Q1] Define Meterology & Agricultural Meterology and scope and Importance of Agricultural Meterology. (1)

⇒ Def^n [Meterology] →

Meterology is defined as the science of atmosphere.

Def^n [Agricultural Meterology] →

It is defined as Agricultural meterology as meterology in it's relation to Agriculture.

* [Scope and Importance] →

(1) Navigation –
(2) Aviation –
(3) Animal production –
(4) Fishery industry –
(5) Irrigation and water resources –
(6) Land use planning –
(7) public and civil agencies –
(8) public health –
(9) commerce –

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(1) [Navigation] →

- Navigation on sea the knowledge of adverse whether. i.e large tidal waves, ocean waves, high speed wind.

(2) [Aviation] →

- For transport through air, the pilots need the information about atmospheric condition such as the electric lightening high speed wind.

(3) **Animal production** →

- Beef, poultry and milk production also depend on weather and meteorology provides the information for successful animal production and animal husbundary

(4) **Fishery Industries** →

- Fishermen need information of atmospheric and oceanic changes before they proceed on sea for fishing and this is possible from Meterological knowledge.

(5) **Irrigation and water resources** →

- Meterological and hydrological information assists in planning the location, size and storage capacities of dams to ensure water supply for irrigation and domestic needs.

(6) **Land use planning** →

- The meteorological data supplemented with soil and topographic information help to plan the sites for the specific Land use for crop production

(7) **Commerce** →

- Trading of any item is made According to need of the people in relation to wether prevelling e.g Gum shoes, umbrela & raincoats

Q2] Define condensation & explain its forms/types 2 of condensation.

⇒ Defⁿ [condensation] →

It is the process in which water vapour is converted into liquid is called condensation.

* [Forms/Types of condensation.] →

(1) Dew -
(2) Frost -
(3) Fog -
(4) Mist -
(5) Rim -
(6) smog -
(7) Haze -

(1) [Dew] →

- The deposition of water vapour in the form of tiny droplets on the colder bodies by condensation is known as "Dew"
- The clear sky, absence of wind, the object on which dew forms must be good raditor & bad conductor.

(2) [Frost] →

- When the temprature of air falls bellow 0°c before the dew point is reached, the water vapour is directly converted into crystals of ice & this is called "Frost"
- It is frequantly called as as a form of sublimation,
- Frost is injurious to vegetation.

(3) [Fog] →

- Extremely small water droplets suspending in the atmosphere and reducing the Horizontal visibility is "Fog"

classification of fog

- (A) Thik fog (visibility upto 45 m)
- (B) Moderate fog (visibility upto 450 m)
- (C) Thin fog (visibility upto 900m)

(4) **Mist** →

- Mist is less dense fog
- The suspended water droplets restriks visibility 1000 to 2000 m or 4 on the coded scale.

(5) **Rime** →

- It is formed when ~~level~~ wet fog having super cooled droplets immediately freeze & striking objects like telegraph post having temprature below Freezing point.
- White ice is formed on windward side

(6) **smog** →

- The combined effect of smoke & fog droplets may reduce visibility and this phenomena is called "smog"

(7) **Haze** →

- Some solid particles like dust, smoke From fire and industry restrict visibility in size.

Q3] Define Drought & Give the classification of Drought. (3)

⇒ Def^n [Drought] →

- Drought is the moisture dificit which results when the amount of water available in the soil is not sufficient to meet the demands of potential evapo-transpiration.

(OR)

Drought is a period of inadequate or no rain fall over extended time creating soil moisture deficit and Hydrological imbalances

* [classification of Drought]

[A] Based on source of water availability -

(1) Meterological drought
   a) slight drought -
   b) Moderate drought
   c) severe drought

(2) Hydrological drought -

(3) Agricultural drought -

[B] Based on Time of occurance -

(1) permanent drought -

(2) seasonal drought -

(3) contingent drought -

[C] Based on Medium -

(1) Soil drought -

(2) Atmospharic drought -

[A] Based on source of water availability →

(1) Meterological Drought →

- It is defined as the situation when actual rainfall is less than 75% of the normal rainfall over an area.
- the meterological drought mainly deficient rain of different quantum.

(2) Hydrological Drought →

- It is defined as the situation of dificit rainfall when the Hydrological source like streams rivers.
- reservairs takes, well dry up and ground water teble depletes.

(3) Agricultural Drought →

- This is the situation resulted from inadequate rainfall when soil moisture falls short to meet the water demand growth.

Q4] Define Rainfall & Explain Types of Rainfall

⇒ Defn Rainfall →

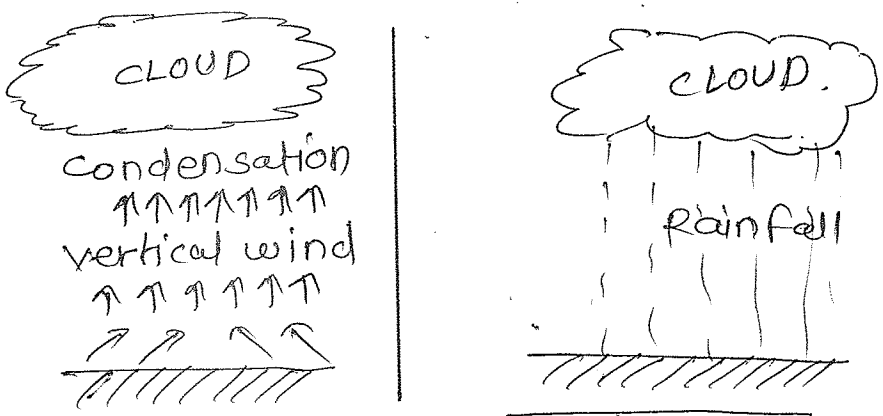
Rainfall is defined as the quantity of water falling on unit area of earth surface in specified time.

* Types of Rainfall →

(1) convectional rains –
~~(2) orge~~
(2) orographic or relief rains –
(3) cyclonic, frontal & convergent rains –
(4) Thunderstroms –

(1) convectional rains →

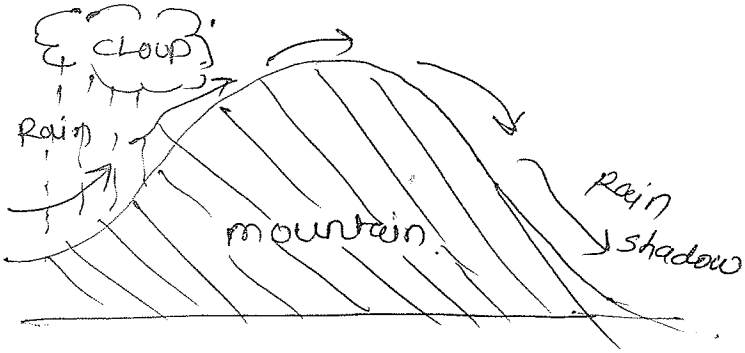
– due to heating, the air near the ground becomes hot and light and starts upward movement This is known as "convection"



convectional rains

(2) orographic or relief rains →

– When the moist air coming from sea encounters mountain or relief barrier, it can not move horizontally and has to overcome mountain.



(3) **Cyclonic / Frontal & convergent rain** →

- Frontal precipitation is produced when two opposing air currents with different temprature meet, vertical lifting takes place which gives rise to condensation & precipitation.

Q5] Define weather & climate explain element of wether & climate and factor affecting climate.

⇒ Defⁿ **Weather** →

Weather can be defined as the physical condition or state of the atmosphere at a perticular time & place.

* **Element of Wether / factor** →

(1) Radiation –
(2) Air Temprature –
(3) Atmospheric pressure –
(4) wind velocity –
(5) Evaporation –
(6) Humidity –
(7) Rainfall / cloud –
(8) Visibility sunshine –

Defⁿ **climate** →

climate is defined as the generalized or average condition of weather of place or region.

* **Factors affecting climate →**

(1) Lattitude –
(2) Altitude –
(3) Topography –
(4) mountains –
(5) Land and sea –
(6) Ocean currents –
(7) water bodies –
(8) snow & ice –
(9) vegetation –
(10) soil colour –

(1) **Lattitude →**

- The most important influence of Lattitude is on temprature of a place
- Temprature tends to decrease with increase in Lattitude.

(2) **Altitude →**

- pressure and temprature generally decreases with increase in altitude, and the capacity air to hold moisture also decreases.

(3) **Topography →**

- Wind velocity primarily changes with change in topography which may result in change in temprature.

(4) **Mountains →**

- High mountains chains act as a barries to free flow of winds and divide one type of climatic zone from another.

(5) **Land and sea distribution** →

- Distribution of land and sea has a profound effect on climate
- places near the sea have moderate climate

(6) **Ocean currents** →

- ocean currents have a considerable influence on the climate of the coastal region and Islands near which they flow.

(7) **Vegetation** →

- The dense vegetation has higher evapo-transpiration rate and thus increasing humidity and rainfall of the area.

(8) **Snow and Ice** →

- snow increases anual range of temprature by increasing radiation during winter.

Q6] Define wind & Importance & classification of wind.

⇒ Def^n **wind** →

The horizontal flow of air is called as wind.

* **Importance / Role / Effect of Wind** -

(1) Wind increase the transpiration and intake of O_2

(2) The turbulence created by wind increase CO_2 supply and the increase in photosynthesis

(3) When wind is hot, desiccation of the plants take place because humid air in inter cellular places is ~~replace~~ replaced by dry air.

(4) The hot and dry wind makes the cells expanding and eaely maturity it results in dwarfing of plants.

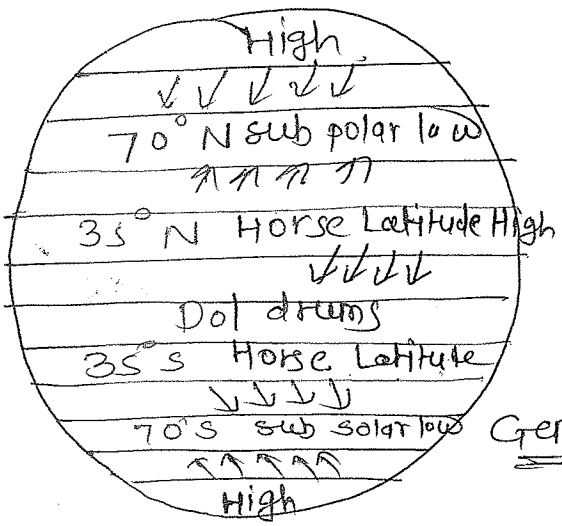
(5) strong winds produces lodging of crop.

* **classification of winds**

(i) Trade winds -
(ii) Westeelies or Antirade winds -
(iii) polar winds -
(iv) Local winds -
  a) Land & seas breeze -
  b) south west mansoon -
  c) North East Mansoon -

(1) **Trade Winds** →

- The condition of greatest heating and expansion at the equator couses rising of air and creating low pressure.



General circulation system of wind

Q7] Define preciptation and Explain it's forms / ~~and~~ Types

→ Defn precipitation →

It can be defined as earthward falling of water drops or ice particles that have formed by rapid condensation in the atmosphere.

* Forms of precipitation / Types —

(a) Liquid forms — Rain, drizzle
(b) solid form — snow and hail
(c) Mixed form — sleet and Hail / storm.

[A] Liquid forms →

I) Rain → Rain is defined as precipatation of drops of Liquid water

- The cloud consists of moisture droplets of water of diameter 0.02 mm

II) Drizzle →

- It is more or less uniform precipitation of very small and numerous rain drops

III) shower → precipitation losting for a short time with relatively clear intervals is called slower.

[B] Solid forms →

I) Snow — snow is defined as precipitation of water in solid form of small crystals

ii) **Hail** → Hail is precipitation of solid ice. on warm sunny day. a strong convective column may cause the formation of pellets having spherical shape and conventeic layers.

[c] **Mixed form** →

i) **sleet** → simultaneous precipitation of the mixture of Rain and snow is called sleet

ii) **Hail storm** → Rainfall associated with hail stones is called as Hails storm.

Q8] Define solar Radiation. Factor affecting solar radiation Importance of solar Radiation in Agriculture

⇒ Def^ **Solar Radiation** →

It is the form of energy that is received from sun in the form of insolation through short wavelength.

* **Importance / signifacance solar Radiation** →

(1) It is provides the necessary energy for all the phenomena concerning biomass production.

(2) photosynthetically Active Radiations (PAR) are the Real source of the energy for photosynthesis process.

(3) It also provides the energy for the physical processes taking place in plant soil & atmosphere

(4) It condition (governs) the distribution of tempreture and hence crop distribution on the earth surface.

* **Factor affecting solar Radiation** -

(1) Astronomical factors -

a) solar output —
b) Distance of the sun from earth —
c) altitude of the sun —
d) Duration of Day —

(2) Terrestrial factors -

a) Effect of atmosphere —
b) Effect of clouds —
c) Effect of land and sea —
d) Effect of latitude —

Q9] Define Atmosphere and Explain the physical structure of atmosphere

→ Def^n **Atmosphere** →

Atmosphere can be defined as the gaseous envelope surrounding the earth.

* **physical structure of Atmosphere** -

(1) Troposphere — } Lower atmosphere
(2) stratosphere — }

(III) Mesosphere
(IV) Thermosphere

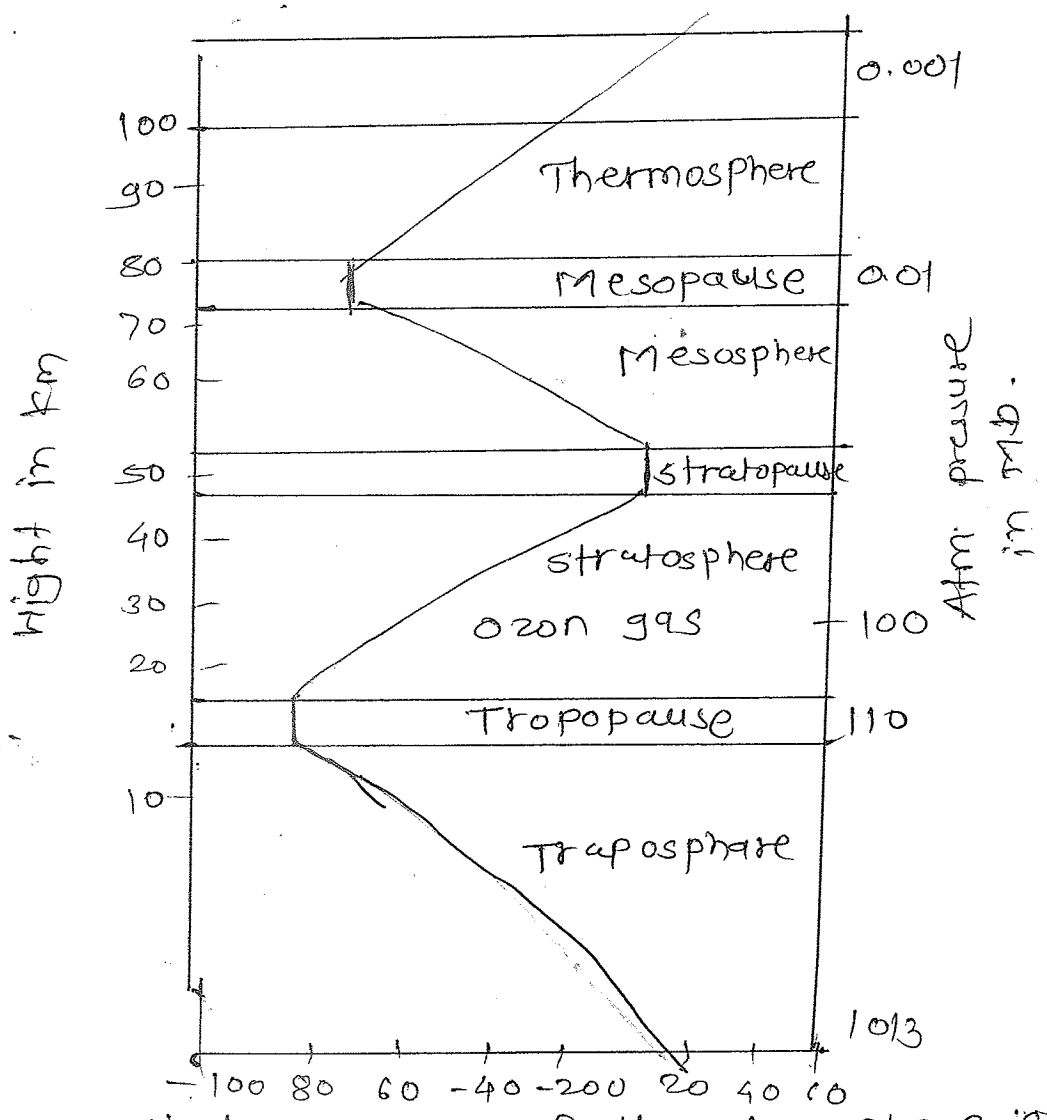
(1) **Trophosphere** →

(I) The word "tropo" means mixing or turbulence and "sphere" means region.

(II) The lowest layer of the atmosphere is called troposphere

(III) The Lattitude of the atmosphere changes According to Latitude

(IV) It has an elevation of about 16 km at the equator and only 8 km at the poles.



Vertical structure of the atmosphere on temp variation

(2) **stratosphere** →

- This is the second atmospheric layer above trop pouse which extends upwards about 50 km
- The stratosphere contains much of the total atmospheric ozone.
- The Density of ozone is maximum at 22 to 25 km height approximately.
- In stratosphere the temp increases with increase in Height.

(3) **Mesosphere** →

- This is the third layer of atmosphere
- A thin isothermal layer called a stratopause, is the boundary layer which separates stratosphere and mesosphere.
- The thin isothermal layer, which separates mesosphere from thermosphere is called mesopause.

(4) **Thermosphere** →

- outermost shell is known as thermo
- It lies above 80 km. hight.
- In this sphere the atmospheric densities are extenely low.
- In this sphere temprature increase with increase in height due to absorption of ultraviolet radiation From sun.

Q10] Define weather forecasting & explain types/ classification

⇒ Def^n [Weather forecasting] →

Any advance information about the probable weather in future obtained by evaluating the present and past meteorological condition of the atmosphere is called as "weather forecasting

* [classification / Types weather forecasting] –

(1) [Now casting] –

- Denotes very short range, say few hours from 6 to 24 Hours forecast at the time of cricket match during the day

(2) [short range forcast] →

- It is based on synoptic situation prevailing at the time of forecasting and is valid upto 3 days or 72 hrs and are issued twice a week.

(3) [Medium range forecast] →

- Forecast of Meterological elements over different agro-climatic zones for periods ranging from 3-10 days is known as medium range forecast.

(4) Long range forecast →

- The forecast valid for more than 10 days [i.e a month a seas season] is known as long range forcast.

* Technique of weather forecasting

(1) Synoptic method -
(2) Statical method -
(3) Numerical Weather prediction -
(4) persistance Method -
(5) Analog.

Q11] define cloud & Types / classification of clouds.

⇒ Def^n clouds →

- cloud can be defined as a mass of tiny dropletes or ice crystals or both condenced on hygroscopic nuclei and suspending in atmosphere.

* Types / classification of clouds →

(1) cirrus -
(2) cumulus -
(3) stratus -
(4) Nimbus -
(5) smog -
(6) Rime -
(7) cloud -

(1) **Cirrus** → (Ci)

- Meaning "curl" and is recognised by it's veil, like fibrous or feathery form.
- It is the highest type of cloud, ranging from approximately 7.2 km in altitude (20,000 to 35,000 feet)

(2) **Comulus** (CU) →

- Meaning "heap" is the wooly, bunchy cloud with rounded top and flat base
- It is the most common in the summer season and in lattitudes.
- It's height is variable and depends ~~and~~ on relative humidity of the air

(3) **Stratus** → (St)

- It is a sheet types cloud without any form to distinguish it
- It is usually lower than comules

(4) **Nimbus** → (NB)

- It is any dark and rangged cloud and from which precipitation occurs.

Q [2] Define Temprature. and factor affecting Temprature

⇒ Def^n **Temprature** →

The degree of hotness or coldness is known as temprature.

* Factor affecting Temprature →

(1) Lattitude –
(2) Attitude –
(3) Season –
(4) Distribution of Land and water –
(5) Topography –
(6) Ocean currents –
(7) winds –
(8) clouds and rain –
(9) colour of the soil –
(10) forest and vegetation –
(11) slope of land –

"Description see on the Notes"

Q[13] Define soil Temprature & Factor affecting soil Temprature.

⇒ Def^n [soil Temprature] →
The Exchange of heat between the soil and surface called soil temprature

* [factor affecting soil temprature] →

(1) solar radiation –
(2) Condensation –
(3) Evaporation –
(4) Rainfall –
(5) Vegetation –
(6) ~~Veg~~ colour of the soil
(7) Moisture content
(8) Tillage
(9) soil texture (10) organic matter content

(1) **Solar Radiation** →

- The amount of heat from the sun that reaches the earth is 2.0 cal / cm^2 min^{-1}
- The amount of Radiation received by the soil depends on angles with which the soil faces the sun.

(2) **Condensation** →

Whenever water vapour from soil depths or atmosphere condenses in the soil, its heat increases noticeably

(3) **Evaporation** →

The greater the rate of evaporation the more the soil is ~~cotted~~ cooled.

(4) **Rainfall** → Rainfall cools down the soil

(5) **Vegetation** →

Bare soils quickly absorbs heat and becomes very hot during the summer and become very cold during the winter

(6) **Colour of the soil** →

- Black coloured soils absorbs more heat than light coloured soils.
- Hence black colour soils are warmer than light coloured soils.

Q 14] Difference Between Weather & climate

Weather	climate
(1) Weather is instantaneous physical state of atmosphere.	(1) climate is generalized physical state of atmosphere.
(2) Weather changes to short-term duration in time	(2) climate changes long term duration in time
(3) weather changes place to place at the same time	(3) climate requires longer period for changes
(4) Weather is measured in observatory	(4) climate is ~~define~~ derived information on regional basis
(5) weather can be categorised as ~~fair~~ unfair settled	(5) climates are classified as desert continential marine
(6) It provides meteorological information	(6) It is geographical information
(7) Weather can be categorised as fair unfair, excellent etc.	(7) climate is classified as desert climate, marine climate, tropical climate etc.
(8) Adverse weather results into crop failure or loss and warrants short term contingent planning.	(8) climate is considered in long terms Agricultural planning,

— Important Quetions —

[A]

1. cyclones & Anticyclones
2. Hydrological cycle
3. Green house effect.

[B] Define crop modelling & state application in Agriculture