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1 Why the houses in Rajasthan have thick walls and flat roofs?

Ans. In Rajasthan, the weather is very hot and there is less rainfall. Some part of the state is covered with desert. The thick walls of the houses insulate the people against the heat in summer and extreme cold in winter due to the desert. Flat roofs are easier to construct and as there is not much rainfall, water will collect on the rooftops.

2 Why is it that the houses in the Tarai region and in Goa and Mangalore have sloping roofs?

Ans. The houses in the Tarai region and in Goa and Mangalore have sloping roofs because they get heavy rain during the monsoon. When there are sloping roofs, the rain water can easily flow off towards the ground or to a receptive unit where water is collected instead of collecting on the rooftop.

3 Why houses in Assam built on stilts?

Ans. Houses in Assam are built on stilts because the state receives abundant rainfall due to which there are chances of floods. In case of flood, the water might get inside the houses if the houses are built on ground level, so in order to avoid flooding of houses, houses are built on stilts and above the ground level.

4 Why most of the world's deserts are located in the Western margins of continents in the subtropics?

Ans. Most of the world's deserts are located in the Western margins of continents in the subtropics because the prevailing winds in the tropics are tropical easterly winds. These winds become dry by the time they reach the Western margins of the continents and so they bring no rainfall. Thus, the region becomes devoid of moisture which causes dry conditions leading to formation of deserts.

Exercises

1 Choose the correct answer from the four alternatives given below

(*i*) Which one of the following places receives the highest rainfall in the world?
(*a*) Silchar (*b*) Mawsynram
(*c*) Cherrapunji (*d*) Guwahati

(*ii*) The wind blowing in the Northern plains in summers is known as
(*a*) Kaal Baisakhi (*b*) Loo
(*c*) Trade Winds (*d*) None of these

(*iii*) Which one of the following causes rainfall during winters in North-Western part of Ind
(*a*) Cyclonic depression
(*b*) Retreating monsoon
(*c*) Western disturbances
(*d*) South-West monsoon

(*iv*) Monsoon arrives in India approximately in
(*a*) early May (*b*) early July
(*c*) early June (*d*) early August

(*v*) Which one of the following characterises t cold weather season in India?
(*a*) Warm days and warm nights
(*b*) Warm days and cold nights
(*c*) Cool days and cold nights
(*d*) Cool days and warm nights

Ans. (*i*) (*b*), (*ii*) (*b*), (*iii*) (*c*), (*iv*) (*c*), (*v*) (*b*)

2 Answer the following questions briefly.

(*i*) What are the controls affecting the climate of

Ans. The controls affecting the climate of India a latitude, altitude, pressure and wind system, distance from the sea, ocean currents and rel features.

(*ii*) Why does India have a monsoon type of cli

Ans. The occurrence of seasonal reversal of wind makes Indian climate monsoon type. In sum the winds blow from sea to land and in wint reverse occurs i.e. winds blow from land to s

(*iii*) Which part of India experiences the highe diurnal range of temperature and why?

Ans. The North-Western part of India comprisin Indian desert experiences the highest diurnal of temperature. This is because of the fact th sand (found in ample quantity in this region and loses heat very quickly.

As a result of this phenomenon, there is a wi difference between day and night temperatur The day temperature may rise to 50°C and d down to near 15°C the same night.

(*iv*) Which winds account for rainfall along the Malabar coast?

Ans. The South-West monsoon winds are respons for rainfall along the Malabar coast.

(v) What are jet streams and how do they affect the climate of India?

Ans. Jet streams are a narrow belt of fast moving high-altitude winds. *The jet streams affect Indian climate in following manner*

Sub-tropical westerly jet stream Over India, these jet streams blow South of Himalayas all through the year (except in summer). During winters, the Western cyclonic disturbances are brought into India by these jet stream.

Tropical-easterly jet stream It blows over peninsular India (at about 14°N latitude). It is believed to be responsible for the sudden outbreak of the South-West monsoon in India.

(vi) Define monsoon. What do you understand by 'break' in monsoon?

Ans. Monsoon refers to the complete reversal of winds over a large area leading to a change of seasons. Monsoons have wet and dry spells. The monsoon rains take place for a few days at a time. They are interspersed with rainless intervals. Such rainless intervals are called 'break' in monsoon.

(vii) Why is the monsoon considered as a unifying bond?

Ans. The presence of Himalayan range in North and ocean in the South have created a unique climatic condition over Indian sub-continent.

The seasonal alternation of wind system (i.e. monsoon) and the associated weather conditions provide a rhythmic cycle of seasons. Indian landscape, life style, agriculture, food habit, culture etc all revolve around these phenomena. By providing water to the agriculture and regulating the flow of water in river valleys (connecting different states), monsoon binds the whole country together. Thus, monsoon is a unifying bond.

3 Why does the rainfall decrease from the East to the West in Northern India?

Ans. There is a gradual decrease of rainfall from the East to the West in North India. The progressive decline of humidity of the winds is responsible for this. As the moisture bearing winds of the Bay of Bengal branch of the South-West monsoon move further and further inland, their moisture content decreases. As a result, there is a gradual decrease of rainfall from East to West direction.

4 Give reasons as to why

(i) Seasonal reversal of wind direction takes place over the Indian sub-continent.

(ii) The bulk of rainfall in India is concentrated over a few months.

(iii) The Tamil Nadu coast receives winter rainfall.

(iv) The delta region of the Eastern coast is frequently struck by cyclones.

(v) Parts of Rajasthan, Gujarat and the leeward side of the Western Ghats are drought-prone.

Ans. (i) *Seasonal reversal of wind direction can be understood by the following points*

(a) During summer, a low pressure region develops over interior Asia and North Western India, which attracts monsoon winds.

(b) With the reversal in the direction of the surface winds, the monsoons withdraw from the Northern plains. This reversal occurs as the monsoon trough becomes weaker with the approach of winter months.

(c) Whereas, during winters, a high pressure area develops North of Himalayas. And cold dry winds blow from this high pressure region to the low pressure areas that develops over the oceans to the South.

(d) Thus, these differences in pressure conditions are responsible for a complete reversal of the direction of winds.

(ii) The rainfall received by India is largely due to the South-West monsoon winds, which is characterised by seasonal reversal of wind. The most of the rain comes from South-West monsoon. The duration of the monsoon is between 100 to 120 days. Hence, the bulk of rainfall received by the country is concentrated over a few months.

(iii) During the winter season, North-East trade winds prevail over India. They blow from land to sea and hence, for most part of the country, it is a dry season. However, the Tamil Nadu coast receives winter rainfall due to these winds. This is because in this region these winds blow from sea (Bay of Bengal) to land, thereby carrying moisture alongwith them.

(iv) The delta region of the Eastern coast of India is frequently struck by cyclones. This is because the cyclonic depressions that originate over the Andaman sea are brought in by the sub-tropical easterly jet stream blowing over peninsular India during the monsoon as well as during the October to November period. The depression moves along East to West direction thus hitting the Eastern coasts.

(v) Parts of Rajasthan, Gujarat and the leeward side of the Western Ghats are drought-prone because of the scanty rainfall received by these regions during the monsoon rains.

The progressive decrease in the humidity of the winds of the Bay of Bengal branch causes the amount of rainfall to decrease from East to West in Northern India.

As the leeward side is the rain-shadow area, the regions lying in this region receive very little rain from the Arabian sea branch. It is the windward side of the Western Ghats that receives the maximum rain.

Note: *This type of question will not be asked in the examination. Only two or three sub-parts will be asked.*

5 Describe the regional variations in the climatic conditions of India with the help of suitable examples.

Ans. The regional variation of the climatic conditions of India is mainly due to two factors, *viz*, temperature and precipitation (or rainfall). These two elements vary from place to place and season to season.

Temperature

During summer on the one hand, the temperature of desert area (e.g. parts of Rajasthan) crosses 50°C mark; on the other, hilly region (e.g. Pahalgam) has around 20°C temperature.

Similarly, the temperature of winter night at Drass (Jammu and Kashmir) is – 45°C where as in coastal area (e.g. Thiruvananthapuram), it is about 22°C. The coastal region (e.g. Kerala) and island (e.g. Andaman and Nicobar) have uniform temperature throughout the year.

Precipitation

In India, there is variation in type, amount and seasonal distribution of rainfall from region to region. For example the precipitation is in the form of snowfall in the Himalayas, whereas it is in the form of rainfall in the rest of the country.

In the same season, Western Ghats and North-East part of the country receive more than 200 cm rainfall (Meghalaya-400 cm), it is less than 10 cm in Ladakh and Western Rajasthan. Most part of the country receives rainfall from June to September whereas the Tamil Nadu coast receives rainfall during October and November. There is gradual decrease of rainfall generally from East to West.

6 Discuss the mechanism of monsoons.

Ans. The monsoons are experienced in the tropical regions roughly between 20°N to 20°S. There are various phenomena to explain the mechanism of monsoon in India.

(*i*) **Differential heating and cooling of land and water** At the end of May, due to high temperature, low- pressure area is found on the landmass and sea/ocean experience comparatively higher temperature.

(*ii*) **Shift in the position of Inter Tropical Convergence Zone (ITCZ)** In summer, ITCZ or the low pressure trough is shifted its position over the Ganga plain. It is known as 'monsoon trough' during monsoon season.

(*iii*) **Presence of high pressure area at 20°S over the Indian ocean (East of Madagascar)** The intensity and position of this high pressure area affects the Indian monsoon.

(*iv*) **Intensely heating of Tibetan plateau** In summer, intense heating of Tibetan plateau results in strong vertical air currents and formation of high pressure over the plateau at about 9 km above sea level.

(*v*) **Westerly jet stream and tropical easterly jet stream** The movement of westerly jet streams to the North of the Himalayas and the presence of the tropical easterly jet streams over the Indian peninsula during summer. This periodic change in pressure conditions is known as Southern Oscillation (SO).

This change in the pressure conditions over the Southern ocean also affects the monsoon.

7 Give an account of weather conditions and characteristics of the cold season.

Ans. The cold weather season begins from November in Northern India and stays till February. December and January are the coldest months in the Northern part of India. *The characteristics of cold season are as follows*

(*i*) The weather is normally marked by clear sky, temperatures, low humidity and feeble, variable winds.

(*ii*) Days are warm and nights are cold. Frost is common in the North and higher slopes of the Himalayas experience snowfall.

(*iii*) During this season, the North-East trade winds blow from land to sea and hence, for most parts of the country, it is a dry season. Some amount of rainfall occurs on the Tamil Nadu coast from these winds as they blow there from sea to land.

(*iv*) A characteristic feature of the cold weather season in the Northern plains is the inflow of cyclonic disturbances from the West and the North-West.

(*v*) They cause the much needed winter rains over the plains and snowfall in the mountain.

(*vi*) The peninsular region does not have a well defined cold season. There is hardly any noticeable change in temperature pattern during winter due to the moderating influence of the sea.

8 Give the characteristics and effects of the monsoon rainfall in India.

Ans. **Characteristics of Monsoon Rainfall**

(*i*) Monsoon winds are non-steady and pulsating in nature.

(*ii*) Its duration varies from 100-120 days (early June-mid September).

(*iii*) Around the time of its arrival, there is sudden increase and continuous rainfall for several days, called as 'Burst of monsoon'.