

MET. QUESTION BANK: DESCRIPTIVE QUESTIONS

(UNIT I) METEOROLOGY AND AGRO METEOROLOGY: MEANING AND SCOPE

- Q.1 Define meteorology and give its scope in general and particular in Agriculture.
- Q.2 Define agtil meteorology and explain its role in Agriculture.
- Q.3 Define weather and climate and differentiate between them.
- Q.4 Define and differentiate weather elements and climatic controls with examples.
- Q.5 The weather or climate is a natural resource and is an important basic input in agricultural planning and strategies 'Elaborate this statement'.
- Q.6 Discuss the role of agricultural meteorology in increasing crop production.

(UNIT II) ATMOSPHERE: COMPOSITION & STRUCTURE

- Q.7 Discuss usefulness of the atmosphere as a resource.
- Q.8 Give the composition of the atmosphere in the lower atmosphere. Discuss compositional layering in the upper atmosphere.
- Q.9 Discuss vertical variation of atmospheric composition.
- Q.10 Give the physical structure of the atmosphere based on vertical temperature variation.
- Q.11 What is ozonosphere and ionosphere? Discuss their importance.

(UNIT III) AIR-TEMPERATURE

- Q.12 What is thermal lag or thermal inertia. Give the general diurnal cycle of air temperature-variation.
- Q.13 What are the different factors affecting air temperature? Explain the construction of thermograph with diagram.
- Q.14 Give vertical and horizontal variation of temp.?
- Q.15 What is isotherm? What is its use? Why does the door of Stevenson's screen open towards the North? Give construction and working of Assmann's Psychrometer.
- Q.16 What is Lapse rate and Temp Inversion? Why saturated Adiabatic Lapse Rate (SALR) is always less than Dry Adiabatic Lapse Rate (DALR)?
- Q.17 What is adiabatic cooling? Define stability and instability of atmosphere? Discuss the conditions for stability and instability of dry air and saturated air ascent?
- Q.18 Define stability, absolute instability and absolute instability? Give conditions for stability and instability of dry air ascent.
- Q.19 What is potential temperature? Discuss the heating of the atmosphere by various processes.
- Q.20 State the values of DALR and SALR? Explain why the temperatures are different on the Earth.

(UNIT IV) ATMOSPHERIC PRESSURE

- Q.21 What is atmospheric pressure? How the normal atmospheric pressure is given and what is its value? Give the construction and write about working of any instrument used for recording atmospheric pressure.
- Q.22 State how the atmospheric pressure is measured with Fortin's Barometer in brief what are the different corrections made to this reading.
- Q.23 Give the various units for atmospheric pressure. State the approximate forecasting made from the simple barometric reading.
- Q.24 State and explain the hydrostatic equation. Give the vertical atmospheric pressure distribution.
- Q.25 What is isobar? What is its use. Give the horizontal pressure distribution on the global surface.

- Q.26 Explain isobaric slope and pressure gradient
Describe diurnal variation in atmospheric pressure
- Q.27 What are cyclones & anticyclones ?
Give the characteristics with respect to pressure distribution temperature distribution rainfall, wind, cloud distribution
- Q.28 What is eye of the cyclone ? How the cyclones and anticyclones are related with each other ?

(UNIT V) : ATMOSPHERIC MOTION : WIND

- Q.29 Define wind. Leeward, windward, back and haul.
Explain why the winds are generated relating temperature and pressure with the help of diagram.
- Q.30 What is subsidence and divergence of wind ? Describe with diagram Robinson cup anemometer with its use in measuring wind velocity
- Q.31 Explain the various forces acting on air particle producing wind. Draw necessary diagram.
Explain Coriolis effect with diagram
- Q.32 What is pressure gradient force ?
- Q.33 What is centrifugal force ? Explain the formation of gradient wind
- Q.34 What is Beaufort scale ? Give its use.
- Q.35 What do you mean by surface winds ? Explain with the diagram the regular planetary wind system of the Earth.
- Q.36 What is "roaring forties" ? What are units for measurement of wind velocity. Write short note on land and sea breeze.
- Q.37 Write short notes on -
1. Mountain and Valley breeze 2 Fohn and Chinook winds 3. Tornadoes
- Q.38 Write a note on "Indian Monsoons"
- Q.39 What is Isotach? Define gale, storm and hurricane ?
What are jet streams ?
- Q.40 Explain schematically the diurnal variation of wind.

(UNIT VI) : HUMIDITY

- Q.41 Define, partial vapour pressure, dew point and saturated vapour pressure. Describe any hygrometer with suitable diagram for use for measuring humidity.
- Q.42 Define Relative Humidity, Absolute humidity, specific humidity and mixing ratio.
Give construction and use of any hygrograph with diagram
- Q.43 Explain the periodic or diurnal variation of relative humidity and absolute humidity and relative humidity.
- Q.44 If the temperature of air is 16.5°C and the dew point 63°C , find the percentage of Relative humidity of air. (Give SVP at 6° , 7° , 16° and 17°C are respectively 7.05, 7.51, 13.62 and 14.42 mm of Hg)
"Write in brief about diurnal variation of absolute humidity and relative humidity.

(UNIT VII) : CONDENSATION AND PRECIPITATION

- Q.45 Define and differentiate between condensation and sublimation.
Give the conditions for occurrence of condensation in atmosphere
- Q.46 What is condensation ? Describe in brief about each form of condensation.
- Q.47 Differentiate between dew and frost. What are the conditions necessary for the occurrence of dew ?
- Q.48 Differentiate between condensation and precipitation.
- Q.49 Enlist the mechanisms of rainfall formation and describe in detail the Bergeron-Findison mechanism of rain formation.

- Q.50 Differentiate between 'Fog' and 'smog'.
Explain collision and coalescence mechanism of rain formation.
- Q.51 What do you mean by Hailstorm? Give and describe in brief various types of precipitation.
- Q.52 What are the different types of thunderstorm.
Explain the formation of thunderstorm (with diagrams giving various stages of its life cycle).
- Q.53 Differentiate between Haze and Fog.
Explain automatic rain gauge. How it is superior to simple rain gauge?

(UNIT VIII) : CLOUDS

- Q.54 What is the importance of clouds in forecasting of weather?
Give WMO cloud-classification.
- Q.55 Which clouds give precipitation?
What is "Cool cloud" and "Warm cloud"? Give the cloud genera.

(UNIT IX) : SOLAR RADIATION

- Q.56 Define and differentiate between radiation and insolation. Give the significance of radiation in Agriculture.
- Q.57 Define electromagnetic spectrum, solar constant.
State various factors affecting radiation receipt on the earth surface.
- Q.58 Differentiate between solar radiation and terrestrial radiation. Give radiation budget of the Earth-atmosphere system.
- Q.59 What are diffused, direct and global radiation.
Explain Angstroms equation with its use.
- Q.60 Give various units for measurement of radiation, and intensity.
State and explain Energy balance equation in the field with various components.
- Q.61 Give various instruments name used for the measurement of radiation. Explain greenhouse effect in the atmosphere.
- Q.62 Give Stefan-Boltzmann's Law and Wien's displacement Law.
Define albedo and state its values for Earth, Vegetative and water surfaces.
- Q.63 What is scattering? Give Kirchhoff's Law. Explain variation of annual insolation with latitude.
- Q.64 Define Absorptivity and Emmissivity. What do you mean by Black body, White body and Grey body?
Give diurnal insolation variation with schematic diagram.
- Q.65 Define Agroclimatic zone. State and describe various Agroclimatic zones of Maharashtra.
What is the significance of Agroclimatic zone?
- Q.66 Define Agro-Eco region and Agro climate zone.
State and describe various agroclimatic zones of Maharashtra.

(UNIT X) PHYSICAL CLIMATE, WATER BALANCE, DROUGHT, CLIMATOLOGY.

- Q.67 What is "degree of continentality"?
State the effect of various climatic controls.
(Latitude, Altitude, Water, Land, Monsoon winds) on the physical or solar climate.
- Q.68 Define and differentiate between evaporation and Evapotranspiration. State the various factors on which evaporation and evapotranspiration depends.
- Q.69 What is potential and actual evapotranspiration? Describe Lysimeter for its use in measuring evapotranspiration.
- Q.70 What is water balance equation? Give field water balance equation for a field with specified boundaries. State various applications of water balance equation.
- Q.71 Explain with diagram the hydrological cycle.
- Q.72 What is drought? Give definitions of drought for Meteorological, Hydrological and Agricultural purposes.
- Q.73 Define drought and classify them on the basis of time of occurrence and period.
- Q.74 Give definition of drought by Ramdas (1950).
What are soil and atmospheric droughts?



ATMOSPHERE

Q.1 Fill In the blanks :

1. Atmosphere is considered as basic Resource
2. Atmosphere fulfills the biological 62 demand of animals.
3. Sowing should be normally undertaken when rainfall (P) is greater than 1/2 potential
4. The instantaneous physical state of the atmosphere at particular place is called weather
5. Climate is generalised weather
6. Weather or climate is a resource
7. Agrometeorology considers crop-climate relationship.
8. Meteorology considers atmosphere and its phenomena.
9. Most of the meteorological phenomena like cloud, rain, lightening occur Within the height of 30 km.
10. Agrometeorology helps in developing a stable and sustainable agri production system

Q. 2 State True/False

1. Rainfall greater than 75 mm needs to be reported as it can cause disruption in communication due to flooding. ✓
2. Meteorology is a branch of physics. ✓
3. Weather elements and climatic controls are one and same. ✗
4. Climate is not a factor in soil formation. ✓
5. Weather decides the crop yield in a given season. ✓
6. Equinoxes are the periods during which day and night are equal. ✓
7. Microclimate is the climate of small region like a paddy field. ✓
8. Meteorology considers synoptic weather while climatology considers long term weather. ✓
9. Agrometeorology is a branch of meteorology and intends to increase food production. ✓
10. Agrometeorology includes the study of the response of crops, animals, fruit Crops and forest to weather. ✓

ATMOSPHERE

Q. 3 Fill In the blanks.

1. The mass of the atmosphere is 5.6 x 10¹⁹ metric tonnes.
2. The height of the atmosphere is 900 km.
3. The maximum proportion of water vapour in the atmospheres never exceeds 1.
4. The solid impurities dispersed in the atmosphere are called aerosols.
5. The normal composition of atmosphere remains constant up to the height of 88 km.
6. Atomic oxygen layer extends from 115 to 965 km.
7. The ozonosphere extends 15 to 25 Km with highest concentration between from 22 to km.
8. The lowest temperature that reaches in troposphere is -60 °C.
9. The highest temperature that reaches in the stratosphere is 0 °C.
10. Stratopause is the thin isothermal layer which separates stratosphere from mesosphere

Q.4. State True or False :

1. The proportion of Argon gas in air is more than that of carbon-di-oxide. ✓
2. The constituent gases of atmosphere react chemically to form compounds. ✗
3. Proportion of ozone increases with height. ✓
4. Proportion of dust, CO₂ and H₂O vapour decreases with increase in height. ✓
5. In heterosphere the distribution of gases is governed by gravitational field. ✓
6. Half of the total gas of the atmosphere exists between 3.6 miles or 5.5 km height. ✓
7. In troposphere temperature increases with height. ✗
8. Aurorae is the phenomena which occur in polar region due to excitation of ionosphere. ✓
9. Chloro-flouro-carbons combine with ozone to deplete it. ✓
10. Meteors burn at 80 km height in mesosphere. ✓
11. Ultra-violet rays from the sun being harmful to the plant and animal life are absorbed by ozone. ✓

AIR TEMPERATURE Q.5 Fill in the blanks :

1. The maximum temperature occurs during _____ to _____ hours while the minimum temperature occurs just about _____ in diurnal temperature cycle.
2. The delay in time to reach maximum temperature is called _____.
3. The line on the map joining different places having equal temperatures is called _____.
4. Any change in pressure, volume and temperature which takes place without addition or subtraction of heat is called _____ changes.
5. The value of DALR = _____ °C/km and SALR = _____ °C/km.
6. The air which resists any vertical motion is called _____.
7. The atmosphere gets heated by 1. _____ 2. _____ 3. _____ 4. _____ processes.
8. O_3 , CO_2 , H_2O vapour absorb _____ in the upper atmosphere.
9. Condition for dry air stability is DALR _____ and condition for absolute stability _____.

Q.6 State True or False :

1. Air is a poor conductor of heat and poor radiator of heat.
2. SALR is reversible.
3. Psychrometers measure real air temperature as well as humidity.
4. Thermograph is an accurate instrument used for continuous record of air temperature.
5. The temperature on globe increases with increase in latitude.
6. The difference between the highest and lowest temperature for a given period is called range.
7. Soil has got lowest specific heat and therefore it warms quickly compared to air and water.
8. The various conditions for dry air ascent are.... DALR > ENLR for Stability and OALR < ENLR for instability.
9. SALR is greater than DALR.
10. Conditional instability results when DALR > ENLR > SALR.

ATMOSPHERIC PRESSURE 0.7 Fill in the blanks :

1. The rate of change of atmospheric pressure per unit horizontal distance between two points at the same elevation is called _____.
2. For continuous record of atmospheric pressure, the instrument used is called _____.
3. The low pressure center enclosed with circular or oval isobars is called _____.
4. In diurnal normal pressure variation two maxima at _____ and _____ hours and two minima at _____ and _____ hours are observed.
5. The pressure decreases on an average at the rate of 34 mb per every _____ meter height.
6. The central region of cyclone with calm air, no cloudiness, no precipitation is called _____.
7. Cyclones and anticyclones are _____ of each other.
8. The low pressure belt at the equator is called _____.
9. The standard international unit for pressure is _____.
10. Horse Latitude is the high pressure area lying between _____ to _____ latitude in each Hemisphere.
11. At poles, there is vaguely distributed _____ pressure area.

Q.8 State True or False :

1. Falling barometer indicates rain or storm.
2. Altimeter is used to measure height of a place.
3. On isobaric surface, all the points with different heights have the equal pressure.
4. Depression is low pressure centre with circular isobars but wind velocity is less than 34 knot.
5. Temperate cyclones are more intense compared to tropical cyclones.
6. Two isobars cross each other.
7. The barograph is accurate instrument for atmospheric pressure measurement and does not require initial standardisation.

atmospheric pressure measured is corrected for temperature, gravity and altitude.
 Standard atmospheric pressure is given at mean sea level, at 45° N and at 30° K temperature.
 Density of air increases with increase in height.

Q.9 Fill in the blanks :

1. The pressure gradient produces wind while pressure and temperature are _____ related producing pressure gradient.
2. The winds are turned towards the low pressure and flow across the isobars at an angle of _____ on sea but at 30° on land due to high friction.
3. The Coriolis force is due to earth rotation and all winds in Northern hemisphere move towards _____.
4. The geostrophic wind flows in straight line when Coriolis force is counter balanced by _____ force.
5. Gradient wind is resulted when pressure gradient force is counter balanced by Coriolis force and _____ force.
6. In Northern Hemisphere, Cyclones rotate in _____ direction and anticyclones in _____ direction.
7. The direction from which wind blows is called _____ while the direction to which it flows is called _____.
8. Anemometer measures both _____ and _____ of wind.
9. The line joining places of equal wind velocity on map is called _____.
10. The wind in diurnal variation has maximum speed in early afternoon and the minimum speed in early _____ before sunrise.
11. The westerlies being violent in southern Hemisphere between 40° to 65° S produces large noise on the ocean due to water movement and are called _____ furries.
12. The SW monsoon gives rains to _____ % area of India.
13. Wind velocity is measured in Knot and 1 Knot = _____ Kmph.

Q.10 State True or False :

1. There is only one monsoon in India.
2. Winds above 1000 meter are geostrophic in nature.
3. Wind, temperature and pressure are not related with each other.
4. Beaufort scale is used to estimate wind-velocity from the effect produced by wind on surrounding objects.
5. Local winds are generated due to unequal cooling and heating of land and water surfaces.
6. Tornadoes are the smallest eddy, most violent and destructive winds with velocity greater than 500 mph.
7. Trade winds flow from Horse latitude to equatorial low in NE direction in Northern Hemisphere and are constant in force and direction.
8. Sea-breeze in summer brings cool and refreshing air from the sea to the land.
9. The winds are named by the direction from which they are flowing.
10. NE-monsoon gives rains to Colmbtore, Pondecheri, parts of Andhra, Karrataka and Tamilnadu state.

Q.11 Fill in the blanks :

1. Saturation Vapour pressure of air increases with increase in _____.
2. Most of the water vapour decreases with height and atmospheric moisture exists below _____ meter height.
3. Water vapour when mixed with dry air, humid air becomes _____ than dry air.
4. Relative humidity indicates the _____ of saturation of air at a given temperature with water vapour.
5. Presence of water vapour in grams per Kilogram of air gives us _____ humidity.

6. Absolute humidity is measured with hygrometer.
7. Mass of water vapour in grams mixing with one gram of dry air gives ratio.
8. Relative humidity is at equator.
9. The absolute humidity is at equator and decreases with latitude.
10. Changes in hair length are proportional to changes in and this principle is used in hair hygrometer.

Q.12 State TRUE OR FALSE :

1. Water vapour is heavier than air.
2. Relative humidity is maximum in the (sunrise) morning and minimum in afternoon (14 to 15h).
3. Hygograph records relative humidity correctly.
4. There is no regular variation of absolute humidity with height.
5. Absolute humidity is minimum at sunrise and maximum in afternoon between 14-15 hours.
6. At the same temperature below 0°C, there will be more evaporation from liquid water compared to solid ice.
7. Dew point temperature is always 0°C.
8. Evaporation is heat giving process.
9. Relative humidity of saturated air is 100%.
10. Absolute humidity conveys the actual content of water vapour and not relative.

CONDENSATION AND PRECIPITATION

Q.13 Fill in the blanks :

1. Fog appears when the wind is calm and relative humidity is at least %.
2. Mist is less dense
3. Raindrops have diameter from 0.5 mm to mm.
4. The line on the map joining different places with same precipitation is called
5. Rainfall associated with hail stones is called
6. Precipitation of half frozen rain drops is called
7. There are two processes of cooling 1. and 2.
8. Bombay, Mahabaleshwar, Per, Roha lie on the wind ward side in western Ghats and receive type rainfall.
9. Instrument used for continuous record of rainfall is called
10. Thunderstorm are of two types. 1. and 2.

Q.14 State TRUE OR FALSE

1. To form one rain drop about 1 million cloud particles need to be united.
2. Snow consists of ice crystals.
3. Hail is a form of solid precipitation of ice-lumps.
4. In mature thunder-storm, there are warm updraft in the back and cool downdraft in the front.
5. Drizzle is a precipitation of extremely (0.5 mm) small and numerous drops from nimbostratus cloud.
6. In sublimation, the water vapour is directly converted into ice crystals without intervening the liquid state.
7. Dew is formed when dew point is below 0°C.
8. Fog is a form of precipitation.
9. Dew appears when sky is cloudy.
10. Presence of hygroscopic nuclei is necessary for precipitation.
11. Thunderstorm is local atmospheric disturbance.
12. Dew appears when air is saturated with water vapour.
13. Frost is injurious to the crops.
14. In collision and coalescence mechanism a rain drop grows by collision and combination with other drops during updraft or downdraft.
15. In Bergeron - Findeisen mechanism a rain drop grows by vaporization from a liquid water droplet and subsequent condensation on ice crystals.

CLOUDS

Q.15 Name the following clouds

1. Cloud producing continuous precipitation.
2. Thunderhead cloud, chief precipitation maker.
3. Cloud giving dirzzla.
4. Fair weather cloud.
5. Cloud producing halo
6. Cloud producing corolla
7. Rippled cloud, forerunner of cyclonic storm
8. "Sheep back" cloud.

SOLAR RADIATION

Q. 16 Fill in the blanks :

1. Incoming solar radiation reaching earth's surface is called ____.
2. Photosynthetically active radiations are the real source of energy for ____ process in the plants.
3. Sun gives out energy ____ calories / minute.
4. The solar spectrum ranges from 0.15 - 4.0 micron and radiations are termed ____ radiations.
5. Earth and atmosphere give out radiations between 4-100 microns and are termed as ____ radiations.
6. The value of solar constant is ____ watt per square meter.
7. The total of direct beam solar radiation and diffused sky radiation is called ____.
8. The difference between the total incoming radiation and outgoing radiation is called ____ radiation.
9. The solar insolation on the earth surface ____ with increase in latitude.
10. The long wave radiations emitted by the earth are absorbed by ____ gases in the atmosphere.

Q. 17 State TRUE OR FALSE :

1. Out of 100% solar energy, about 47% of energy is absorbed by earth's surface.
2. The one way traffic of radiations so that short waves from the sun are admitted from atmosphere but the long waves from the earth are not allowed to escape is called green house effect.
3. The atmosphere allows to pass solar radiations through it.
4. Albedo is the ratio of reflected radiations to the total incident radiations on the surface.
5. All radiations received before sunrise and after sunset are diffused radiations.
6. Campbell stokes sunshine recorder measures solar radiation.
7. The sky appears blue due to scattering of light.
8. Albedo of the earth is 35%.
9. Black body absorbs all radiations falling on it.
10. Visible light has got wave length 0.15 - 4.0 microns.

CLIMATIC ZONES

Q.18 Fill in the blanks :

1. Köppen divided the climates on the basis of temperature into ____ primary categories.
2. Climates with coldest month temperature greater than 18°C is designated ____ climate.
3. Climates with annual precipitation greater than annual evaporation are ____ climates.
4. Climates with annual precipitation less than annual evaporation are ____ climates.
5. Arctic climate has warmest month temperature below ____ °C.
6. Thornthwaite (1931) defined P-E ratio as monthly precipitation divided by monthly ____.
7. Thornthwaite (1931) on the basis of PE and TE ratios and seasonal concentration divided the climates of the world into ____ climatic types theoretically.
8. The climates of AKOLA, NAGPUR, RAHURI, PUNE are ____ while of DAPOLI is ____ according to Koppens classification.
9. According to Hargreave, Arid climates are the regions with Moisture Availability

agricultural drought.

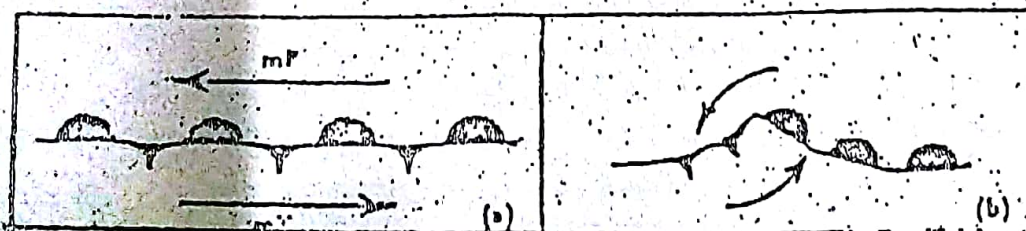
7. Atmospheric drought may occur even when there is sufficient rainfall and soil moisture.
8. Atmospheric drought remains many times unnoticed
9. Period with rainfall departure -11 to -25% is called slight drought.
10. Period with rainfall less than 75% of normal rainfall is meteorological drought.

Q.22 Give reasons for the following :

1. SALR is lower than CLAR
2. Dew and frost are not the forms of precipitation.
3. The door of Stevenson's screen always opens towards the north
4. On the cloudy day fog does not appear.
5. Fog disappears as soon as the sun rises
6. In Fortin's barometer, the lower tip of the ivory pointer must always touch the mercury in cistern vessel before taking observation.
7. In land breeze, the wind flows from land to sea
8. DB thermometer and wet bulb thermometer show the same temperature at 100 per cent relative humidity.
9. Mountains are always colder.
10. SALR is not reversible but DALR is reversible.
11. For dew formation sky must be clear.
12. Frost is not frozen dew.
13. Hygroscopic nuclei are necessary for condensation to occur.
14. For fog formation, air must be calm.

Q.23 Differentiate between the following :

- | | |
|--|--|
| 1. Weather and climate, | 2. Meteorology and climatology |
| 3. Radiation and insolation | 4. Frost and dew |
| 5. Fog and cloud | 6. Fog and smog |
| 7. Hail and snow | 8. Cyclone and anticyclone |
| 9. Depression and cyclone | 10. Agroclimatic zone and agro-eco-region |
| 11. Continental climate and marine climate | |
| 12. Orographic precipitation and convectional precipitation | |
| 13. Stability and instability | 14. Evaporation and Evapotranspiration |
| 15. Actual evapotranspiration and potential evapotranspiration | |
| 16. Dry air and wet air | |
| 17. Mean temperature and average temperature of air. | |
| 18. Temperature of air and its potential temperature. | |
| 19. Hurricane and storm. | 20. Breeze and Gale |
| 21. Lapse rate and inversion | 22. Condensation and precipitation. |
| 23. Sea breeze and land breeze | 24. Relative humidity and absolute humidity. |



DEFINITION GLOSSARY

1. **Meteorology** is a science of atmosphere and its various phenomena including weather and climate. (1991, 1992).
2. **Potential temperature** is the temperature of an air parcel at some height brought dry adiabatically to sea level or 1000 mb pressure. (1991).
3. **Solar constant** is defined as the energy received by one square centimeter area in one minute at the top of the atmosphere, held perpendicular to incident solar beam at the earth's mean distance from the sun. Its value is $2.0 \text{ Cal/cm}^2/\text{min}$ or 1400 Watt/m^2 (1991, 1995).
4. **Isohyet** is the line on the map joining different places of equal rainfall or precipitation. (1991).
5. **Dry Adiabatic Lapse Rate (DALR)** is defined as the rate of decrease in temperature of dry or unsaturated air with increase in height due to adiabatic cooling when it moves upward $\text{DALR} = 9.8^\circ\text{C/KM}$ (1991, 1994).
6. **Precipitation** is defined as earthward falling or deposition of water drops or ice particles, both that have formed by condensation in the atmosphere. (1991, 1992).
7. **Trade winds** are regular surface winds of earth's general circulation which flow from high pressure belt (25° - 35°) towards equatorial low pressure region. There are N-E and S-E trade winds in Northern and Southern hemispheres respectively. (1992).
8. **Frost**: When the temperature of air falls below 0°C before the dew point is reached, the water vapour is directly converted into ice crystal. Thus this condensation product obtained by sublimation is called frost. (1992).
9. **Troposphere** is the layer surrounding the earth wherein temperature decreases with increase in height. Many meteorological phenomena take place in this sphere. Its height on the equator is 16 Km. (1992), (1993).
10. **Potential Evapotranspiration (PET)** is the amount of water transpired in unit time by short green crop of uniform height completely shading the ground and never short of water. PET indicates maximum possible moisture loss by a crop (1991, 1994).
11. **Isobar** is the line on the map which joins the different places having equal atmospheric pressure. (1991), (1992, 1995).
12. **Dew Point** is defined as the temperature at which the air is just saturated with water vapour and the invisible moisture begins to condense into visible form like tiny water droplets (1990), (1992), (1994).
13. **Lapse rate** is the rate of decrease in temperature with increase in height from the ground surface, (1990), (1992), (1994).
14. **Insolation** is defined as Incoming Solar radiation received at the horizontal surface of the earth (1990, 1992, 1992 R).
15. **Net Radiation** is defined as the difference between the incoming and outgoing radiations (1992) (1993).
16. **Evapotranspiration (ET)** is defined as the loss of water by transpiration from the plant surfaces and by evaporation from the soil underneath the plant. It expresses combined loss of water by evaporation and transpiration.
17. **Drought year** is the year in which actual rainfall is short by more than twice the deviation for a given place eg. If the normal rainfall is 1000 mm normal, deviation is 150 mm. then if the rain fall received in a year is 700 mm. then the year would be a drought year (1992), (1993).
18. **Gradient wind** may be defined as the wind that results when the balance is obtained between pressure gradient force on one hand and the coriolis and centrifugal force on the other hand. Thus, in gradient wind. $\text{Pressure gradient force} = \text{coriolis force} + \text{centrifugal force}$. (1994).

19. **Mesopause** is the thin isothermal layer which separates mesosphere from thermosphere (1994).
20. **Equinox** indicates the time or situation during which day and night are of equal duration. There are two equinoxes: spring equinox on 21 March and autumn equinox on 22 September (1994).
21. **Emissivity (E)** is defined as the ratio of the radiant energy emitted (E_s) by a surface at a specified wavelength and temperature to the radiant energy emitted by an ideal black body (E_b) at the same wavelength and temperature $E = E_s/E_b$. (1994, 1992) (1993).
22. **Agricultural Meteorology** is a branch of pure meteorology defined as the science investigating meteorologic, climatic and hydrologic conditions which are significant to agriculture owing to their interaction with the object and processes of agriculture. It studies mainly crop-climate relationship. (1995).
23. **Environmental lapse Rate (ENLR)** is the rate of decrease of temperature with increase in height in the surrounding environment of the air parcel subjected to upward displacement. (1995).
24. **Isotach** is the line on the map joining different places with equal wind speed (1995).
25. **Kirchoff's Law**: The law states that absorptivity [$\alpha(\lambda)$] of a body for radiation is equal to its emissivity $E(\lambda)$ for the same wavelength. Thus $\alpha(\lambda) = E(\lambda)$ (1992).
26. **Solar radiation**: The heat energy given out by the sun in the form of electromagnetic waves travelling with the speed of light is known as solar radiation. (1992).
27. **Atmospheric processes**: The various processes such as mass, energy and momentum exchanges etc. which occur in the atmosphere are called atmospheric processes (1992).
28. **Adiabatic process**: Any process which takes place without addition to or subtraction of heat from the system is known as adiabatic process. Any change in volume, pressure and temperature occurring without addition or subtraction of heat is called adiabatic change and the process is known as adiabatic process.
29. **Albedo** is a ratio of the radiations reflected by a surface to the total radiation's incident on it. The Albedo of the earth, vegetation and water bodies are 35%, 25% and 5% respectively (1994).
30. **Isothermal process**: Any process which takes place at constant temperature by loss or gain of heat is called isothermal process. Air parcel moving upward at constant temperature may gain (or lose) heat from (to) the surrounding air (1993).
31. **Black body**: A body which absorbs all the radiant energy incident on it is called Black body. The radiations emitted by black body are called black body radiations.
32. **Isotherm** is the line on the map joining different places having equal air temperature (1990).
33. **Fog** is a condensation product consisting of extremely small water droplets suspending near the ground and restricting horizontal visibility. It is a cloud on the ground. (1990).
34. **Leeward** - Direction to which the air flows (1991).
35. **Wind** is horizontal flow of air (1991). *in motion*
36. **Temp. Inversion** - Increase in temp, with increase in height (1994).
37. **Weather** is instantaneous physical condition of atmosphere (1994).
38. **Climate** is statistical average of day to day weather conditions (1994).
39. **Atmosphere** is gaseous envelope surrounding the earth. (1990, 1993).
40. **Hail** is solid precipitation in the form of ice-lumps. □□□

$$S_{mog} = S_{maak} + fog$$

[vii]