Chapter 4: Climate

Exercises — Exercises

Q1 What causes rainfall on the coastal areas of Tamil Nadu in the beginning of winters?
(a) South-West monsoon
(b) Temperate cyclones
(c) North-Eastern monsoon
(d) Local air circulation

(c) North-Eastern monsoon. In October and November the northeast monsoon crosses the Bay of Bengal, picks up moisture and brings torrential rain to the Tamil Nadu coast. The south-west monsoon leaves this coast dry, and temperate cyclones affect the northwest.

Q2 What is the proportion of area of India which receives annual rainfall less than 75 cm?
(a) Half
(b) One-third
(c) Two-third
(d) Three-fourth

(b) One-third. The all-India average is about 125 cm, but rainfall is very uneven. Large dry stretches such as western Rajasthan, Ladakh and parts of the Peninsula (Andhra Pradesh, Karnataka, Maharashtra) get under 50 cm, and the Deccan Plateau and the north-west get 50-100 cm, so roughly one-third of the country gets under 75 cm.

Q3 Which one of the following is not a fact regarding South India?
(a) Diurnal range of temperature is less here.
(b) Annual range of temperature is less here.
(c) Temperatures here are high throughout the year.
(d) Extreme climatic conditions are found here.

(d) Extreme climatic conditions are found here. South of the Tropic of Cancer the tropical zone is near the equator, so temperatures stay high all year with small daily and annual ranges. The sea's moderating influence keeps conditions equable. Extremes belong to the interior north.

Q4 Which one of the following phenomenon happens when the sun shines vertically over the Tropic of Capricorn in the southern hemisphere?
(a) High pressure develops over North-western India due to low temperatures.
(b) Low pressure develops over North-western India due to high temperatures.
(c) No changes in temperature and pressure occur in north-western India.
(d) 'Loo' blows in the North-western India.

(a) High pressure develops over North-western India due to low temperatures. Around 22 December the sun is overhead at the Tropic of Capricorn, and the northern plain has feeble high pressure. Winds then blow outwards from it to the lower pressure over the Indian Ocean in the south. Low pressure and the Loo belong to summer.

Q5 What is the Inter-Tropical Convergence Zone?

The Inter-Tropical Convergence Zone (ITCZ) is a low pressure zone over the equator where trade winds from both hemispheres converge, so air tends to rise. In July it shifts to about 20-25 degrees N over the Gangetic plain (the monsoon trough), drawing in the southwest monsoon. In winter it moves south.

Q6 What is meant by 'bursting of monsoon'? Name the place of India which gets the highest rainfall.

The sudden onset of the moisture-laden southwest monsoon winds, with violent thunder and lightning, brings abrupt heavy rain and sharply lowers temperature. This is called the 'break' or 'burst' of the monsoon. Mawsynram, on the crest of the Khasi Hills in Meghalaya, receives the highest average annual rainfall in the world.

Q7 Which type(s) of cyclones cause rainfall in north-western India during winter? Where do they originate?

Weak temperate (western) cyclones, called shallow cyclonic depressions, cause winter rain in north-western India. They originate over the eastern Mediterranean Sea and travel eastwards across West Asia, Iran, Afghanistan and Pakistan, gaining moisture from the Caspian Sea and Persian Gulf. They bring small but useful rain to Punjab, Haryana, Delhi and western Uttar Pradesh, which helps rabi crops.

Q8 Notwithstanding the broad climatic unity, the climate of India has many regional variations. Elaborate this statement giving suitable examples.

India has a monsoon climate that unites it with south and southeast Asia, yet regions differ in temperature, winds, rainfall, the rhythm of seasons and wetness or dryness. These differences are sub-types of the monsoon climate.

Temperature: western Rajasthan may touch 55 degrees C in summer, while Leh drops to about minus 45 degrees C in winter. Churu can record 50 degrees C or more in June, while Tawang barely reaches 19 degrees C. On a December night Drass falls to minus 45 degrees C, while Thiruvananthapuram or Chennai records 20-22 degrees C. Day-night differences are only seven or eight degrees in Kerala and the Andamans, but in the Thar desert a 50 degree C day may fall to 15-20 degrees C at night.

Precipitation: the Himalayas get snow, while the rest of India gets only rain. Cherrapunji and Mawsynram receive over 1,080 cm a year, while Jaisalmer rarely gets more than 9 cm. The Ganga delta and Odisha coast get storms every third to fifth day in July-August, while the Coromandel coast stays dry. Most areas get rain in June-September, but coastal Tamil Nadu gets it in early winter.

Q9 How many distinct seasons are found in India as per the Indian Meteorological Department? Discuss the weather conditions associated with any one season in detail.

The meteorologists recognise four seasons: the cold weather season, the hot weather season, the southwest monsoon season and the retreating monsoon season.

Cold weather season (mid-November to February): Temperature: it sets in by mid-November in the north, and December-January are coldest, with mean daily temperature below 21 degrees C and nights sometimes below freezing in Punjab and Rajasthan. The causes are distance from the sea (continental climate), Himalayan snowfall and cold winds from the Caspian Sea and Turkmenistan around February. The Peninsula has no well-defined cold season, since the sea moderates it; Thiruvananthapuram's January mean maximum is 21 degrees C.

Pressure and winds: the sun is vertically over the Tropic of Capricorn, so weak high pressure lies over the northern plain. Light winds of 3-5 km an hour blow outwards towards the ocean, westerly or northwesterly down the Ganga valley and northeasterly over the Bay of Bengal.

Rainfall: winter monsoons give no rain because they come from land and have little humidity. Western disturbances give small rain to the north-west, northeast monsoon rain to Tamil Nadu in October-November.