1) Latitude and longitude

i) Latitude and longitude are imaginary lines that used to determine the location of a place on earth.

ii) The shape of the Earth is 'Geoid'. And the location of a place on the Earth can be mentioned in terms of latitude and longitude.

iii) Example: The location of India - The longitudenal extent of India is 68 degrees 7'E and 97 degree 25'E whereas the latitudinal extent of India is 8° degree 4'N and 36 degrees 7'N.

2) Latitude (The parallels of latitude refer to the angular distance, in degrees, minutes and second of a point north or south of the Equator. Lines of latitude are often referred to as parallels.)

A) Important parallels of latitudes.

i) Besides the Equator (0°), the north pole (90°N) and the south pole (90°S), there are four important parallels of latitudes —

* Tropic of cancer (23½°N) in Northern hemisphere.
* Tropic of Capricorn (23½°S) in the Southern hemisphere.
* Artic circle at (66½° North) of the Equator.
* Antartic circle at (66½° South) of the equator.

B) Latitudinal heat zones of the Earth.

TORRID ZONES

Ans- The mid-day sun is exactly overhead at least once a year on all the latitudes in between the Tropic of Cancer and Tropic of capricorn.

TEMPERATE ZONE

Ans- The areas bounded by the Tropic of Cancer and Artic circle in the northern hemisphere, and the

Tropic of capricorn and the Antartic Circle in the southern hemisphere, have moderate temperatures.

FRIGID ZONES

Ans- Areas lying between the Arctic circle and the North pole in northern hemisphere and the Antartic circle and the south pole in the southern hemisphere, are very cold. It is because here the sun does not raise ~~such~~ much above the horizon.

3) **LONGITUDE** (Longitude refer to the angular distance, in degrees, minutes, and second, of a point east or west of the prime meridian (Greenwich). Lines of longitude are often referred to as meridians)

A) **Longitude and time**

* Since the Earth makes one complete revolution of 360° in one day or 24 hours, it passes through 15° in ~~one~~ hour or 1° in 4 minutes.
* The Earth rotates from west to East, so Every 15° we go eastwards, the local time is advanced by 1 hour. Conversely, if we go eastwards, local time is retarded by 1 hour.

* We may thus conclude that places of East of Greenwich see the sun earlier and gain time, whereas places of west of Greenwich see the sun later and lose time.

B) STANDARD TIME AND TIME ZONE

i) To avoid all these difficulties, a system of standard time is observed by all countries.

ii) Most countries adopt their standard time from the central meridian of their countries.

iii) In larger countries such as Canada, USA, China and USSR, it would be inconvenient to have single time zone. So these countries have multiple time zones.

iv) Both canada and USA have five time zones - the Atlantic, Eastern, central, Mountain and pacific Time Zones. The difference between the local time of the Atlantic and Pacific coasts is nearly five hours.

v) S.S.R had eleven time zones before its disintegration. Russia now has nine time zones.

C) The International date line

i) A traveller going eastwards gains time from Greenwich until he reaches the meridian 180°E, when he will

be 12 hours when he reaches 180° W. There is a total difference of 24 hours. he 12 hours ahead of GM

ii) Similarly, in going westwards, he loses 12 hours when he reaches 180° W. There is thus a total difference of 24 hours, or a whole day between the two sides of the 180° meridian.

D) Why is the international dateline drawn in a ZIGZAG Manner.

ans- Some groups of Islands (Polynesia, Melanesia, Micronesia) fall on either of the dateline. So if the dateline was straight, then two regions of the same Island country or Island group would fall under different date zones. Thus, to avoid any confusion of date, this line is drawn through where the sea lies and not land. Hence, the IDL is drawn in a Zig-Zag manner.

4) INDIAN STANDARD Time

The Indian Government has accepted the meridian of 82.5° east for the Standard time which is 5 hours 30 mins ahead of Greenwich Mean Time.

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ñ) QUESTIONS

Ex-1 Determine the local time of Thimpu (Bhutan) located at 90° east longitude when the time at Greenwich (0°) is 12:00 noon.

Statements: The time increases at a rate of 4 minutes per one degree of longitude, east of the prime meridian.

ans- Difference between Greenwich and Thimpu = 90° of longitude
Total time difference = 90 × 4 = 360
360/60 = 6 hours
6 hours / Local time of Thimphu is 6 hours more than the the Greenwich, i.e. 6:00 pm.

Why is it at 5:30 pm in India and 12:00 noon in London?

ans- Prime meridian or 0-degree longitude passes from London. India located east of London at 82 degrees 30 E. Since the Earth takes 24 hours to rotate on its own axis or to cross 360 degree longitudes.
360 degree = 24 hours × 60 minutes
1 degree = 24 × 60/30 = 4 min

Indian standard times passes through 82 degrees 30'E.

82 degrees = 82 x 4/60 = 328/60 = 5 hours 28 min

30'E = 1/2 degree = 2 minute

Hence : 82' degree 30' = 5 hours and 30 minute.