Class 9th Geography

Chapter -1

Weather and Climate

TEXTUAL QUESTION AND ANSWERS

Q.1.What do you mean weather and climate? Distinguish between weather and climate.

Ans : The atmosphere condition that occurs in a place for a short period of time is called weather. On the other hand, the average atmosphere condition that prevails. Over a place for along period of time is known as climate.

The differences between Weather and climate are :

Sl.No.	Basis of different	Weather	Climate
i)	period	considered over a short period of time such as a day, a week, etc.	Considered over a long period of time (at least 30 years.)
ii)	Area	Indicates the atmosphere condition over a small area.	Refers to the atmospheric conditions

			over a large area.

Q.2. Mention the elements of weather and climate?

Ans : The main weather of elements of weather and climate are:

i) Temperature

ii) Pressure of air

iii) Humidity

iv) Wind

v) Precipitation

Q.3. State the main element of weather and climate.

Ans : The main element of weather and climate are temperature pressure of air, humidity, wind and precipitation.

a) Temperature :- The influence of temperature on weather and climate are :

i) The earth is heated by sun's light and heat. As the incident solar energy reaches the earth's surface, it gets reflected and this reflected heat warms up the lowest layer of the atmosphere_troposphere.as the air in this

layer gets heated up, it moves upward and cold air from the surrounding areas move in. In this way low pressure and high pressure centres are created.

ii) Temperature changes in the atmosphere along the vertical direction. As one moves up, temperature decrease at the rate of 6.5 c per kilometre in the troposphere.

(iii) Temperature also varies in the horizontal direction due to difference in the inclination of sun's rays. The temperature decreases as one moves from the equator towards the poles.

b) Pressure of air or atmosphere pressure :- The force exerted by air on per unit area effects weather and climate in the following ways:

i) Air of the lower layer of the atmosphere geats much compromise causing an increase in density. When density increases;atmosphere pressure also increases. As the density of air density as we go up, the atmosphere pressure decrease.

ii) Atmosphere pressure also changes horizontally. The density of air is low over the equator while it is high in the polar region. Hence, atmospheric pressure is very high in the polar regions while it is low in the equator.

c) Humidity :- Humidity, the amount of water vapour contained in the air influence weather and climate of a place. Temperature determines the water holding

capacity of air which contains varying amount of water vapour at various places at varied times. The warm air can hold more water vapour and cold air can hold comparative less amount of water vapour.

d) Wind :- The movement of air from high pressure area to low pressure area is called wind. Winds originate due to the variation in pressure and pressure is created by variation in temperature over place and time. Wind can reduce or increase temperature of a place and time. Wind can reduce or increase temperature of a place and thereby influence its climate condition.

v) Precipitation :- when the water vapour present in the air gets heated, it moves upward, get condensed and later come down to the earth in various from called precipitation. The various from of precipitation are dew, fog, mist, sleet, snowfall, rainfall, drizzle, etc. Amgo this snowfall and rainfall can considerably influence the weather and climate condition of a place.

Q. 4. Explain he relationship among temperature, pressure and humidity?

Ans : There is a close relationship among temperature, pressure and humidity.

i) The relationship between temperature and pressure is that when temperature increase atmosphere pressure decrease and vice versa.

ii) There exists a close relationship between humidity and temperature. Warm sir can hold more water vapour and cold air can hold less amount of water vapour. When the temperature is high, air became light and light air can hold more water vapour. In other words, when there is high temperature, humidity is also high and vice versa.

iii) The relationship between humidity and pressure is that humidity air has low pressure. In other word, as humidity increase, air pressure decrease and vice versa.

Q. 5.How are the variation in atmosphere pressure caused ?

Ans : Atmosphere pressure refers to the force created by air on per unit area. It varies on the basis of :

i) Air temperature :- Distribution of temperature is not uniform over the earth surface due to the difference in the inclined of sunrays. Due to temperature variation, some region of the earth are cold, some region are hot while some region are medium temperature. High temperature has low pressure while low temperature has high pressure. That is why the equatorial region which has high temperature experiences low pressure and polar regions which has low temperature, experience high pressure.

ii) Surface elevation or height :- The atmospheric pressure decrease with increase in surface elevation or

height. The atmospheric pressure decrease at the rate of 34mb millibar per 900 feet of high in the troposphere.

Q. 6.Why does wind blow ?

Ans : Different places have different pressure due to variation in temperature condition. In the regions having high temperature, the air gets heated and it goes up, creating in the process, a low pressure area. This forces the air from the surrounding high pressure area to move to the low pressure area. This brings about movement of air, I. e. blowing of wind.

Q.7.What is precipitation ? Name the different types of precipitation.

Ans : Condition of water vapour present in the air increases their size which later fall down to the earth' s surface due to force of gravity in various forms.
This is known as precipitation. The different types of precipitation are :

i) Dew.

ii) Fog

iii) Mist.

iv) Sleet.

v) Snowfall.

vi) Rainfall.

vii) Drizzle .

Q. 8. Mention the factors affecting weather and climate?

Ans : The main affecting weather and climate are :

i) Latitude.

ii) Elevation.

iii) Nearness to sea.

iv) Ocean currents.

v) Location of hills and mountains.

vi) Wind.

vii) Characteristics of land.

viii) Slope of the land.

ix) Vegetation.

Q. 9. Explain with examples the factory of weather and climate.

Ans : The main factory that influence weather and climate are:

i) Latitude :- the latitude of a place indicates how far it is from the equator. For instance, in the equator region, sun shine perpendicularly, so it is the hottest region of the earth. Temperature decrease gradually towards the poles as the sunrays falls Obliquely in the region. The oblique rays travel longer distance through the atmosphere having low intensity of heat which brings about low temperature in the polar region.

ii) Elevation :- Temperature varies with variation in height. Temperature decrease at the rate of 6.5 degree per kilometre increase in elevation. As a result, places situation on the same latitude may have different climatic conditions.

e. g. Shillong and Allahabad are situated on the same latitude, but experience different climate due to their difference in experience Shillong experience much colder climates than allahabad as the latter is situated at lower sea level than that of Shillong.

iii) Nearness to sea :- A place near to the sea has a mild Summer and mild winter, but a place far away from the sea has very hot summer and very cold winter. One of the main reasons for the mild climate of great Britain is it's nearness to the sea.

iv) ocean currents :- warm ocean currents flowing by the side of place along the sea coast increase temperature of the place while cold ocean currents flowing nearby reduce the temperature considerably.

e. g. the warm gulf Stream has made the North - West European coast less cold.

v) Location of hills and mountain:A high mountain Situated in a country may prevent very hot Or cold wind from entertaining the country.

E.g . The himalaya mountain prevent the cold winds of Central Asia from entering from Indian. Moreover the Himalayan range block the moisture-laden winds and bring rain to the windward side of mountain. The Ganga brahmaputra vallu lying at the foothills of the mountain, gets heavy rainfall during the monsoon.

vi) Wind :- The direction of wind as a great influence in bringing rain to a region. Wind also affects the temperature of region. The hot wind warms the land while cold wind cools the land.

e. g. in India, moisture-laden winds come from the bay of bangle and the Arabian sea during summer and it caused heavy rainfall in the Ganga Brahmaputra valley in the southern region.

Vii) Characteristics of the land :- An alluvial land with dense vegetation does not become too hot during summer or during the day. Such a land also does not become too cold during winter or at night. But Sandy soils devoid of vegetation get heated or cooled very quickly. The presence of dense vegetation also brings about good amount of rainfall.

e. g. the desert of Rajasthan become very hot during the day and get cooled at night.

viii) Slope of the land :- The sloping lands facing the sun receive vertical sunrays which lead to high temperature while the lands slapping against the sun receive less solar temperature.

e. g. The South facing slope of the Himalayan and alps experience more temperature than that of the North-facing slopes. The windward side of the mountain also receive more rainfall than other places.

ix) Vegetation :- the region that have dense forest get good rainfall. On the other hand, region with scantly vegetation gets less rainfall.

e. g. Many parts of Northeast India today face drought condition dur to extensive deforestation that has taken place in this region.

Q.10. What are the types of climate?

Ans : The various types of climate are :

i) Equatorial climate.

ii) Monsoon climate.

iii) Savanna or sudan type climate.

iv) Hot desert climate.

v) Temperature desert climate.

vi) Mediterranean climate.

vii) Temperature humid or Chinese climate.

viii) Temperature grassland climate

ix) Temperature maritime climate.

x) Humid east-coast climate.

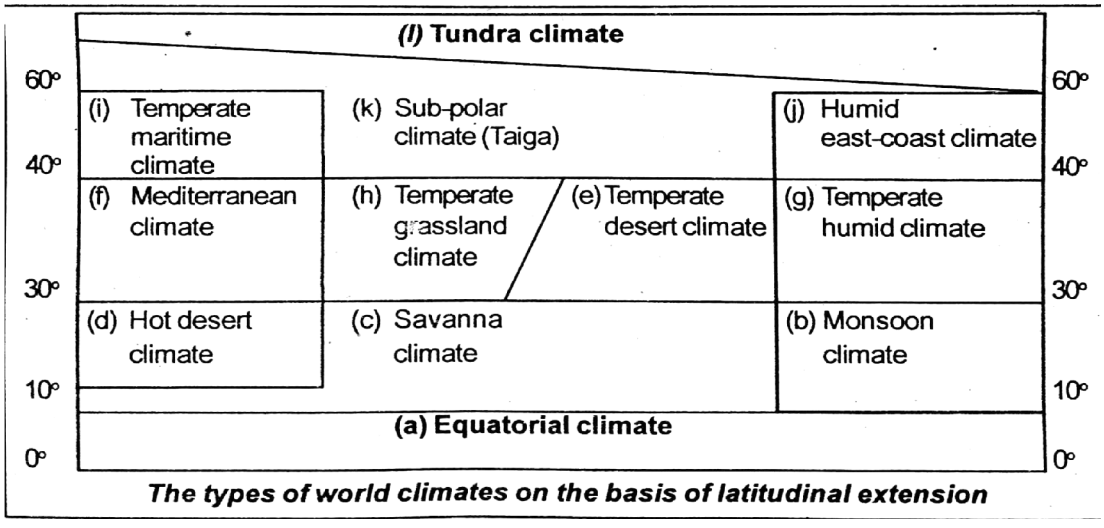
xi) Sub-polar taiga climate.

xii) Tundra climate.

xiii) Mountain climate.

Q.11.State the various types of climate with suitable diagrams.

Ans : The various types of climate on the basis of latitudinal extension in shown below.



The types of world climates on the basis of latitudinal extension

Q.12.Write short notes on the following :

a) Relative humidity.

b) Atmosphere pressure.

c) Pressure belts.

d) Types of rainfall.

e) Effect of latitudes on climate.

f) Effect of vegetation on climate.

g) Monsoon climate.

h) Taiga type of climate.

i) Meditation climate.

J) Savanna climate.

K) Tundra climate.

I) Mountain climate

Ans : a) Relative humidity :- Relative humidity is the ratio of the weight of water vapour present in a definite volume of air at definite temperature and the weight of water vapour necessary for saturation of the same volume of air at the same temperature. Generally it is express in percentage.

Relative humidity - the weight of water vapour present in a definite volume of air at definite temperature. The weight of water vapour necessary for saturation of the same volume of the air at the same temperature. ×100% With the change of air temperature, the capacity to retain moisture increase and those also effective relative humidity. It is greater on the ocean and least over the continued. It is also very little over the desert area.

b) Atmosphere pressure :- Atmosphere pressure means the force exerted by air on per unit area. The average atmospheric pressure at sea level at 15°C is 1013.2 mb millibar. It is measure with the help of an instrument named barometer.

c) pressure belts :- Due to variation in temperature, different places have different atmosphere pressure. On the basis of pressure variation on the surface of the earth, the following permanent pressure belts have been indefinite in the northern and southern Hemisphere.

i) Equatorial low pressure hemisphere.

ii) Sub tropical high pressure belt.

iii) Sin proper low pressure belt.

iv) Polar high pressure belt.

d) Types of rainfall :- rainfall is one of the main forms of precipitation. It has a great influence on the climate. Rainfall is of five types :

i) Conventional rainfall :- the air over the earth surface gets heated due to intense solar radiation and this heated air moves upward in the atmosphere. The water vapour contains in such air gets condensed and falls down as rain called conventional rainfall.

ii) Orographic rainfall :- something rain occurs due to the blocking of the moisture-laden winds by the hills and mountain forcing them to go up, get condensed and fall down as rain know as orographic rainfall or relief rain.

iii) Cyclonic rainfall :- the rainfall which occur along with the cyclonic wind is known as cyclonic rainfall.

iv) Latitudinal rainfall :- The which occur in some region due to there latitudinal position is known as latitudinal rainfall. Generally such rains are caused by planetary or permanent winds blowing over certain latitude.

v) Forest rainfall :- the air around forest has more moisture due to the respiration of the plant when such air goes up it gets condensed and falls down as rain called forest rain.

e) Effect of latitude on climate :

Ans : same as 9 no ans.

f) Effect of vegetation on climate?

Ans : same as 9 no ans.

g) Monsoon climate :- The monsoon climate is experience in the eastern parts of the countries in the northern hemisphere lying between 10°N and 40°N latitude. This region experience summer temperature between 27° C and 32°C . The average annual rainfall is between 100 and 200 cm. The region that receive annual rainfall between 100 and 200cm have deciduous types of forest while region that get more than 200cm of rainfall have evergreen forest.

h) Taiga types of climate :- The subpolar climate is experience in the subpolar region lying between 50° and 65°N and S lines of latitude. The average summer temperature ranges from 10°C to 30°C while average winter temperature goes down to 2.5°C .

i) Mediterranean climate :- the latitudinal location of Mediterranean climate region is 30° and 45° north and South of the equator. The summer temperature of this region various from 21°C to 27°C while winter temperature range from 10°C to 13°C.This region experience rainfall in winter. The main areas having this type of climate include region around the Mediterranean Sea, Chilean coast, southern coast of Africa, South West Coast of Australia, California in us, etc.

J.Savanna climate:the savanna type of climate is also known as sudan type climate. This climate prevails in region such as Sudan, Central Indian, North Central Africa, southern Brazil, Argentina, Venezuela and central parts of central Australia. The average summer temperature is 27 C- and average winter temperature

various from 10°C to 15°C.The rainfall various from 25cm to 40 CM.

k) Tundra climate :- The region lying within the Arctic and Antarctic circle experience Tundra climate which private in the northern most part of Asia, Canada and Australia. The region under the climate receive sunshine of low intensity for almost six months and remaining six months are night. Summer temperature hardly goes up to 10° C while winter temperature drops down below 0°C . As the surface remains covers with ice for nine months of the year, so only lichens and some mosses grow. The population is sparse with some Eskimo and only a few other hunter groups live in such extreme cold climate.

I) Mountain climate :- Due to high elevation, mountain have different climate conditions depending on the height. Equatorial types of climate prevails along the foothills region and with the increase of height climate change. Alpine climate exists in the middle portion. Here the air remains cold and moderated rainfall take place. Vegetation such as Grasses, shrubs, coniferous tree are found here. The Alpine climate is suitable for sheep and cattle rearing. At high attitude tundra of climate prevails. This type of climate is found in the high range of mountain such as the himalayas, Alps, Rockies, Andes and etc.

Q.13. Answer the following question:

a) How far does the atmosphere extend above from the earth surface?

Ans : The atmosphere extend up to the height of nearly 10,000 km from the earth surface.

b) What is lapse rate?

Ans : Lapse rate is the rate of decrease of temperature in the Troposphere on the basis of increase in attitude. This lapse rate is 6.5°C per kmna with increase in evaluation along the atmosphere from the earth surface.

c) What is the average atmosphere pressure on the sea level?

Ans : The average atmosphere pressure on the sea level at 15°C is 1013.2mb (millibar) .

d) What is humidity of air?

Ans : Humidity of air is the amount of water vapour contained in the air.

e) What You mean by term ‘saturated air’ ?

Ans : It is a particular volume of air with particular temperature has exactly that amount of water vapour which it can hold a particular temperature condition, than such a parcel of air is known as saturated air.

f) What is the latitudinal extension of the equatorial climate?

Ans : The equatorial climate prevails in the region bounded between the equator and 10°N and S lines of latitude.

g) In which climate is the compos grassland found?

Ans : The grassland compos is found in the savanna climate that exist in the grassland of Brazil.

h) Mentioned the latitudinal extension of the temperature desert climate region?

Ans : The temperature desert climate region lies between 30°and 40°N and S of the equator.

i) What is the other name of Chinese climate?

Ans : The other name of Chinese climate is temperate humid climate.

j) Give the example of irregular wind?

Ans : Cyclone is an example of irregular wind.

k) Why does the warm airmass have the capacity to hold more water vapour ?

Ans : Temperature cause air to expand and thus density of air decrease. When air density decreases, air

becomes light and light air is able to hold more water vapour. Such air goes up and is able to collect the moisture present in the atmosphere. In this way, the warm air mass have the capacity to hold more water vapour.

I) Why there is more atmosphere pressure at the lower level of the atmosphere?

Ans : Air is comprehensive and hence the air at the lower layer of the atmosphere gets much comprehensive resulting in the increase in its density. When density of air increase, its pressure also increase. Therefore, there is more atmosphere pressure in the lower layer of the atmosphere.

Q.14. Draw a diagram of the barometer of your school and label its different parts. Collect the barometer reading on the atmosphere pressure for a week with the help of your teacher and draw a graph from the data so collected.

Ans : Students should do it themselves with the help of teacher.

Q.15. Record the weather reports and data from the radio or television for a week and compare these data with the next week's data to find the change in weather condition?

Ans : Student should do it themselves.