Geography – Part 2

1] Rotation and Revolution Of Earth Notes

Notes

- The earth is always in motion. It has many movements. Rotation on its own axis and revolution around the sun are two important movements of the earth.
- The earth takes approximately 23 hours and 56 minutes from one rotation on its axis. This movement is called rotation. It causes day and night.
- All parts of the earth do not experience day and night at the same time.
- Aryabhatta was an Indian astronomer who explained scientifically that the earth rotates on its own axis.
- The earth not only rotates on its axis but it also revolves around the sun in an elliptical orbit. The earth spins at a speed of 1670km/hr. Each planet rotates on its axis and also revolves around the sun.
- The duration taken by the earth to complete one revolution is called a year. A year consists of 365.24 days.
- The earth is inclined at an angle of $23\frac{1}{2}^{o}$ from its vertical axis. This inclination causes seasonal changes.
- The earth does not exactly take 365 days to complete one revolution around the sun. Its takes approximately 365.25 days to complete one revolution.

- There are 4 seasons according to the world calendar i.e Spring , Autumn , summer and winter.
- There are 6 seasons according to the Tamil calendar i.e Spring , Summer , Monsoon , Autumn , Winter , Prevernal.
- Pope Gregory said that it is not enough to divide the years 1800 , 1900 , 2000 by 4 it should also be divided by 400 .But other than the years ending with thousand can be divided by 4 is enough. In a leap year February has 29 days.
- During July the earth is far away from sun and in January it is very close to the sun.
- On March 21st and September 23rd the duration of day and night is equal throughout the earth. Hence they are called equinoxes.
- March 21st is referred as spring equinox and September 23rd is referred as Autumnal equinox.
- The Earth completes one “rotation” every twenty-four hours. A rotation is when the planet spins around once.
- The Earth rotates counterclockwise; this is why the Sun “rises” in the East and “sets” in the West.
- Polaris is also known as the “North Star” since it is directly above the Earth’s axis. Since this star is directly above the Earth’s axis, it does not appear to move, however the rest of the stars in the sky move around Polaris.

- On 21st June, the Northern Hemisphere is tilted towards the sun. The rays of the sun fall directly on the Tropic of Cancer. As a result, these areas receive more heat. The areas near the poles receive less heat as the rays of the sun are slanting.
- The North Pole is inclined towards the sun and the places beyond the Arctic Circle experience continuous daylight for about six months. Since a large portion of the Northern Hemisphere is getting light from the sun, it is summer in the regions north of the equator.
- The longest day and the shortest night at these places occur on 21st June. At this time winter season occurs in the Southern Hemisphere.
- On 22nd December, the Tropic of Capricorn receives direct rays of the sun as the South Pole tilts towards it.
- As the sun's rays fall vertically at the Tropic of Capricorn (23½° S), a larger portion of the Southern Hemisphere gets light. Therefore, it is summer in the Southern Hemisphere with longer days and shorter nights.
- The Earth revolves around the Sun once every 365.25 mean solar days. The Earth orbits the Sun at a speed of 108,000 km/h. Earth's perihelion(147,098,074 km) occurs around January 3, and the aphelion around July 4 (152,097,701 km)

The Arctic Circle

- The Arctic Circle is located at approximately 66.5 degrees north latitude, or 66.5 degrees north of the equator.
- This circle of latitude stretches through eight countries, including the United States, Canada, Greenland, Iceland, Norway, Sweden, Finland and Russia.
- The Arctic Circle marks the beginning area where the sun will not rise during winter solstice and will not set during summer solstice.

The Antarctic Circle

- The Antarctic Circle is located at approximately 66.5 degrees south latitude, or 66.5 degrees south of the equator.
- This line, or circle, of latitude marks the start of the southern area known as the Antarctic. The circle consists of only one continent, Antarctica.
- There are not any humans within the boundaries of the Antarctic Circle that can be considered permanent residents of the area.

The Equator

- Possibly the most well-known circle of latitude is the line sitting at zero degrees latitude, the equator.

- The equator circles the globe with a circumference of nearly 25,000 miles, dividing the northern and the southern hemispheres.
- This line of latitude is the starting point when referring to other points of the globe in terms of degrees north and degrees south.

The Tropic of Cancer

- The Tropic of Cancer is located at approximately 23.5 degrees north latitude, or 23.5 degrees north of the Equator.
- This line of latitude is the northern boundary of the area referred to as the tropics.
- During the summer solstice the sun is located immediately above the Tropic of Cancer.
- This line is the point farthest to the north at which the sun is hanging directly upward at noon.

The Tropic of Capricorn

- The Tropic of Capricorn is located at approximately 23.5 degrees south latitude, or 23.5 degrees south of the equator.
- This line of latitude is the southern boundary of the area referred to as the tropics.

- This line marks the point farthest to the south at which the sun is hanging directly upward at noon.
- During the summer solstice of the Southern Hemisphere, the sun is located immediately above the Tropic of Capricorn.
- Greenwich is on longitude 0° and any point on the line going from North pole to the South pole via Greenwich is on longitude 0°.
- The Prime Meridian divides the globe into Eastern and Western hemispheres, just as the equator divides the globe into Northern and Southern hemispheres.
- The Prime Meridian is at 0 degrees longitude, just as the equator is at 0 degrees latitude.
- The meridian that runs through Greenwich, England, is internationally accepted as the line of 0 degrees longitude, or prime meridian.
- The antimeridian is halfway around the world, at 180 degrees.
- Zero degrees latitude is the line designating the Equator and divides the Earth into two equal hemispheres (north and south).
- Zero degrees longitude is an imaginary line known as the Prime Meridian.

Latitude and Longitude

- Longitude and latitude are like X/Y coordinates (absciss, ordinate) but on the Earth sphere. So any place on Earth can be pinpointed using its latitude (North/South value) and longitude (West/East value) coordinates.
- A point's coordinate is measured in degrees because it is the angle between the agreed reference (Equator for latitude / Greenwich for longitude) and this point, viewed from the center of Earth.

Latitudes

- Latitudes are imaginary lines drawn on the globe (model of the earth) which are full circles and run in east-west direction.
- Equator is the most important latitude which divides the globe into two equal halves : Northern Hemisphere and Southern Hemisphere. It is the biggest latitude.
- Equator is 0° latitude. In the north of 0°Latitude, there are 90 latitudes and in the south also 90 latitudes are marked.
- Latitude is the North/South value of a point on Earth. Any point on the Equator's circle is of latitude 0°, the top north is 90° North, the top south is 90° South.
- Circles parallels to the Equator are of the same latitude.All latitudes are marked parallel to each other so they are also called parallels.

- The gap between two degrees is divided into 60 minutes. It is marked with (') sign.

Longitudes

- Longitudes are imaginary lines on the globe that run from North Pole to South Pole. Prime Meridian is 0° longitude.
- In the east of 0°, there are 179 important longitudes or meridians and in the west also 179 longitudes are marked.
- Longitude is the West/East value of a point on Earth. Longitudes are lines going from south pole to north pole.
- Greenwich is on longitude 0° and any point on the line going from North pole to the South pole via Greenwich is on longitude 0°.
- So there are total 360 important longitudes on globe.
- The longitude divides india at $82^0 30^{"}$.
- During rotation it takes 4 minutes to cross 1^0 longitude.