3. Atmosphere

Exercise

1 A. Question

Choose The Best Answers:

_____ is the most important gas for the survival of living organisms.

A. Helium

B. carbon-di-oxide

C. oxygen

D. methane

Answer

Oxygen is the most important gas for the survival of the living organisms because we need oxygen for breathing and oxidizing the food that we eat and in the process of cellular respiration through which energy is released.

1 B. Question

Choose The Best Answers:

The lowest layer of the atmosphere is _____

A. Troposphere

B. Stratosphere

C. Exosphere

D. Mesosphere

Answer

Troposphere is the lowest layer of the atmosphere which extends up to 8 kilometres at the pole and up to 18 kilometres at the equator. Almost all the weather phenomenon take place in this layer hence we experience changes in weather conditions.

1 C. Question

Choose The Best Answers:

_____ reflects radio waves.

A. Exosphere

B. Ionosphere

C. Mesosphere

D. Stratosphere

Answer

The ionosphere reflects radio waves because of the presence of ionized gas particles in the ionosphere carrying an electrical charge. The ionosphere is the layer which includes the thermosphere and the part of mesosphere and exosphere.

1 D. Question

Choose The Best Answers:

The average global surface temperature is _____

A. 12°c

B. 13°c

C. 14°c

D. 15°c

Answer

Although the temperature varies from place to place and season to season and continent to continent the average global surface temperature is 13 degrees Celsius. The study conducted on global temperature has shown that the average temperatures have increased in the year 2017.

1 E. Question

Choose The Best Answers:

Temperature _____ from the equator to pole.

A. Increases

B. no change

C. decreases

D. stable

Answer

As we move away from the equator to the poles, the temperature decreases progressively because on the equator sun is very close to the surface of the earth and thus heat is more. As we move towards equator the distance of the

sun from the surface of the earth increases and the direct sunlight decreases leading to a decrease in the temperature.

1 F. Question

Choose The Best Answers:

The process of change of state of water from gaseous to liquid state is called _____

A. Precipitation

B. evaporation

C. transpiration

D. condensation

Answer

Condensation is the process of change of state of water from gaseous to the liquid state. It is the reverse of vaporization. This is one of the stages in the water cycle which causes precipitation.

Transpiration is the process of conversion of water to the gaseous state from the surface of the green leaves.

1 G. Question

Choose The Best Answers:

The _____ is the chief energy source of the Earth.

A. Sun

B. Moon

C. Stars

D. Clouds

Answer

The sun is the chief and primary source of energy for the earth. The solar energy from derived from the sun warms up the climate of the earth and makes life possible on the earth. It is naturally used up by the living organisms.

1 H. Question

Choose The Best Answers:

The _____ pressure belt extends from 5°N and 5°S latitudes.

A. Equatorial low

B. Subtropical high

C. sub-polar low

D. polar high

Answer

The equatorial low belt extends from 5 degrees North and 5 degrees South latitudes. It is one of the seven pressure belts present in the atmosphere of the earth. Since the vertical rays of the sun fall on the earth, the heat is intense and the temperature is high.

1 I. Question

Choose The Best Answers:

All types of clouds are found in the _____

A. Troposphere

B. Ionosphere

C. Mesosphere

D. Exosphere

Answer

The three layers of the atmosphere such as troposphere, stratosphere, and mesosphere are specific locations of the clouds but troposphere is the only sphere which contains all clouds which is the lowest layer in the atmosphere.

1 J. Question

Choose The Best Answers:

_____ clouds are called 'Sheep clouds'

A. Alto-cumulus

B. Alto-Stratus

C. Nimbo-stratus

D. Cirro-stratus

Answer

Alto stratus clouds are called ‘sheep clouds’ or ‘wool pack clouds’. It is the middle altitude cloud genus which belongs to the stratiform physical category characterized by a generally uniform gray to bluish-green sheet or layer.

1 K. Question

Choose The Best Answers:

The Monsoons are _____

A. Prevailing winds

B. Periodic winds

C. local winds

D. none of the above.

Answer

Monsoon is an example of periodic winds. Periodic winds change their direction periodically with the change in season. Winds which reverse their direction with the change of season are called monsoons.

1 L. Question

Choose The Best Answers:

Dew in the form of ice crystals is called_____

A. frost

B. fog

C. mist

D. sleet

Answer

Frost is a thin white layer of ice on a solid surface which is formed from water vapor in an above freezing atmosphere coming in contact with a solid surface whose temperature is below freezing.

1 M. Question

Choose The Best Answers:

The vertical movement of air is called _____

A. Wind

B. storm

C. Air current

D. drift

Answer

The vertical movement of air is called the air current. The air currents occur mainly due to differences in temperature and/or pressure. These are found

not only in the troposphere but also extend to the stratosphere and mesosphere.

Wind is the horizontal movement of the air.

2. Question

Match the following:

1. Meteorology	wind speed
2. Climatology	direction of wind
3. Anemometer	cirrus
4. Wind Vane	study of climate
5. Mare's Tail	study of weather
6. Leeward side	Australia
7. Willy Willy	rain shadow region

Answer

1. Meteorology –study of weather

Explanation: It is the branch of atmospheric sciences which includes atmospheric chemistry and atmospheric physics with a major focus on weather forecasting or prediction. The word is derived from a Greek word which means “the study of the things high in the air”.

2. Climatology-study of climate

Explanation: Climatology is the scientific study of climate averaged over a period of time. It is also known as climate science. It studies the weather

patterns and the systems that cause them.

It is different from meteorology as it examines long-term patterns and trends as compared to that of short time period observed by meteorologists.

3. Anemometer- wind speed

Explanation: Anemometer is an instrument or a device used for measuring the speed of the wind or of any current of gas. It is also a common weather station instrument. It is used in meteorology. It is also called wind speed meter or wind meter.

4. Wind Vane-direction of the wind

Explanation: Also known as weather vane or weathercock, it is an instrument which shows the direction of the wind. It is placed at the top or at the highest point of a building. The direction in which the arrow is pointing indicates the direction from which the wind is blowing.

5. Mare's tail-cirrus

Explanation: Cirrus clouds are called mare's tail because during sunset they look colorful and very beautiful. These clouds resemble a horse's tail due to their long thread-like patterns. These clouds are composed of tiny ice particles.

6. Leeward side-rain shadow region

Explanation: the rain shadow region is a dry area on the leeward side of the mountainous region which receives less rainfall than the region windward of the mountains. The mountains block the passage of the winds and cast a shadow of dryness behind them.

7. Willy Willy-Australia

Explanation: Willy Willy is the name of a tropical cyclone or a wind whirl in Australia. There are different names by which a cyclone is called in different regions for example cyclones in the Middle East and typhoons in Eastern Asia.

3 A. Question

Answer the following Questions Briefly:

Define atmosphere

Answer

The blanket of air that surrounds the earth is called atmosphere which is held close to the surface of the earth by gravitational force. The atmosphere of the earth protects life on earth by the harmful radiations of the sun like ultraviolet rays, greenhouse effect and also helps in reducing the temperatures extremes between day and night.

Composition: the three major constituents of the earth's atmosphere are nitrogen, oxygen, and argon. Water vapour accounts for roughly 0.25% of the atmosphere by mass.

3 B. Question

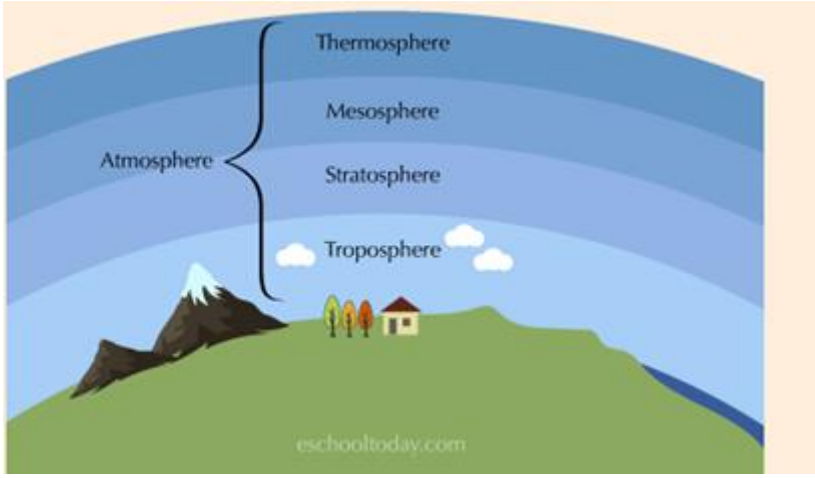
Answer the following Questions Briefly:

Name the different atmospheric layers

Answer

The five atmospheric layers are: Troposphere, stratosphere, Mesosphere, Thermosphere, and Exosphere. There are more layers than these five important layers. Magnetosphere lies beyond the exosphere and ionosphere which reflects radio waves because of the presence of ionized gas particles which includes the thermosphere and the part of mesosphere and exosphere.

The diagram shows the above-mentioned layers:



3 C. Question

Answer the following Questions Briefly:

Mention the factors that affect the climate?

Answer

There are many factors which affect the climate of a place. These are:

1. Distance from the equator

2. Altitude or Elevation

3. Nearness to the sea – as ocean currents affect the temperature

4. Latitude- climate depends on the distance of the latitude how far it is from the equator.

5. Nature of the prevailing winds and air masses- The direction that winds usually blow from.

6. Presence of a mountain barrier

7. Natural vegetation

8. Cloud cover

3 D. Question

Answer the following Questions Briefly:

What are the units used to measure the temperature?

Answer

Temperature is the measure of heat in the body. It characterizes the body as hot or cold. The basic unit of measuring temperature in the International system of the units is the Kelvin. It has the symbol **K**. Other units which can be used for everyday applications are Celsius (**C**), Fahrenheit (**F**). The instrument used for measuring temperature is called thermometer.

3 E. Question

Answer the following Questions Briefly:

What is insulation?

Answer

Insulation is the process of stopping the passage of heat or sound from one medium to another. Carbon dioxide acts as an insulator in the atmosphere. It absorbs heat and keeps the atmosphere warm by insulation and radiation. The purpose of insulation is to slow down the rate of heat transfer.

3 F. Question

Answer the following Questions Briefly:

What are isotherms?

Answer

Isotherms are imaginary lines drawn on maps which join the regions having equal temperatures at a given time or on the average over a given period. Isotherms are commonly used in meteorology to show the distribution of temperature at the earth's surface or on a chart indicating constant level or constant pressure. They are also used to show the time variation of the temperature with height in the atmosphere or with depth in soil or water.

3 G. Question

Answer the following Questions Briefly:

Write a short note on Lapse rate.

Answer

Lapse rate is the rate at which the temperature in the earth's atmosphere increases with a decrease in altitude or decreases with the increase in the altitude. The temperature decreases at the rate of 1° C for every 165 meters of height. This is called the normal lapse rate. Thus, the places at higher altitude have a lower temperature and the places at lower altitude have a higher temperature.

3 H. Question

Answer the following Questions Briefly:

What are the processes responsible for heating the atmosphere?

Answer

The energy reflected back towards the earth warms up the atmosphere causing the earth to emit more infrared radiation. This results in a cycle which keeps the atmosphere and warms. The gas carbon dioxide absorbs heat and keeps the atmosphere warm by the process of insulation and radiation. The heat of the sun which reaches on the earth is trapped by the sheet of carbon dioxide surrounding the surface of the earth and as a result of excessive CO_2, this whole process has resulted in the phenomenon of global warming which is fatal.

3 I. Question

Answer the following Questions Briefly:

How is the atmospheric Pressure measured?

Answer

The atmospheric pressure is the pressure exerted on the surface area by the weight of the air above the surface of the object. It is written as "atm". The "atm" unit is roughly equivalent to the mean sea level atmospheric pressure on the earth.

The most common way to measure atmospheric pressure is with the help of a barometer and the unit of measurement is Millibar (mb). It contains mercury. The air pressure pushes down on the surface of the mercury, making some rise up the tube. The greater the air pressure the higher the mercury rises.

3 J. Question

Answer the following Questions Briefly:

Polar Easterlies are cold and dry. Why it is so?

Answer

Polar easterlies are the cold and dry winds that blow from the polar high-pressure belt to subpolar low-pressure belt. They are formed as cold winds at the poles and begin to move or flow towards the equator. The winds are

freezing, cold and dry due to the location at high altitudes. This contributes to the polar climate which is characterized basically as icy and cold.

3 K. Question

Answer the following Questions Briefly:

Mention the Planetary wind system of the earth.

Answer

The pattern of winds developed in the atmosphere of the earth as a result of its rotation and the inclination of its axis toward the sun is called the planetary wind system. These winds include Tradewinds, Westerlies, and Polar Easterlies.

1. Tradewinds: These winds blow with regularity and consistency from the subtropical high-pressure belt to the Equatorial low-pressure belt in both the hemispheres.

2. Westerlies: These are the permanent winds that blow from the tropical high-pressure belt to the sub-polar low-pressure belt in both the hemispheres.

3. Polar easterlies: These are cold and dry polar winds that blow from the polar high-pressure belt to the sub-polar low-pressure belt.

3 L. Question

Answer the following Questions Briefly:

Write a short note on:

a. Tradewinds.

b. Roaring Forties

Answer

(a) Trade winds blow from the subtropical high-pressure belt to the Equatorial low-pressure belt in Northern and Southern hemisphere. They blow in a constant direction throughout the year and in a regular manner. These winds are named so because these are helpful for the traders while sailing in the sea. While travelling over the vast oceans these winds carry more moisture thus bringing heavy rainfall on the East Coast of the continents. They do not give any rainfall as they move westwards.

(b) Westerlies are the permanent winds which blow from South West to North East in the northern hemisphere and North West to South East in the southern hemisphere. The velocity of the westerlies becomes so fast and vigorous to be called as "roaring forties" at 40-degree latitude.

3 M. Question

Answer the following Questions Briefly:

How are clouds formed?

Answer

During the process of the water cycle the water vapour rises above the surface of the earth. Cool moisture-laden air gets collected around particles like dust, salt content from the sea, smoke etc., and forms clouds. So the clouds are formed when warm and moist air rises up, cools, and then expands in the atmosphere. The water vapour in the air condenses to form tiny water droplets which form the basis of the clouds.

3 N. Question

Answer the following Questions Briefly:

What are the different types of rainfall?

Answer

There are three different types of rainfall based on the mechanisms of raising the air. These are:

1. Convectional rainfall – The rainfall which is caused due to convectional air currents. During the day the land gets heated and the warm air above the hot land rises and expands. As the air rises, it cools and condenses. The process continues and rain occurs.

2. Frontal or cyclonic rainfall- the rainfall which occurs during a cyclone is called cyclonic or frontal rainfall as it occurs along the fronts of the cyclone. It is formed when the two masses of the air of different temperature, humidity and density meets.

3. Orographic rainfall- Also known as relief rainfall, it is caused when the air is forced to rise against a high mountain. As the air rises and cools, orographic clouds are formed and serve as the source of the precipitation.

3 O. Question

Answer the following Questions Briefly:

What is Precipitation? What are the different forms of precipitation?

Answer

Precipitation is the process of falling of water vapours in any form on the surface of the earth. When the dew point is reached in the cloud water droplets become saturated and start to fall.

The various forms of precipitation include:

1. Drizzle:

These are uniform minute droplets of water with a diameter of less than 0.5 mm.

2. Rain:

It is the most common form of precipitation. The diameter of a raindrop is more than 5mm.

3. Sleet:

It is precipitation in the form of pellets made up of transparent and translucent ice.

4. Snow:

It is formed when the temperature is below the freezing point. It is the precipitation of opaque and semi-opaque ice crystals.

5. Hails:

These are small hard balls of ice that fall from the sky.

3 P. Question

Answer the following Questions Briefly:

Write short notes on:

a. Drizzle

b. Rain

c. Sleet

d. Snow

e. Heat

Answer

a. Drizzle

These are uniform minute droplets of water with a diameter of less than 0.5 mm. it is light rainfall just like a thin stream of water. Drizzles combine with fog reduces visibility.

b. Rain

It is the most common and important form of precipitation

in the places having a temperature above the freezing point It occurs only when there is abundant moisture in the air. The diameter of a raindrop is more than 5mm.

c. Sleet

It is the form of precipitation which contains some ice. It occurs when the snow starts melting. It is a mixture of snow and ice. Generally, the transparent

ice pellets have a diameter of 5mm or 0.2 inches or less and that form as a result of the freezing of raindrops.

d. Snow

Snow is formed when condensation occurs below the freezing point. It is falling of frozen water or ice crystals on the surface of the earth and thus forming a white layer. Snow forms when tiny ice crystals stick together to become snowflakes.

e. Heat is a form of energy which makes the object hot. The temperature of the object to which the heat is supplied increases with an increase in heat energy. It becomes hot or warm. It is thus the flow of energy from one hotter object to the other cooler object.

3 Q. Question

Answer the following Questions Briefly:

How are Cyclones classified?

Answer

Cyclone is a weather phenomenon. These are centres of low pressure where winds from the surrounding high-pressure area converge towards the centre in a spiral form.

Cyclones can be classified into:

1. Tropical cyclones –

These cyclones develop in the Intertropical convergence zone [ITCZ]. They are formed due to the differential heating of land and sea. These are characterized by low-pressure centre a closed low-level atmospheric circulation and a spiral arrangement of thunderstorms that produce heavy rain.

2. Temperate cyclones –

Temperate cyclones are formed along a front where hot and cold air masses meet in mid-latitudes between 35° and 65°N and S in both the hemispheres. These are low-pressure areas which drive the weather over much of the earth.

3. Extratropical Cyclones –

Extratropical cyclones occur in the latitudes between 30° and 60° in both the hemispheres. They are also called “mid-latitude cyclones". Such cyclones produce mild showers to heavy gales, thunderstorms, blizzards, etc.

4 A. Question

Distinguish between the following:

Weather and climate

Answer

The following table shows the difference:

S. NO	WEATHER	CLIMATE
1.	Weather is the study of atmospheric conditions for short duration over small areas.	Climate is the study of the average weather condition observed over a long period of time for a larger area.
2.	The weather changes from hour to hour or day to day. It is temporary.	The climate remains the same over a large period of time. It is more permanent in nature.
3.	The data for weather is collected on every day.	It is an average of all the data collected on the weather.
4.	Study of weather is called Meteorology.	Study of climate is called Climatology.

4 B. Question

Distinguish between the following:

Insulation and temperature

Answer

The following table shows the difference:

S. no	INSULATION	TEMPERATURE
1.	Insulation refers to the protection of something or prevention of transfer of one energy to another.	Temperature refers to the degree or intensity of heat present in a substance.
2.	Insulation effects temperature. As the insulation increases the temperature also increases and vice versa.	Temperature does not affect insulation.
3.	Insulation is independent of temperature.	Temperature depends on insulation. The temperature increases with an increase in insulation and vice versa.

4 C. Question

Distinguish between the following:

Land breeze and sea breeze

Answer

The following table shows the difference:

S.no	LAND BREEZE	SEA BREEZE
1.	The wind blows from land to sea during the night, this is called a land breeze.	The wind blows from the ocean to land in the afternoon, this is called a sea breeze.
2.	This is predominant during the winter season.	It is more often experienced during the spring and summer season.
3.	It is also known as “off-shore wind”.	It is also known as “on-shore wind”.
4.	It comes from land.	It comes from water.
5.	It is a regular phenomenon in the equatorial region.	It is confined to coastal regions and lakesides.
6.	There is high pressure over the sea surface.	There is high pressure over the land.

4 D. Question

Distinguish between the following:

Windward side and Leeward side.

Answer

The following table shows the difference:

S. no	WINDWARD SIDE	LEEWARD SIDE
1.	It is that side of the mountain which receives heavy rainfall.	It is that side of the mountain which receives very little rainfall.
2.	This side comes across the striking winds and thus receives heavy rainfall.	This side is untouched where the winds descend after shedding much of the rainfall.
3.	Windward side gives a boost to the air and enhances precipitation.	The leeward side or the sheltered side encourage warm and dry climates.
4.	The North Western United States and the Front Range Foothills of Northern Colorado are examples of regions in the windward side.	The Mojave Desert and California's Death Valley are the two such rain shadow regions.

4 E. Question

Distinguish between the following:

Tropical cyclone and Temperate cyclones.

Answer

The following table shows the difference:

S. no	TROPICAL CYCLONES	TEMPERATE CYCLONES
1.	Tropical cyclones develop in the Intertropical convergence zone [ITCZ] due to the differential heating of land and sea.	Temperate cyclones are formed in mid-latitudes between 35° and 65°N and S.
2.	This cyclone is characterized by light wind and clear skies or light cloud.	These cyclones have rising air at the centre which results in clouds and rain.
3.	Tropical cyclones have strongest winds in the lower troposphere, near the top of the boundary layer.	Temperate cyclones have strongest winds at the top of the troposphere in the core of the jet stream.
4.	These cyclones have much more intense rainfall than temperate cyclones.	These cyclones tend to have much more moderate rainfall still destructive enough to cause flooding.
5.	The wind decrease with height.	The wind increase with height.

5 A. Question

Give reason:

The equatorial low-pressure belt is an area of calm.

Answer

The equatorial pressure belt is also called doldrums (the zone of calm) because of the virtual absence of surface winds. The doldrums are caused by heating up the atmosphere by solar radiation. The heating causes the air to warm and rise above instead of blowing horizontally over the surface of the water. Those winds are light, calm and thus unpredictable. These winds result in sudden occurring cyclones. Literally, the term "doldrums" means are a state of inactivity, mild depression or stagnation.

5 B. Question

Give reason:

Cyclones cause huge loss of life and property.

Answer

Cyclones are associated with the high pressure and strong winds. This, in turn, creates storm surges. This causes a rise in seawater level near the coasts.

The strong blowing winds may damage the life and property, dwellings, communication systems, trees, etc. Cyclones also bring heavy rainfall with them for consecutive days or a prolonged period which ultimately results in a flood like situation in the area struck by the cyclone. This results in submergence of low lying areas by rain and causes destruction and loss of life and property.

5 C. Question

Give reason:

Cloudy days are warmer than cloudless days.

Answer

The clouds in the atmosphere act as a barrier from heat. If the sky is clear the heat emitted from the earth’s surface feel free to escapes into the upper skies or space resulting in the cooler temperature. But when there is a cloudy sky, the clouds act as a barrier to the heat trying to escape and thus leading to a warmer atmosphere. The heat emitted from the earth’s surface is trapped by the clouds and reflected back to the earth’s surface.

5 D. Question

Give reason:

Fog is dangerous for traffic.

Answer

Fog is a visible aerosol consisting of minute water droplets or ice crystals suspended in the air at or near the earth's surface. In other words, fog can be considered as low lying clouds.

It is very difficult and dangerous to drive in the foggy atmosphere because of the lack of visibility or very low visibility. One should avoid going out for a drive on a foggy day. It is believed to be one of the most dangerous environmental hazards which results in road accidents and death on a large scale during the winter season. Invisibility can seriously deteriorate within a matter of seconds.

5 E. Question

Give reason:

Convectional rainfall is also called 4'0 clock rain.

Answer

Convectional rainfall occurs or develops as warm and moist air rises up and condenses. When the air near the earth surface is heated, it rises and expands. This heating results in the formation of convectional air currents which results in convectional rainfall.

The term convection means the vertical movement of heat due to solar radiations. The process of convection is more intense during the daytime or in the late mid-afternoon which is the warmest part of the day. The word 4'0 clock has no technical denotation but is just associated with the time at which the rate of convection is fastest.

5 F. Question

Give reason:

Polar Easterlies are cold and dry. Why it is so?

Answer

Polar easterlies are the cold and dry winds that blow from the polar high-pressure belt to subpolar low-pressure belt. They are formed as cold winds at the poles and begin to move or flow towards the equator. The winds are freezing, cold and dry due to the location at high altitudes. This contributes to the polar climate which is characterized basically as icy and cold.

6 A. Question

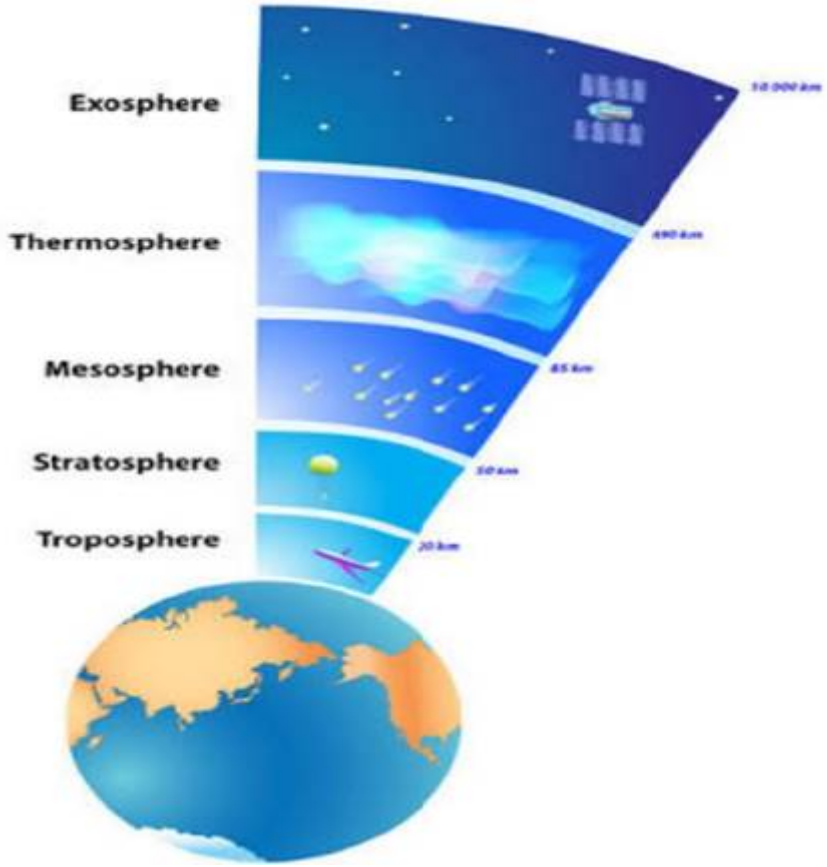
Paragraph Questions:

Write a paragraph about the structure of the atmosphere.

Answer

The blanket of air that surrounds the earth's surface is called atmosphere which is being held close to the earth by gravitational force. The atmosphere

is a mixture of gases, water vapour and dust particles in different proportions. Nitrogen and Oxygen are permanent gases of the atmosphere. The other solid particles that are present in the atmosphere include dust particles, salt particles, pollen grains, smoke, soot, volcanic ashes etc. The following diagram shows the layers in the atmosphere:



The structure of the atmosphere consists of five layers:

1. Troposphere:

This is the lowest layer of the atmosphere. It extends up to 8 kilometres at the poles and up to 18 kilometres at the Equator. It is called weather making layer because almost all the weather phenomena take place in his layer.

2. Stratosphere:

The layer lies above the troposphere. It extends to a height of about 50 kilometres above the surface of the earth. This layer is also called "ozonosphere" since this layer has a concentration of ozone molecules. Large jet planes normally fly here.

3. Mesosphere:

This layer lies above the stratosphere and extends between 50 kilometres and 80 kilometres. In the mesosphere, temperature increases as the altitude increases. Most of the meteors nearing the earth get burned here.

4. Thermosphere:

This layer exists above the mesosphere and extends up to 600 kilometres. Thermosphere also contains another layer called "Ionosphere" that contains

Ions and free electrons. The "Aurora" mostly occurs in this layer.

5. Exosphere:

This is the uppermost layer of the atmosphere. It is a thin layer where molecules are gravitationally bound to that body. It is same as the airless void of outer space.

6 B. Question

Paragraph Questions:

Explain the different types of Permanent winds.

Answer

The winds which constantly blow in the same direction throughout the year are called the Permanent winds. They are also called planetary winds or the prevailing winds.

There are three types of permanent winds:

1. Trade winds-Trade winds blow from the subtropical high-pressure belt to the Equatorial low-pressure belt in Northern and Southern hemisphere. They blow in a constant direction throughout the year and in a regular manner. These winds are named so because these are helpful for the traders while sailing in the sea

2. Westerlies-blow from the tropical high-pressure belt to the sub-polar low-pressure belt in both the hemispheres.

3. Polar Easterlies- Polar easterlies are the cold and dry winds that blow from the polar high-pressure belt to subpolar low-pressure belt. They are formed as cold winds at the poles and begin to move or flow towards the equator.

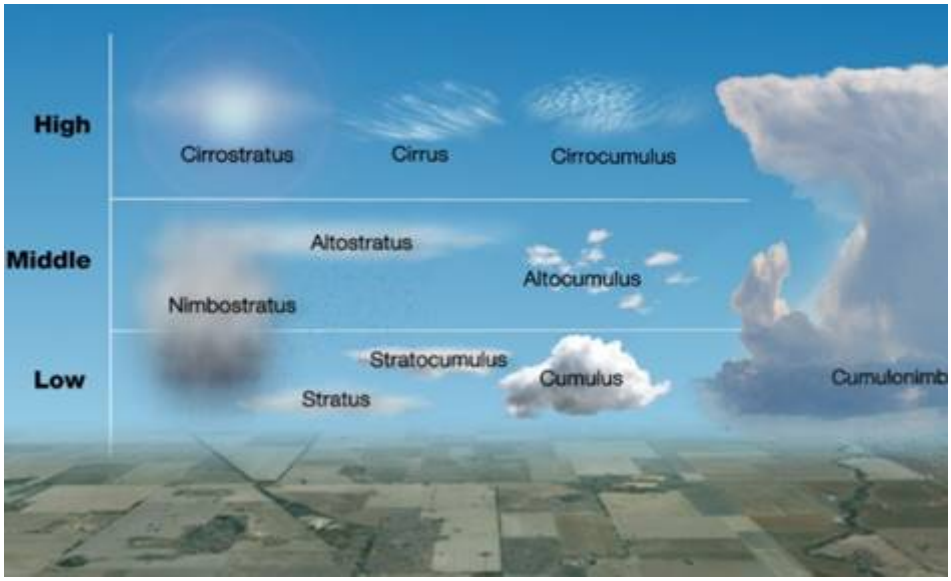
6 C. Question

Paragraph Questions:

How are clouds classified? Explain them.

Answer

Clouds are a type of aerosols consisting of minute liquid droplets frozen crystals or other particles suspended in the atmosphere of a planetary body. A visible mass of condensed water vapour floating in the air above the ground level is called a cloud.



The picture above shows the classification of clouds.

On the basis of height, clouds are classified into the following types:

•**<u>High clouds</u>** - The clouds present at the height of 6 to 20 kilometres. There are three types of high clouds:

1. Cirrus- These are present at the height of 8,000 to 12,000 meters in the form of white delicate fibrous silky filaments formed at the high sky.

2. Cirro-cumulus- these are composed of ice crystals and appear white patched, sheet or layer like.

3. Cirro stratus – These are also composed of tiny ice crystals and are smooth, milky and transparent.

•**<u>Middle clouds</u>** – These clouds are present at the height of 2.5 to 6 kilometers. The following are the types of middle clouds

1. Alto-stratus- These clouds consist of frozen water droplets and appear in a uniform manner. The colour of such clouds is bluish and grey.

2. Alto-cumulus- These are also called sheep clouds or wool pack clouds. They have a wave appearance in the sky and exist parallel.

3. Nimbo stratus- These clouds are associated with rain, sleet, and snow. These are dark, grey, featureless layers of clouds, thick enough to black out the sun.

•**<u>Low clouds</u>**- These clouds exist from the ground level up to 25 kilometers above. There are four types of clouds in this boundary:

1. Strato cumulus- These clouds are associated with clear or fair weather and are found at the height of 2500 to 3000 meters. These are grey or whitish in colour.

2. Stratus- These are low-lying dense clouds which are associated with rain or snow.

3. Cumulus- these clouds are also associated with fair weather and are domed shaped with a flat base and resembles a cauliflower.

4. Cumulo nimbus- These clouds are capable of producing heavy rains, hailstorms, tornadoes, and snow. These are thunderstorm clouds which fluffy and thick.

6 D. Question

Paragraph Questions:

How are cyclones formed? How are they classified?

Answer

Cyclones are centres of low pressure where winds from the surrounding high-pressure area converge towards the centre in a spiral form.

The process of formation of a cyclone is:

1) These are formed only over warm ocean waters near the equator. The warm air from the ocean rises up from near the surface thus leaving less air on the surface from where it has risen up. This causes the formation of a low-pressure area.

2) Air from surrounding areas with the high-pressure move towards the low-pressure area and this cool air becomes moist too and the cycle continues.

3) The warm air forms the clouds after rising up. The whole system of clouds and wind spins and grows fed by heat from the ocean and the water evaporating from the surface of the ocean.

4) The cycle continues and becomes faster and an eye forms in the centre. The high-pressure air from above flows down to the calmer eye downward.

Cyclones can be classified into:

1. Tropical cyclones –

These cyclones develop in the Intertropical convergence zone [ITCZ]. They are formed due to the differential heating of land and sea. These are characterized by low-pressure centre a closed low-level atmospheric circulation and a spiral arrangement of thunderstorms that produce heavy rain.

2. Temperate cyclones –

Temperate cyclones are formed along a front where hot and cold air masses meet in mid-latitudes between 35° and 65°N and S in both the hemispheres. These are low-pressure areas which drive the weather over much of the earth.

3. Extratropical Cyclones –

Extratropical cyclones occur in the latitudes between 30° and 60° in both the hemispheres. They are also called “mid-latitude cyclones". Such cyclones produce mild showers to heavy gales, thunderstorms, blizzards, etc.

6 E. Question

Paragraph Questions:

Explain the different forms of precipitation?

Answer

Precipitation refers to the downfall of water in either solid or liquid form on the surface of the earth.

The various forms of precipitation include:

1. Drizzle:

These are uniform minute droplets of water with a diameter of less than 0.5 mm.

2. Rain:

It is the most common and important form of precipitation. It occurs only when there is abundant moisture in the air. The diameter of a raindrop is more than 5mm.

3. Sleet:

It is precipitation in the form of pellets made up of transparent and translucent ice. It is a mixture of snow and ice.

4. Snow: It is formed when the temperature is below the freezing point. It is the precipitation of opaque and semi-opaque ice crystals.

5. Hails:

These are small hard balls of ice that fall from the sky.