Seasons and Time

1. Reasons for the occurrence of seasons

Revolution, Parallelism of the earth's axis and inclination of the axis.

2. Parallelism of the earth's axis The axis of the earth is tilted at an angle of 66½° from the orbital plane. If measured from the vertical plane this would be 23½°.The earth maintains this tilt throughout its revolution. This is known as the parallelism of the earth's axis

3. Apparent movements of the sun The sun shifts apparently between Tropic of Cancer (23½°north) and Tropic of Capricorn (23½°South).This is known as Apparent movements of the sun. The apparent movement of the sun due to the inclination of axis is the reason for the occurrence of seasons.

4. Results of the apparent movements of the sun The apparent movement of the sun due to the inclination of axis is the reason for the occurrence of seasons. There will be variation in the amount of solar energy received on earth due to the apparent movement of the sun. The sun's rays fall vertically over one hemisphere during one half of the year and on the other hemisphere during the other half. Temperature will be higher over places where the vertical rays of the sun fall. The temperature will be low at places where the sun's rays are slanting.

5. Equinoxes Equal amount of sunlight is received in the northern as well as the southern hemisphere when the sun is vertically over the equator. The apparent position of the sun during the earth's revolution will be over the equator on March 21 and September 23. Hence length of day and night will be equal during these days on both the hemisphere. These days are called equinoxes

6. Summer Solstice The apparent position of the sun shifts from the equator to the northern hemisphere from March 21 to June 21.The sun will be vertically above the Tropic of Cancer on June 21.This day is known as summer solstice, has the longest day in the northern hemisphere and the longest night in the southern hemisphere.

7. Winter Solstice The apparent position of the sun shifts from the equator to the southern hemisphere from September 23 to December 22. The sun reaches vertically above the Tropic of Capricorn on December 22. This day is known as winter solstice, has the longest day in the southern hemisphere

and the longest night in the northern hemisphere.

8. Utharayanam

Following the winter solstice, the Sun sets its northward apparent movement from Tropic of Capricorn (231⁄2°S) and it culminates on Tropic of Cancer (231⁄2°N) on 21 June. This northward apparent movement of the

Sun from Tropic of Capricorn to Tropic of Cancer is termed as 'Utharayanam'. The duration of day in the northern hemisphere gradually increases during this period.

9. Dakshinayanam

Following the summer solstice, the Sun sets its southward apparent movement from Tropic of Cancer (231⁄2°N) and it culminates on Tropic of Capricorn (231⁄2°S) on 22 December. This southward apparent movement of the Sun from Tropic of Cancer to Tropic of Capricorn is termed as 'Dakshinayanam'.

10. Spring Season

Spring is the season of transition from winter to summer. During this time that plants sprout, mango trees bloom and jack fruit tree bear buds. March and April are the spring months in the northern hemisphere and October and November in the southern hemisphere.

11. Autumn Season

Autumn marks the transition from the severity of summer towards winter. During this period the atmospheric temperature decreases considerably. This is followed by a shortening of day and lengthening of night. This is the seasons during which the trees generally shed their leaves. The shedding of leaves is a form of adaptation to survive the forthcoming winter. Autumn is experienced in the northern hemisphere during the months of October and November and southern hemisphere during the months of March and April. _

12. Explain the seasons of the Earth

During the period from September to march it will be winter in the northern hemisphere and summer in the southern hemisphere. Spring and autumn are the two transition seasons (explains Equinoxes, Summer Solstice, Winter Solstice, spring season and autumn season)

13. Seasonal change and duration of day in Tropical region

a) The seasonal changes is not pronounced in the tropics. Hot climate prevails in the equatorial region throughout the year. b) There will not be any marked difference in the length of day and night

14. Seasonal change in Mid latitudes region

Seasonal change are profound in the mid latitudes region.

15. Seasonal change and duration of day in Polar region

In the poles summers are cooler and shorter and winters are severe and longer. When the sun is above Tropic of Cancer, continuous day light is received for six months throughout in the places within the Arctic Circle. During the remaining six months, when the sun is in the southern hemisphere, it will be six months of night throughout in the places within the Arctic Circle. When it is day in the Arctic Circle, it is night in the Antarctic Circle and vice versa.

16. Local time

When the sun is vertically overhead, it is noon. The time estimated at each place, based on the apex position of the sun is termed as the local time.

17. Facts associated with rotation of earth

a)The earth rotates from west to east b)It takes 24 hours to complete one rotation c) As the earth rotates from west to east, the sun rises first in the eastern side

18.Each degree of longitudes corresponds to four minutes of time. Explain

The angular distance of the earth is 360°. The time required to complete a 360° rotation is 24 hours. On converting 24 hours into minutes -24 x60 = 1440 minutes. The time required for the earth to complete the rotation of 1° longitude is 1440/360 =4 minutes. The time required for the rotation of 15° longitudinal area is 15 x4 = 60 minutes (1 hour)

19. Greenwich Time(GMT) and Time zones

The zero degree longitude is known as the Greenwich Meridian. It acquires its name from Greenwich, the place where the Royal British observatory is situated and through which this line passes. Time is calculated worldwide is based on the Greenwich line. Hence this line is also known as Prime Meridian. The local time at the Prime Meridian is known as the Greenwich Mean Time (GMT). Based on the Greenwich line, the world is divided in to 24 zones, each with a time difference of one hour. These are known as time zones.

20. Standard time

The local time would be different at each longitude. It would create a lot of confusion. To solve this, the longitude that passes through the middle of a country is selected as standard
meridian. The local time at the standard meridian is the standard time.

21. Indian Standard Time

The 82 ½° E longitude is considered as standard meridian of India. The local time along this longitude is generally considered as the common time of India. This is known as the Indian Standard Time.

23. International Date Line

180° longitude is known as International Date Line. There is a difference of 24 hours on both sides of 180° longitude. So the travellers who cross 180° longitude from the east to the west calculate time by advancing one day. The travellers who cross the line from the west to east deduct one day. This line is not a straight line. Land area has been avoided along 180° longitude.

സമയം (Time) കാണുന്നതിന്.....

STEP 1- LD (Longitudinal Difference)(രേഖാംശീയ വ്യത്യാസം) കാണുക .

.....LD കാണുന്നതിന്

.....A) ഒരേ ദിക്കിലാണെങ്കിൽ (direction) വ്യത്യാസം (Subtraction)കാണുക

.....B)രണ്ടു ദിക്കാണെങ്കിൽ(direction)കൂട്ടി (Addition)എഴുതുക

STEP 2- TD(Time difference)(സമയ വ്യത്യാസം)കാണുക

.....TD = LD x 4

STEP 3- TDH (Time difference in hour)(സമയ വ്യത്യാസം മണിക്കൂറിൽ)

.....കാണുക

.....TDH = TD/60 (60 കൊണ്ട് ഭാഗിക്കുക)

STEP 4- സമയം(TIME) കണ്ടെത്തുക(കൂടുക അല്ലെങ്കിൽ കുറയ്ക്കുക) .....

A) കൂട്ടുന്നത് (Addition) : തന്നിരിക്കുന്ന രേഖാംശത്തിന്റെ (Longitude)

..... കിഴക്കുള്ള(East) രേഖാംശരേഖയിലെ(Longitude) സമയമാണ്

.....കാണേണ്ടതെങ്കിൽ കൂട്ടുക (Addition) .....

B)കുറയ്ക്കുക. (Subtraction) : തന്നിരിക്കുന്ന രേഖാംശത്തിന്റെ .....

(Longitude)പടിഞ്ഞാറുള്ള (West)രേഖാംശരേഖയിലെ (Longitude)

.....സമയമാണ് കാണേണ്ടതെങ്കിൽ കുറയ്ക്കുക **PRADEEP GHSS PUTHOOR**