

GS Advanced Program 2023

Generic Booklet

Test Name/Code/No. :694049

Name

Email ID.

Roll No.

Mobile No.

Date

19/01/2023

Allotted Time : 60 Minutes

Instructions to Candidates -

- There are 7 Questions in this Question paper.
- All Questions are Compulsory.
- For all updates, please visit the noticeboard -
<https://noticeboard.forumias.com/gsap-2023/>

Important -

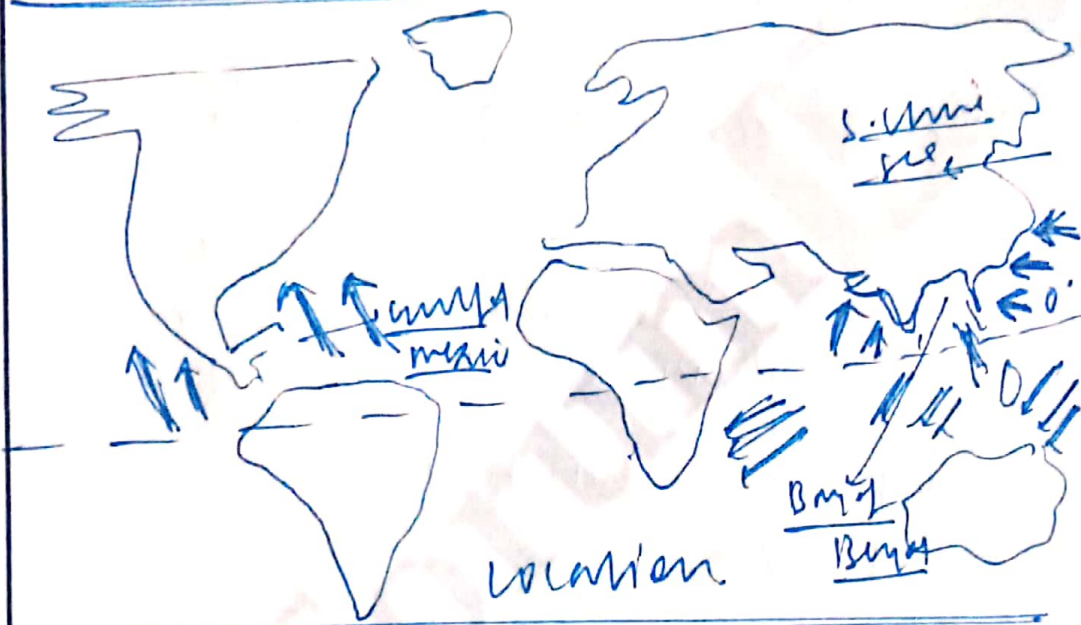
- Answers must be attempted in the QCA Booklet only.
- To upload the Answer Copies please visit to "My Course" section on -
<https://academy.forumias.com/>
- Only those copies will be evaluated which will be submitted before the next class.

Q. No.	Grade/Score
1	
2	
3	
4	
5	
6	
7	
Overall Grade/Score	

Start Writing Here

Q.1)

Tropical cyclones are low pressure systems that form over warm tropical waters.



[confirmed to S. China Sea,
Bay of Bengal, Gulf of Mexico]

- Large bodies of warm water need to form
ex S. China Sea. etc.
- continuous evaporation from
sustain tropical cyclone.
possible here.

- Tropical zone makes them suitable. (10°-30°) high sea surface temperature
 - Absence of cold currents here.
 - Dying remains of westerlies
Ex →
 ↓
 atmospheric disturbance triggered by low pressure upper
 tropics
 — ~~minimum~~ ^{higher} wind storm in subtropical
 - minimal / low wind shear
- As to Research, climate change decreasing the frequency and increasing the intensity of tropical cyclones.
 ex cyclone + typhoon

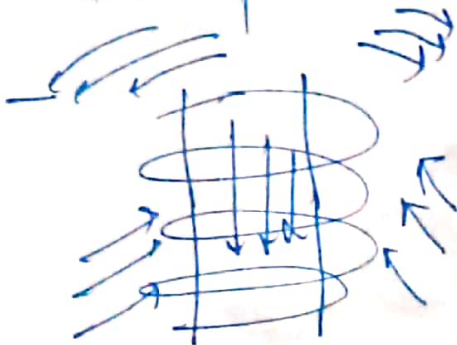
Overall Grading (✓)

Poor			Average			Good		
1	2	3	4	5	6	7	8	9

Q.2)

TROPICAL

- rapid rotating storm originating over tropical ocean from where it draws the energy to develop

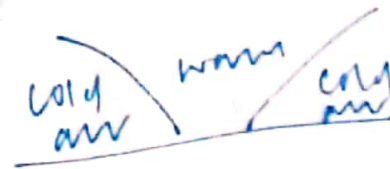


- structure
- 3 stage

- heat engine by latent heat of condensation

TEMPERATE

- develop in middle and high latitudes where 2 opposite air masses collide



- structure
- 4 stage

- well developed frontal system

- | | |
|---------------------------|--------------------------|
| - Sea only | - Both land and sea |
| - Gail to west direction | - west to east direction |
| - 5'-15' location | - middle uph latitude |
| - Diameter 80-300 km | - up to 100 km |
| - 120-180 kph speed | - 3-40 kph |
| - very destructive mainly | - less destruction |
| - summer | - year long. |

climate change making them difficult to predict

Overall Grading (✓)

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Q.3)

Bombogenesis occurs when a midlatitude cyclone rapidly intensifies / strengthens over a 24 hour period. (24 drop).
(24 min bar)

Bombogenesis	Temperate cyclone
- occur in mid latitude - Rapid drop in pressure - wind speed 120-155 Kph - Extra tropical cyclone	- occur in both high and mid latitudes. - not much large - wind speed 3-40 kph. - extra tropical

- huge
destruction
road
accidents

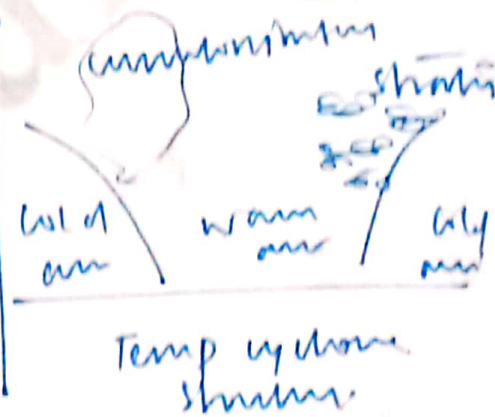
- less or
no
destruction

- Typically
winter

- Year long

- ex
VIA

- ex
VIA



Due to climate change we
can expect more tornados,
according to IPCC report

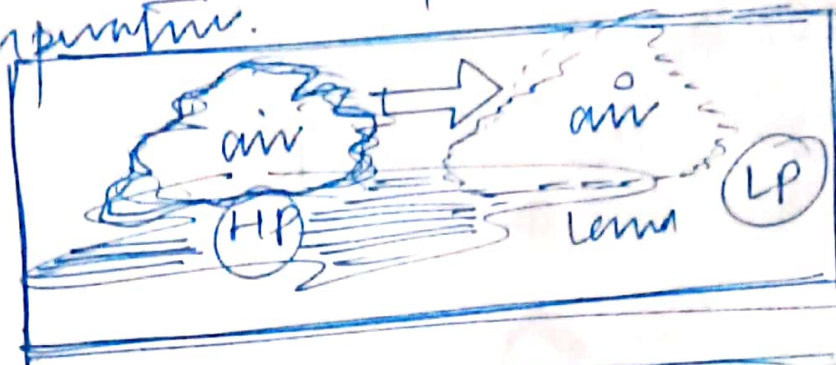
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Q.4)

the movement of air is mainly caused due to the differences in pressure and temperature.



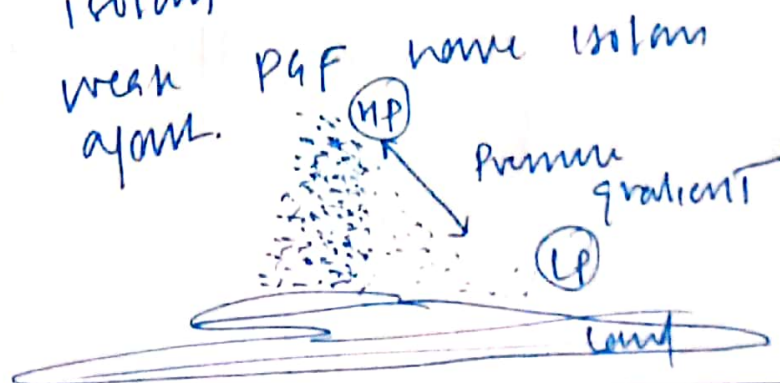
mainly 3 factors govern surface air movement

A. Pressure Gradient Force

↳ Difference in atmospheric pressure from a form

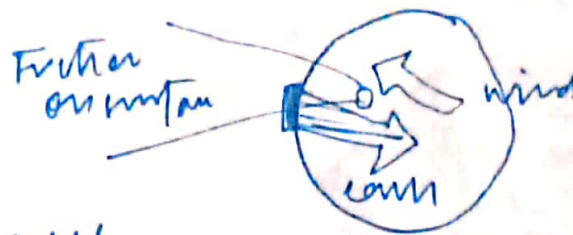
↳ strong pressure gradient force have close isolines

↳ weak PGF have isolines apart.



2. Frictional Force

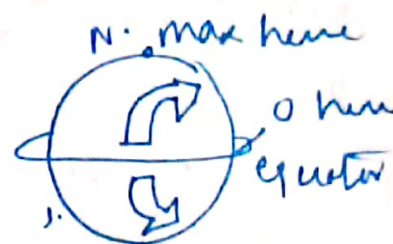
- ↳ Greatest at surface
- ↳ influence extends upto 1-3km
- ↳ ^{over} sea friction - minimum.



3. Coriolis force

Apparent force which deflects the direction of surface wind.

direction of deflection



4. Gravitational force

It act downwards.

movement of air affects the climate of region.

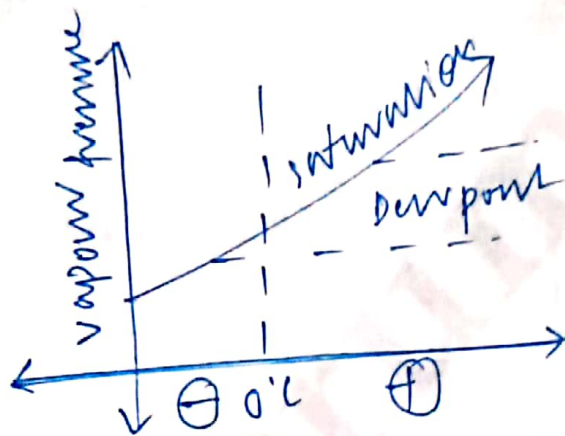
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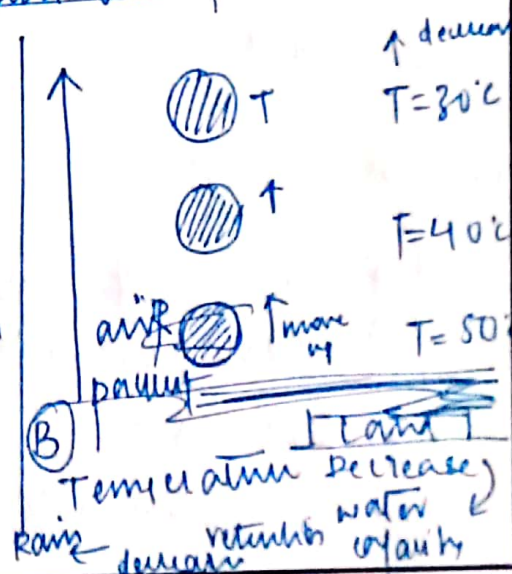
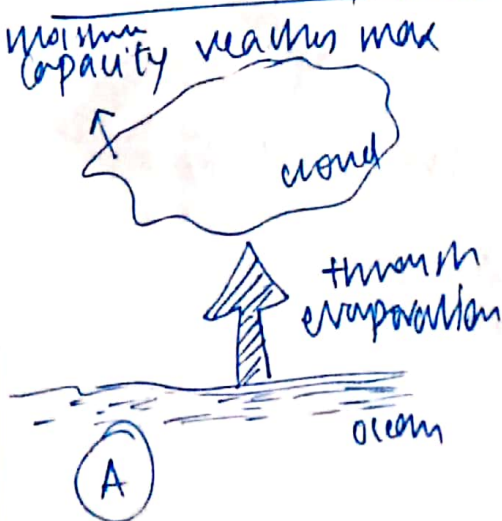
Q.5)

The dew point is the temperature at which air is saturated with water vapour. (Same state of H_2O).



WAYS OF AIR SATURATION / To reach dew point

Moisture capacity reaches max



~~where~~ Dew formation $\Rightarrow$ formation of
moisture condensation

Dew point $>$ Freezing point $=$
condensation (liquid)
rainfall

Dew point $<$ Freezing point
 $=$ snow fall
condensation (solid)

Factors on which condensation
depends

percentage of
relative
humidity

degree of cooling
of the air

condensation is influenced by

- $\hookrightarrow$ volume of air
- $\rightarrow$ Temperature
- $\hookrightarrow$ pressure
- $\hookrightarrow$ humidity.

When condensation takes place

(A) Temperature of the air is reduced to dew point with it volume remaining constant (volume, Temperature reduced)

(B) moisture is added to air through evaporation

most favorable → upper atmosphere
Rainfall happens this way.

↳ snowfall type condensation occurs in high areas generally
↳ Rainfall type condensation occurs in plain generally.

Climate change is speeding up condensation phenomenon and water cycle.

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Q.6)

After condensation of water vapor release of moisture is known as precipitation.

Types of precipitation

- A. in the form of water is called rainfall
- B. in the form of ice is called snowfall (Temperature lower than 0°C)
- C. Hail : frozen raindrops and refrozen melted snow water

— Layer of air with Temperature above freezing

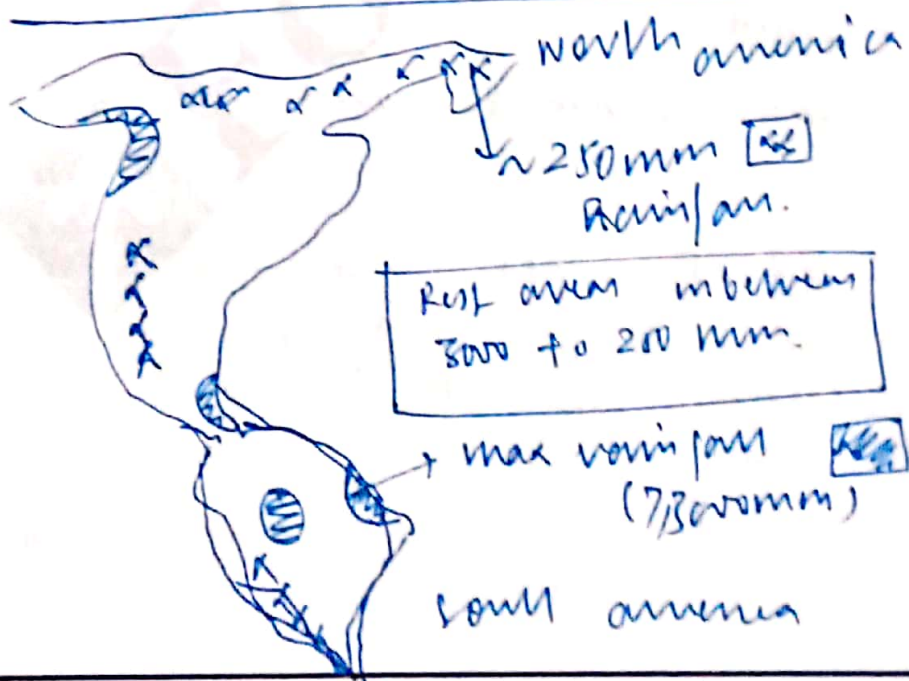
Point overlies a subfreezing layer near the ground.

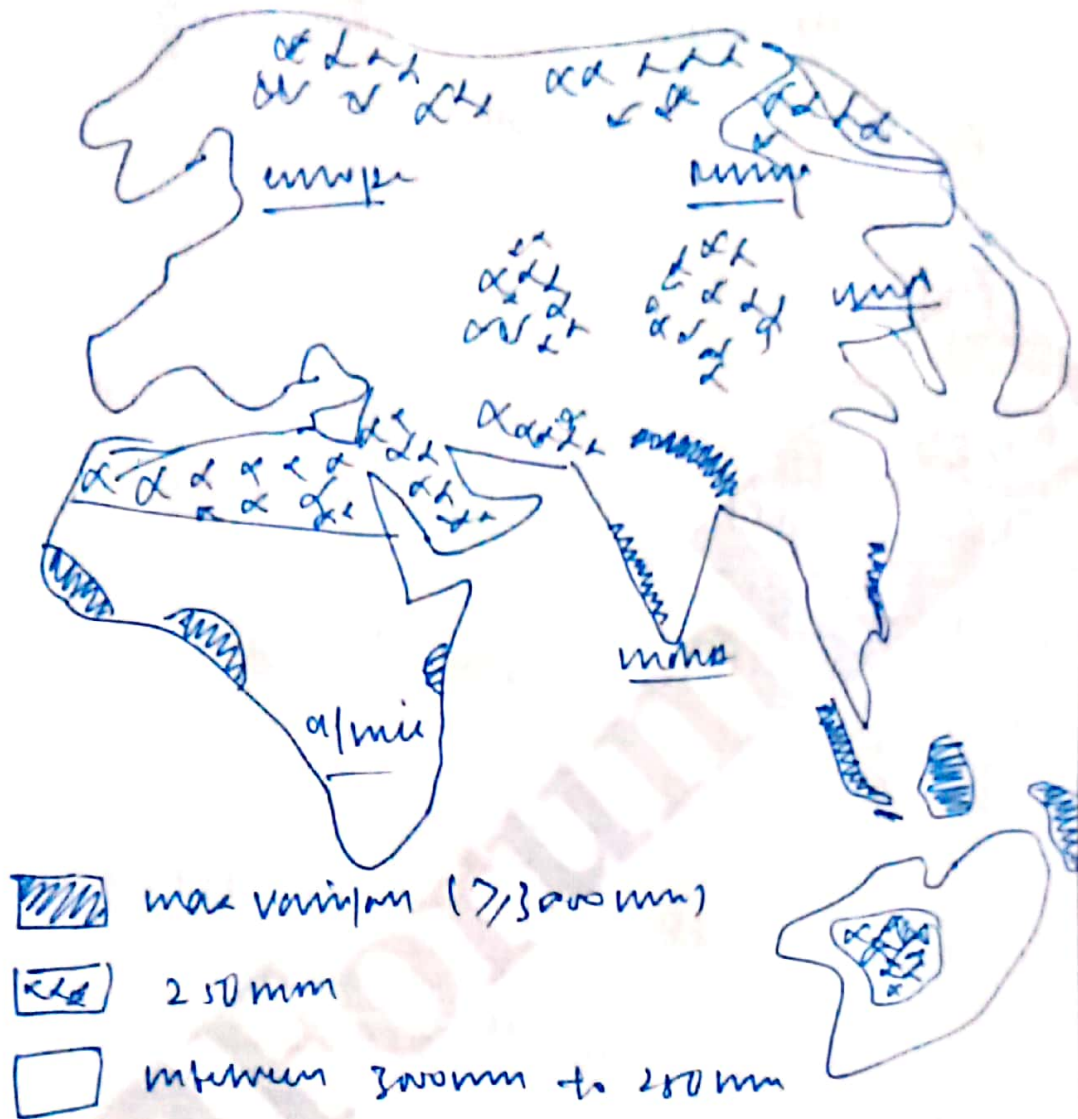
D. Hailstorm

- Drops of rain getting solidified into small rounded solid pieces of ice
- they have concentric layers of ice.



Distribution of precipitation





IPU report says at high latitudes precipitation is likely to increase while at sub-tropical latitudes.

Overall Grading (✓)

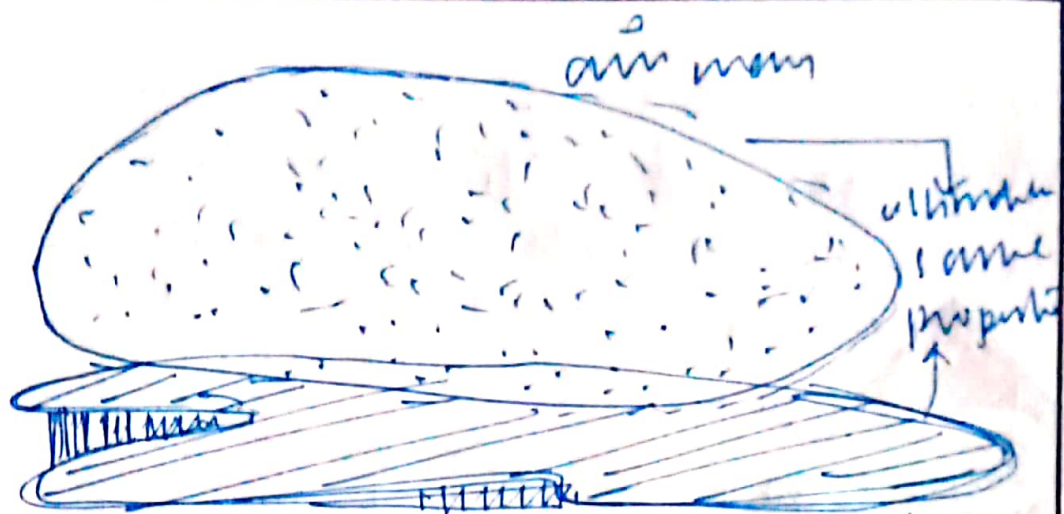
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Air mass is defined as a homogeneous body of air in which the upward gradient of temperature and humidity are fairly uniform over an extensive area covering thousands to millions of km^2 .

How do they originate

they originate when atmospheric conditions remain stable and uniform over an extensive area (source region) for a fairly long period so that the air lying above the area attains the temperature and moisture characteristics of the ground surface.



ex. HOT - HOT
cold - cold.

Ex Land (lower
arctic region
sahara etc.)

Features of some regions

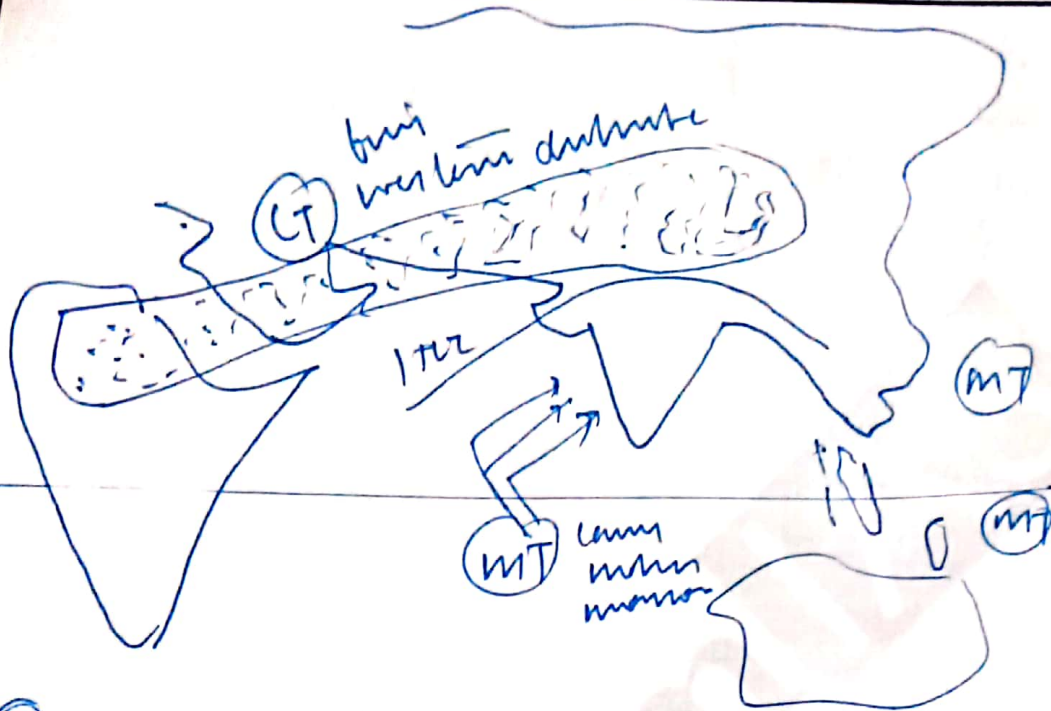
extensive
homogeneity

No convergence
of air,
rather there
should be a
divergence

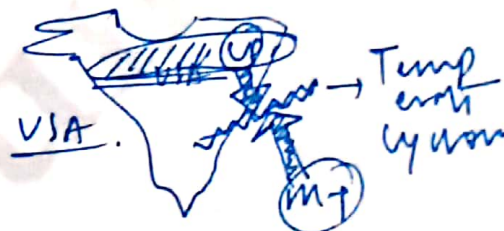
atmospheric
conditions
should be
stable

Role in influencing climate pattern around

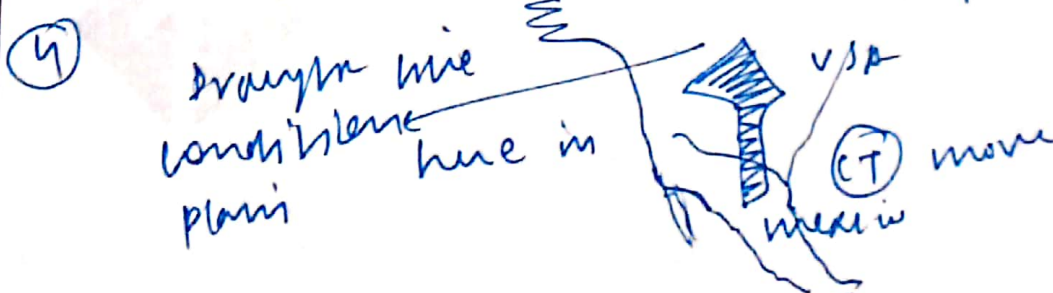
1. Summer monsoon : the weather
of south and south east asia
is largely controlled by monsoon
tropical air masses. (MT)



② Temperate cyclones
Frontogenesis, Temperate cyclones explain mobility in this latitude



③ Western disturbance : brings rain over the northern part of India during winter → benefit kharif crops.



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Poor			Average			Good		
1	2	3	4	5	6	7	8	9

ForumIAS

(Don't Write
anything in this Area)

here along with mentioned
condition air masses & layers
critical role in influencing
climate pattern.