IMPORTANT NOTE ON LATITUDE AND LONGITUDE

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1) Latitude and longitude

i) Latitudes and longitudes are imaginary lines used to determine the location of a place on earth.

ii) The shape of the earth "Geoid". And the location of a place on the earth can be mentioned in terms of latitudes and longitudes.

iii) Ex- The location of India - the longitudinal extent of India is 68°7'E and 97°25'E whereas the latitudinal extent of India is 8°4' N and 36°7'N.

2) Latitude

The parallels of latitude refer to the angular distance, in degrees, minutes and seconds of a point north or south of the equator. Lines of latitudes are often referred to as parallels.

A) Important Parallels of Latitude

i) Besides the equator (0°), the north pole (90°N) and the south pole (90°S) there are four important parallels of latitude.

ii) Tropic of Cancer ~~23~~ 23 1/2° N in the northern hemisphere.

iii) Tropic of Capricorn 23 1/2° S in the southern hemisphere.

iv) Artic Circle 66 1/2° N in the northern hemisphere.

v) Antartic Circle 66 1/2° S in the southern hemisphere.

B) Latitudenal Heat Zones of the Earth:

TORRID ZONES →

The mid-day sun is exactly overhead atleast once a year on all latitudes in between the Tropic of Cancer and the Tropic of Capricorn.

TEMPERATE ZONES →

The areas bounded by the Tropic of cancer and the Arctic circle in the northern hemisphere and the Tropic of capricon and the Antartic circle in the southern hemisphere, have moderate temp.

FRIGID ZONE -

Areas lying between the Artic Circle and the North Pole in the northern hemisphere and the Antartic Circle and the South Pole in the southern hemisphere are very cold. It is because here the Sun doesn't raise much ~~about~~ above the horizon.

3) LONGITUDE -

Refers to the angular distance, in degrees, minutes and seconds, of a point east or west of the Prime Meridian. Lines of longitude are often referred to as meridians.

A) Longitude And Time →

i) Since the earth makes one complete revolution of 360° in one day, it passes through 15° in one hour or 1° in 4 mins.

ii) The earth rotates from west to east, so every 15°, we go eastwards, local time is advanced by 1 hr. Conversly, if we go westwards, local time is retarded by 1 hour.

iii) We may thus conclude that places east of Greenwhich see the sun earlier and gain time, whereas places west of Greenwhich see the sun later and lose time.

B) STANDARD TIME AND TIME ZONES

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 U.S.S.R., it would be inconvinent to have single time zone. So these countries have multiple time zones.

iv) Both Canada, USA have five time zones- the Atlantic, Eastern, Central, Mountain and Pacific Time Zones. The difference between the local time of

Atlantic and Pacific coasts is nearly five hours.

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

C) INTERNATIONAL DATE LINE

i) A traveller going eastwards gains time from Greenwhich untill he reaches the meridian 180°E, when he will be 12 hours ahead of GMT.

ii) Similarly going westwards, he loses 12 hours when he reaches 180° W. Thus there is a total difference of 24 hours between the two sides of the 180° meridian.

D) Why is the International Date Line drawn in a zig zag manner?

Some groups of island (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~~ 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 the ~~line~~ 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°E for the standard time which is 5 hours 30 mins, ahead of Greenwich Mean Time.

5) QUESTIONS

Q1. Determine the local time of Thimpu (Bhutan) located at 90°E longitude when the time at Greenwich (0°) is 12.00 noon.

Statement: 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 longitudes

Total time difference = 90 × 4
= 360 minutes

360/60 hours = 6 hours / Local time of Thimpu is 6 hours more than that at Greenwhich, i.e. 6:00 p.m.

Q2. Determine the local time of New Orleans (the place, which was worst affected by Katrina Hurricane in October 2005,) located at 90° W longitude when the time ~~is~~ at Greenwhich (0°) is 12 noon.

Statement: The time decrease, at a rate of 4 minutes per one degree of longitude, west of the prime meridian.

Ans⇒ Difference between Greenwhich and New Orleans = 90° of longitudes
Total time difference = 90 × 4
= 360 minutes

360/60 hours = 6 hours / Local time of New Orleans is 6 hours less than that at Greenwhich, i.e. 6:00 a.m.

Q3. 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 axis or to cross ~~the~~ 360-degree longitudes.

360 degree = 24 X 60 minutes

1 degree = 24 X 60/360

= 4 minutes

Indian standard time passes through 82 degrees 30'E.

82 degrees = 82 X 4 / 60

= 328 / 60

= 5 hours 28 minutes

30'E = 1/2 degree

= 2 minutes

Hence: 82 degrees 30'E = 5 hours 30 minutes