around the Sun on its elliptical orbit in 365 days 5 hours 48 minutes and 5 seconds are called revolution or anular motion of the Earth. It causes seasons.

4) What is Axis?

A:- The axis is the imaginary line passing through the centre of the Earth on which the Earth rotates.

5. Why do we not feel the Rotation of the Earth?

A:- We do not feel that the Earth on which we live because it is contantly rotating. The reasons are —

(ii) There are no heavenly objects nearer to the Earth, either stationary or moving opposite of the Earth's rotation by which we can compare the Earth's rotation.

(iii) The rate of rotation is uniform and contant for each place on the Earth's surface.

(iii) The atmosphere also rotates with the Earth uniform

6) What are the effects of the speed of Rotation?

A:- The differences in the speed of rotation at the Equator and at the poles has important consequences

(ii) It affects the shape of the Earth: The rotation of the Earth is considered responsible for the slight flattening of the Earth at the two poles and bulging at the equator. The equatorial diameter is 43 km longer than the polar diameter.

(iii) It affects the general circulation of the atmosphere and ocean currents:-

(a) The moving air and ocean water in deflected at the right in the northern hemisphere and to the left in southern hemisphere.

(b) Cyclones and anticyclones are similarly deflected in both hemisphere

(c) The movements of water in the ocean is affected in relation to rigid crust.

7) What are the effects of Rotation? Explain any two of them.

A:- The rotation of the Earth is responsible for the following major effects:

1) Formation of days and nights, 2) Occurence of sunrise, noon, and sunset, 3) Determination of time, 4) Deflection of planetary wind, 5) Formation of tides 6) Magnetization of the Earth, 7) Differentiation of temperature, 8) Determination of the Direction, 9) Different local time, 10) Shape of the Earth.

Determination of time - The Earth takes a full day to make a complete rotation. We divide the day in 24 hours (23 hours 56 minutes and 4 seconds) and then an hour in 60 minutes and a minute into 60 seconds. Thus we get an idea of calculating time.

Deflection of planetary wind - In 1835, Gustave, Gaspard de Coriolis explained that air flows do not move in a straight path because the spinig of the Earth on its axis causes the air masses to get deflected. The tendency of deflection of wind due to the Earth's rotation is known as the Coriolis effects or the Coriolis force. After investigation and analysing the Coriolis force, this concept was developed by the American climatologist William Ferriel in 1855. According to Ferriel, due to the effect of Coriolis force, wind and ocean currents are deflected towards the right in the northern hemisphere and towards the left in the southern hemisphere. This is known as Ferriel's law.

8) Write short notes on :—

a) Shadow Circle :- As the earth is a sphere, only half of it, facing the Sun, is lit-up by sunrays. The other half remains dark. As a result day occurs in the lit-half and night in the dark-half of the Earth. The imaginary line that separates the lighted from the darkened half is known of the circle of illumination or shadow circle.

b) Dawn :- The period of receiving refracted and reflected sunlight before sunrise is called dawn.

c) Twilight :- The period between sunset and complete darkness is called Twilight.

d) Coriolis force :- The tendency of deflection of wind due to the Earth's rotation is known as the Coriolis effects or the Coriolis force.

e) Ferrel's Law :- After investigation and analysing the Coriolis force this concept was developed by the American climatologist William Ferrel in 1855.

According to Ferrel, due to the effect of Coriolis force, wind and ocean currents are deflected toward the right in the northern hemisphere and towards the left in the southern hemisphere. This is known as Ferrel's Law.

f) I.D.L: 180° is the same longitude which is numbered as 180°E and 180°W. This longitude is just opposite to that of the Greenwich Meridian [0°] A peculiar situation arises at 180° long. The International Date Line may be defined as an imaginary line Drawn almost along 180° meridian extending from the north pole to the south Pole from which each new date starts and each date ends at last.

g) Local time :- The local time of a place is the time of its own meridian. The local time is calculated by the position of the sun at noon at a given place. When the sun at any place is highest in the sky, it is noon and it is 12 o'clock. All the watches of that place should be set according to that time.

9) Why is the I.D.L not straight?

A:- The International Date Line passes through the Pacific Ocean. It deviate 180° longitude in some places in order to keep all the islands under one administration on one side of the Date Line. The Date line goes zigzag in some places to avoid land and to leave island groups wholly on the same side of the line. The Date Line deviates eastwards in the Bering Straits between Alaska and Siberia. The Line deviates westwards (7°) of 180° longitude to include the entire Aleutian islands to the east of the line. Further south, the Date line deviates eastwards (11°) of 180° around Fiji and Tonga islands. These islands keep the same date as New Zealand.

10) What do you know about the duration twilight?

A:- The duration of twilight at a place depends on the path of the Sun in the sky.

(i) In the low latitudes, where the sun's path is almost vertical, the duration of twilight is short. The sun sinks below the horizon rapidly.

(ii) In the middle and high latitudes, where the sun has an inclined path at a low angle, the duration twilight is long.