

CHAPTER 3

STUDY OF WEATHER

Q1. Fill in the blanks:

1. Condition of the atmosphere over a very small area is called Weather.
2. The process of heat transfer in a gas or liquid is called Convection.
3. Equatorial and Tropical Regions are warmer than regions near the poles.
4. Places away from sea experience continental climate.
5. Eastern Coast of Japan gets heated up by the warm Kuroshio Current.
6. Atmospheric pressure at sea level is 1013 mb.

Q2. Complete the following:

1. High temperature: *Low Pressure*; Low temperature: *High Pressure*
2. Cold air: *High Pressure*; Warm air: *Low Pressure*
3. Equatorial Low Pressure Belt: *Doldrums*; Sub-Tropical High Pressure Belt: *Horse Latitudes*
4. Horizontal movement of air: *Winds*; Vertical Movement of Air: *Air Current*
5. Weather: *Meteorology*; Climate: *Climatology*
6. Central Europe: *Mistral*; Rocky Mountains: *Chinook*

Q3. State weather the given statement is true or false:

1. Fall in the temperatures results in high humidity in a given area. – *True*
2. Atmosphere is heated due to conduction and convection – *True*
3. Sub-tropical High Pressure Belt is characterised by cyclonic storms in winters – *False*
4. The Pressure belts shift 10° to 15° North and South from the normal position, due to the apparent movement of the sun - *False*
5. The winds move from low pressure to high pressure – *False*
6. Land heats and cools faster than water – *True*

7. The presence of clouds during the day increases the insolation reaching the earth's surface - **False**

Q4. Define

1. **Lapse Rate**: Decrease in temperature by 1°C for every 165 meters of ascent.
2. **Radiation**: The process of energy transmission from one body to another without any medium.
3. **Temperature**: Degree of hotness or coolness of the air.
4. **Ocean Currents**: Ocean currents are the continuous, predictable, directional movement of seawater driven by gravity, wind (Coriolis Effect), and water density.
5. **Conduction**: The transfer of heat through matters by transmission of energy from particles to particles without displacement.

Q5. Distinguish:

1. Weather and Climate (**Ans. Pg. 40 table of Weather and Climate**)
2. Winds and Air Current

Winds	Air Current
The horizontal movement of air is called wind	The vertical movement of air is called air currents.

3. Equatorial Low Pressure Belt and Sub Polar Low Pressure Belt

Equatorial Low Pressure Belt	Sub Polar Low Pressure Belt
It extends 5°N and 5°S latitudes	It extends 60°N and 60°S latitudes
Here the temperatures are high throughout the year that heats up the air, which becomes light and rises up to the tropics, creating low pressure.	Here the air coming from sub-tropical and polar high pressure belt converge and ascend, creating low pressure.
There are no surface winds and calm conditions prevail	This belt is characterised by cyclonic storms in winters

4. Warm Ocean Current and Cold Ocean Current

Ans:

Warm Ocean Current	Cold Ocean Current
Those currents that flow from the Equator towards the poles are warmer than the surrounding water and so they are called warm currents.	The ocean currents that flow from the polar areas towards the Equator are cooler compared to the surrounding water, so they are called cold currents.
In the Northern Hemisphere the warm currents are found on the west coasts of the continents in the high latitudes.	The cold currents are usually found on the east coast in the middle latitudes in the Northern Hemisphere.
Eg: North Atlantic Drift, Kuroshio Current	Eg: Oyashio Current, Labrador Current

Q6. Answer the following questions:

1. What are the elements of weather/factors that affect climate?

Ans: Latitude, Altitude, Distance from the Sea, Winds, Slope of the land, Ocean Currents, Cloud Cover, Atmospheric Pressure, Humidity, Precipitation, Sunshine are the elements of the weather/factors that affect climate.

2. Why do pressure belts shift North and South of its normal position?

Ans: The pressure belts are not static. As the apparent movement of the sun is northwards towards Tropic of Cancer during March to June and southwards towards Tropic of Capricorn during September to December the pressure exerted also shifts 5° to 10° north and south of its normal position.

3. Why do regions near North and South Pole create high pressure belts?

Ans: The regions near North and South Pole receive very little insolation and remain cold throughout the year due to which the air is always cold, dense and thus subsides/descends, creating a high pressure.

4. Why does moist air ascend?

Ans: Presence of water vapour in the air expands the volume and decreases the density, exerting less pressure than dry air. Thus, moist air always ascends.

5. What is Atmospheric Pressure?

Ans: It is the force exerted by a column of air due to its weight over a unit area of 1 square centimetre on the earth surface.

6. Why is North-western Europe warm as compared to Labrador coast even though both lie on the same latitudes?

Ans: The winds that blow from sea to land and pass over a warm water current, tends to increase the temperature in the coastal area, whereas the winds that pass over cold water currents, tends to decrease the temperature and create dry conditions.

Labrador cold current flows southwards along the Labrador coast making it cold and ice bound for almost nine months whereas North Western Europe lying on the same latitude receive winds pass over the warm North Atlantic Drift keeping it comparatively warm.

7. What type of climate does Delhi experience? Why?

Ans: Delhi experience continental type of climate as it is located away from the coast and does not experience the moderating effect of land and sea breeze and experience by coastal areas.

8. Why in Northern Hemisphere, the southern slopes of Himalayas have more human settlements than north facing slopes?

Ans: The mountain slopes which face the sun, receive more insolation as direct sunrays fall on them. In Northern Hemisphere, the southern slopes face the sun and are thus warmer than the north facing slopes.

9. Why does warm air create low pressure and cold air create high pressure?

Ans: When temperature increases, the volume of the air expands and the density decreases which makes the air become lighter and ascend, creating low pressure.

On the other hand, when the temperature decreases air gets cooled, its volume contracts and becomes denser and as the molecules in it are closely spaced, the air becomes heavy and descends, creating high pressure.

10. How does density of air and pressure exerted decrease with altitude?

Ans: In higher altitudes, the air is thin and there is insufficient oxygen in the air whereas at lower altitudes i.e. areas above sea level air pressure is highest due to compression of the lower layers of the atmosphere. Thus, density of air and pressure exerted decrease with altitude.

Questions to be written in the notebook

Q4. 2,4,5

Q5. 3,4

Q6. 2,3,6,9,