For XAT , CMAT , SNAP , MAT , IIFT Exam

THE EARTH

- Pythagoras (582-507 B.C.) believed that the Earth was a sphere. The first to suggest that the earth was shaped like a globe.
- The earth has two basic movements: 1) Rotation and 2) Revolution.

ROTATION OF EARTH

- The earth completes one rotation in 23 hours, 56 minutes and 4.09 seconds. It rotates in an eastward direction opposite to the apparent movement of the sun
- The earth's axis is tilted at an angle of 23½q from a perpendicular to the elliptic plane
- The velocity of earth's rotation varies depending on the distance of a given place from the equator. The rotational velocity at the poles is nearly zero. The greatest velocity of the rotation is found at the equator

Effects of earth's rotation

- The apparent rising and setting of the sun is actually caused by the earth's rotation which results in the alternate occurrence of day and night everywhere on the earth's surface
- Rotation of the earth is also responsible for the difference in time between different places on the earth
- Rotation causes the working of the Coriolis force which results in the deflection of the winds and the ocean currents from their normal path
- Tide is caused by the rotation of the earth apart from the gravitational pull of the sun and the moon

REVOLUTION OF THE EARTH

- The movement of the earth in its orbit around the sun in an anti-clockwise direction, that is, from west to east is called revolution of the earth
- The period taken by the earth to complete one revolution around the sun is 365 days and 6 hours
- The distance of the earth from sun varies time to time due to the elliptical shape of the orbit
- January 3rd the earth is closest to the sun and it is said to be at **Perihelion**. At Perihelion, the distance is 147 million km
- July 4th the earth is farthest from the sun and it is said to be at **Aphelion**. At Aphelion the distance of the earth is 152 million km away from the sun

Effects of revolution of the earth

The revolution of earth results

- Cycle of seasons,
- Variation in length of days and nights,
- Variation in distribution of solar energy over the earth and the temperature zones

SEASONS

- The seasons are caused due to the combined effect of the earth's revolution and the tilt of its axis in the same direction throughout the year
- The four seasons are spring, summer, autumn and winter

- The earth is moving around the sun on its tilted axis. It varies when observed on a daily and monthly basis, at different times of the year. On 21 March and 23 September the sun rises precisely in the east and sets exactly in the west

EQUINOXES

- During the equinoxes the periods of day light and darkness are equal all over the world. It happens on two days of the year 21 march and 23th September
- On 21 March the sun is directly overhead at the equator. This position of the sun is called spring equinox
- On 23 September the sun is directly overhead on the equator and it is called autumn equinox

SOLSTICE

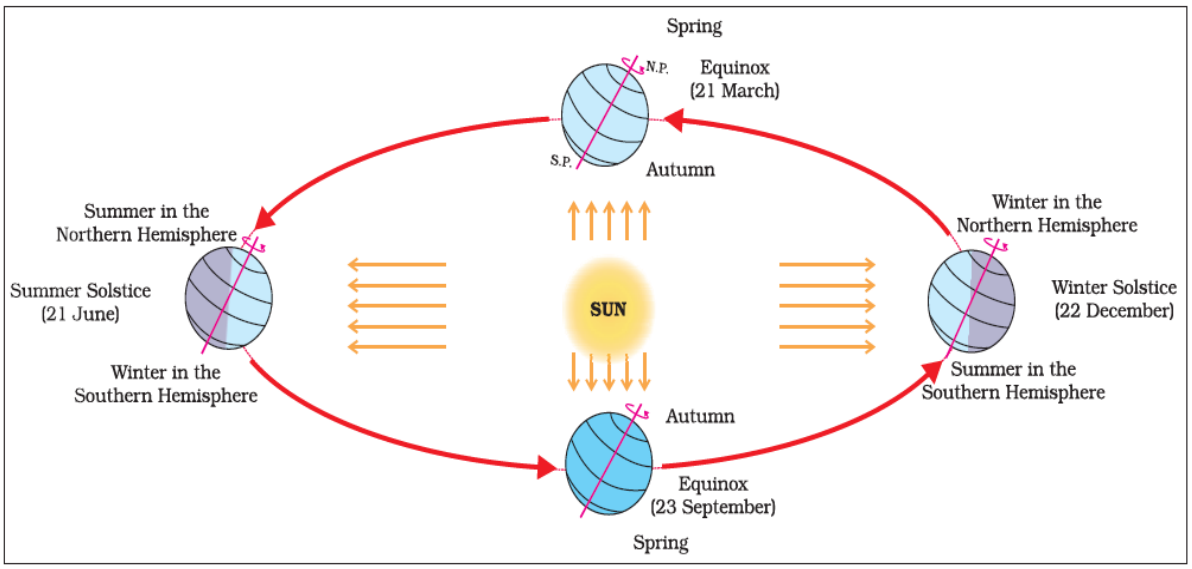
- Solstice is one of the two dates in the year on which the sun reaches greatest altitude north or south of the equator and is directly overhead along one of the lines of the tropics

SUMMER SOLSTICE

- On June 21 the earth is so located in its orbit that the sun is overhead on the tropic of cancer (23½º N). The day 21 June is known as summer solstice
- On this date the northern hemisphere is tipped towards the sun having the longest day. While southern hemisphere is tipped away from the sun having the shortest day
- On that day the North Pole is inclined or tilted towards the sun. It, therefore, experiences complete light for 24 hours. The South Pole is tilted away from the sun so it is in complete darkness for 24 hours.

WINTER SOLSTICE

- The sun is overhead on the tropic of Capricorn (23½º S).The day December 22 is known as winter solstice
- The greater part of the southern hemisphere gets the direct rays of the sun so the days are long and the nights are short here. In the northern hemisphere the nights are longer than the days at this time. The southern hemisphere has summer. The northern hemisphere has winter



EARTHY POSITION WITH RESPECT TO MOON

Apogee	Perigee
The period of the farthest distance between the moon and the earth is called apogee	The period of the nearest distance between the moon and the earth is called perigee

ECLIPSES

- An eclipse is a complete or partial obscuration of light from a celestial body and it passes through the shadow of another celestial body. The eclipses are of two types. They are:

Lunar eclipses	**Solar eclipses**
It is the situation when the earth comes between sun and moon	It is the situation when the moon comes between sun and earth
It occurs only on a full moon day. But it does not occur on every full moon day because the moon is so small and the plane of its orbit is tilted about 5 degree with respect to the earth's orbital plan	It occurs only on a New Moon day. But it does not occur on every new moon day because of the inclination of the moon's orbital plan

LATITUDE AND LONGITUDE

LATITUDE

- Latitude is the angular distance of a point on earth surface from the centre of earth. They are measured in degrees.
- The latitude specifies a location's distance north or south of the equator

Important Parallels of Latitudes

- Tropic of Cancer (23½° N) in the Northern Hemisphere
- Tropic of Capricorn (23½° S) in the Southern Hemisphere
- Arctic Circle at 66½° north of the equator
- Antarctic Circle at 66½° south of the equator

Equator

- Equator is an imaginary line running on the globe that divides it into two equal parts.
- Northern half of the earth is known as the Northern Hemisphere and Southern half is known as the Southern Hemisphere.

LONGITUDES

- Longitude is the angular distance of a point on the earth surface along the equator, east or west from the prime meridian
- The semi-circles running from pole to pole or from north to south are known as meridians of longitude and distance between them is measured in degrees of longitude
- Prime meridian is the semi-circle from pole to pole, from which all the other meridians radiate east wards and west wards up to 180
- The time at 0° longitude is called Greenwich Mean Time. It is based on local time of the meridian passing through Greenwich near London
- 180 degree meridian (International date line) is exactly opposite to the prime meridian
- Indian government has accepted the meridian of 82.5 degree east for standard time, which is 5 hours 30 minutes ahead of the Greenwich Mean time
- The International Date Line running over the Pacific Ocean

LITHOSPHERE

- The lithosphere is the outermost rigid rocky shell of the earth. It comprises the crust and the upper portion of the mantle
- The earth is composed of lithosphere, atmosphere, hydrosphere, and biosphere
- The lithosphere is the solid outer part of the Earth.
- The atmosphere is a thin layer of gases that surrounds the Earth.

- The hydrosphere is the watery part of the Earth’s surface including oceans, rivers, lakes and water vapour
- The biosphere is the layer of Earth where life exists