1. INDIA-SIZE AND LOCATION

Question 1:

Choose the right answer from the four alternatives given below.

(i) The Tropic of Cancer does **not** pass through

(a) Rajasthan	(c) Chhattisgarh
(b) Orissa	(d) Tripura

(ii) The easternmost longitude of India is

(a) 97° 25' E	(c) 77° 6' E
(b) 68° 7' E	(d) 82° 32' E

(iii) Uttarakhand, Uttar Pradesh, Bihar, West Bengal and Sikkim have common frontiers with

(a) China	(c) Nepal
(b) Bhutan	(d) Myanmar

(iv) If you intend to visit Kavaratti during your summer vacations, which one of the following Union Territories of India you will be going to?

(a) Puducherry	(c) Andaman and Nicobar
(b) Lakshadweep	(d) Diu and Daman

(v) My friend hails from a country which does **not** share land boundary with India. Identify the country.

(a) Bhutan	(c) Bangladesh
(b) Tajikistan	(d) Nepal

- **Answer**

(i) The Tropic of Cancer does **not** pass through

(a) Rajasthan	**(c)** Chhattisgarh

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(a) Bhutan	**(c)** Bangladesh
(b) Tajikistan ✓	**(d)** Nepal

Question 2:

Answer the following questions briefly.

(i) Name the group of islands lying in the Arabian Sea.

Ans: Lakshadweep Islands lie in the Arabian Sea.

(ii) Name the countries which are larger than India.

Ans: Russia, Canada, USA, China, Brazil and Australia are the countries that are larger than India.

(iii) Which island group of India lies to its south-east?

Ans: Andaman and Nicobar Islands lie to the south-east of India.

(iv) Which island countries are our southern neighbours?

Ans: Sri Lanka and Maldives are the two island countries that are the southern neighbours of India.

Question 3:

The central location of India at the head of the Indian Ocean is considered of great significance. Why?

- **Answer**

The Indian landmass is centrally located between east and west Asia. The part that is attached to the Asian continent connects India (through land routes and mountain passes) to the various countries lying to its north, west and east. The part that protrudes into the Indian Ocean connects India (through the trans Indian Ocean routes) to Europe, west Asia and Africa in the west and the countries of east Asia. The strategic location of India has contributed to the exchange of ideas and commodities, through land and sea, since ancient times. This is the reason why its location at the head of the Indian Ocean is significant.

2. PHYSICAL FEATURES OF INDIA

Question 1:

Choose the right answer from the four alternatives given below.

(i) A landmass bound by sea on three sides is referred to as

(a) Coast	(c) Peninsula
(b) Island	(d) None of the above

(ii) Mountain ranges in the eastern part of India forming its boundary with Myanmar are collectively called as

(a) Himachal	(c) Purvachal
(b) Uttarakhand	(d) None of the above

(iii) The western coastal strip, south of Goa is referred to as

(a) Coromandel	(c) Kannad
(b) Konkan	(d) Northern Circar

(iv) The highest peak in the Eastern Ghats is

(a) Anai Mudi	(c) Mahendragiri
(b) Kanchenjunga	(d) Khasi

- **Answer**

(i) A landmass bound by sea on three sides is referred to as

(a) Coast	**(c)** Peninsula ✓
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(a) Anai Mudi	**(c)** Mahendragiri ✓
(b) Kanchenjunga	**(d)** Khasi

Question 2:

Answer the following questions briefly.

(i) What are tectonic plates?

(ii) Which continents of today were part of the Gondwana land?

(iii) What is the *bhabar*?

(iv) Name the three major divisions of the Himalayas from north to south.

(v) Which plateau lies between the Aravali and the Vindhyan ranges?

(vi) Name the island group of India having coral origin.

- **Answer**

(i) The convectional currents present below the solid layer of Earth's crust split the crust or the lithosphere into a number of large fragments. These fragments are called tectonic or lithospheric plates.

(ii) The continents that were part of Gondwana land are Australia, Antarctica and South America.

(iii) The *bhabhar* is that part of the Northern Plains where the rivers, after descending from the mountains, deposit pebbles. It is a narrow belt, having a width of about 8 to 16 km and lying parallel to the slopes of the Shiwaliks.

(iv) The three major divisions of the Himalayas from north to south are the Great Himalayas/Inner Himalayas/**Himadri** (Northernmost division), the Lesser Himalayas/**Himachal** and the **Shiwaliks** (Southernmost division).

(v) Malwa plateau lies between the Aravali and the Vindhyan ranges.

(vi) Lakshadweep Islands are composed of small coral islands.

Question 3:

Distinguish between

(i) Converging and diverging tectonic plates

(ii) *Bhangar* and *Khadar*

(iii) Western Ghats and Eastern Ghats

- **Answer**

(i) The Earth's crust is broken up into several lithospheric or tectonic plates. These plates are constantly moving atop the Earth's mantle (semi-solid layer of molten rocks). Based upon their motion, tectonic plates are referred to as converging or diverging. **Converging tectonic plates** move towards each other and form convergent boundary. **Diverging tectonic plates** move away from each other and form divergent boundary.

(ii)*Bhangar* is the terrace-like feature present above the flood plains of the rivers. It is composed of older alluvium. It is the largest part of the Northern Plain. The soil of this region contains calcerous deposits locally known as *kankar*.

The newer, younger deposits of the flood plains are called ***khadar***. This region is very fertile as it gets renewed almost every year. Hence, it is ideal for intensive agriculture.

(iii)

Western Ghats	**Eastern Ghats**
Mark the western edge of the Deccan Plateau	Mark the eastern edge of the Deccan Plateau
Continuous	Discontinuous and irregular
Higher; average elevation is 900−1600 metres	Lower; average elevation is 600 metres
Lie parallel to the western coast along the Arabian Sea	Lie parallel to the eastern coast along the Bay of Bengal

Question 4:

Describe how the Himalayas were formed.

- **Answer**

According to the Theory of Plate Tectonics, the Earth's crust was initially a single, giant super-continent called Pangea. Its northern part was the Angara land and the southern part was the Gondwana land. The movement of the molten material below the Earth's crust caused the crust or the lithosphere to break up into a number of large fragments called lithospheric or tectonic plates. Another important feature of the Earth's crust at the time was the geosyncline—a narrow, shallow, elongated basin with a sinking bottom in which a considerable thickness of sediments were deposited by the rivers coming from Angara land and Gondwana land—called the Tethys. After separating from the Gondwana land, the Indo-Australian Plate drifted towards the north in the direction of the Eurasian Plate. This resulted in the collision of the two plates, and due to this collision, the sedimentary rocks in the Tethys got folded to form the mountain system of western Asia and the Himalayas.

Question 5:

Which are the major physiographic divisions of India? Contrast the relief of the Himalayan region with that of the Peninsular plateau.

- **Answer**

The major physiographic divisions of India are:

(i) The Himalayan Mountains

(ii) The Northern Plains

(iii) The Peninsular Plateau

(iv) The Indian Desert

(v) The Coastal Plains

(vi) The Islands

The Himalayan Region	**The Peninsular Plateau**
Having a comparatively recent origin, it is made up of young fold mountains	It is the oldest landmass of the Indian subcontinent; was part of the Gondwana land
Consists of the loftiest mountains and deep valleys	Consists of broad and shallow valleys, and rounded hills
Formed due to the collision of the Indo-Australian and Eurasian plates	Formed due to the breaking and drifting of the Gondwana land
Composed of sedimentary rocks	Composed of igneous and metamorphic rocks
From the point of view of geology, this region forms an unstable zone	This region forms a stable zone

Question 6:

Give an account of the Northern Plains of India.

- **Answer**

The Himalayan upliftment out of the Tethys Sea and the subsidence of the northern flank of the Peninsular Plateau resulted in the formation of a large basin. Gradually, the rivers flowing from the mountains in the north and the peninsular plateau in the south filled up this depression with deposits of sediments. This led to the formation of the Northern Plains of India.

The formation of the Northern Plains owes largely to the interplay of three major river systems, namely – the Indus, the Ganga and the Brahmaputra along with their tributaries. This physiographic division spreads over an area of 7 lakh square kilometres, and is 2,400 kilometres long and 320 kilometres broad. It is a densely populated region. The rich soil cover, adequate water supply and favourable climate make the region agriculturally very productive.

The Northern Plains are broadly divided into three sections.

The Punjab Plains −Western part of the Northern Plains; formed by the Indus and its tributaries

The Ganga Plains − Largest part of the Northern Plains; extends between Ghaggar and Teesta rivers

The Brahmaputra Plains − Eastern part of the Northern Plains; formed by the Brahmaputra and its tributaries

According to the variations in relief features, the Northern Plains are divided into four regions.

Bhabar – Narrow belt of pebbles lying parallel to the slopes of Shiwaliks

Terai – Wet, swampy, marshy region south of the *bhabar* belt

Bhangar – Terrace-like feature composed of older alluvium, lying above the flood plains

Khadar – Newer, younger deposits of the flood plains

Question 7:

Write short notes on the following.

(i) The Indian Desert

(ii) The Central Highlands

(iii) The Island groups of India

- **Answer**

(i) Lying towards the west of the Aravali Hills, the Indian Desert is an undulating sandy plain covered with crescent-shaped and longitudinal sand dunes. This region is characterised by very little rainfall, an arid climate and low vegetation cover. Streams appear only during the rainy season. Luni is the only large river in this region.

(ii) The part of the Peninsular Plateau lying to the north of the Narmada River, covering a major area of the Malwa Plateau, is known as the Central Highlands. They are bound by the Vindhya Range from the south and by the Aravali Hills from the northwest. The further westward extension merges with the Indian Desert while the

eastward extension is marked by the Chotanagpur Plateau. The rivers draining this region flow from southwest to northeast. The Central Highlands are wider in the west but narrower in the east.

(iii) India has two groups of islands. The Lakshadweep Islands lie in the Arabian Sea, to the southwest of the mainland. The Andaman and Nicobar Islands lie in the Bay of Bengal, to the southeast of the mainland.

Lakshadweep is composed of small coral islands, covering a small area of 32 square kilometres. Kavaratti Island is its administrative headquarters. The Andaman and Nicobar Islands are bigger in size and are more numerous and scattered. The entire group of islands is divided into Andaman (in the north) and Nicobar (in the south).

Both these island groups are rich in flora and fauna, and are of great strategic importance to the country.

Question 1:

Project/Activity

Locate the peaks, passes, ranges, plateaus, hills, and duns hidden in the puzzle. Try to find where these features are located. You may start your search horizontally, vertically or diagonally.

E	M	K	U	N	L	N	A	T	H	U	L	A	R	I	A	H	I	A	T
M	H	A	S	J	M	A	N	J	K	M	A	J	L	B	H	O	R	P	J
J	N	V	F	A	E	T	D	C	A	R	D	E	M	O	M	L	O	M	K
C	R	E	I	I	Q	H	M	O	I	F	T	N	X	M	A	X	F	C	T
N	M	T	S	N	A	U	Q	R	M	S	A	N	A	D	I	D	A	N	J
A	B	X	A	T	G	A	R	O	U	L	F	V	D	I	K	P	T	D	C
C	Y	C	H	I	G	A	M	M	R	D	T	I	Z	L	A	J	P	O	K
H	R	T	K	A	N	C	H	E	N	J	U	N	G	A	L	U	L	B	E
O	O	M	O	P	I	T	P	N	O	S	S	D	D	K	S	P	D	O	K
T	D	A	N	M	L	M	D	D	C	S	A	H	L	S	A	I	E	E	J
A	R	R	K	A	G	T	H	A	R	H	E	Y	D	H	H	A	I	A	R
N	S	A	A	L	I	A	T	L	E	I	Y	A	B	A	Y	T	H	R	L
A	Z	V	N	W	R	E	D	S	P	P	A	N	H	D	A	O	J	U	K
G	O	A	N	A	I	M	U	D	I	K	D	P	M	W	D	A	B	P	E
P	A	L	L	J	S	H	E	V	R	I	Y	E	V	E	R	E	S	T	M
U	O	I	M	Y	R	Y	P	A	T	L	I	G	J	E	I	T	H	A	R
R	K	I	Q	S	L	A	H	C	N	A	V	R	V	P	E	A	T	S	P

- **Answer**

E	M	K	U	N	L	N	A	T	H	U	L	A	R	I	A	H	I	A	T
M	H	A	S	J	M	A	N	J	K	M	A	J	L	B	H	O	R	P	J
J	N	V	F	A	E	T	D	C	A	R	D	E	M	O	M	L	O	M	K
C	R	E	I	I	Q	H	M	O	I	F	T	N	X	M	A	X	F	C	T
N	M	T	S	N	A	U	Q	R	M	S	A	N	A	D	I	D	A	N	J
A	B	X	A	T	G	A	R	O	U	L	F	V	D	I	K	P	T	D	C
C	Y	C	H	I	G	A	M	M	R	D	T	I	Z	L	A	J	P	O	K
H	R	T	K	A	N	C	H	E	N	J	U	N	G	A	L	U	L	B	E
O	O	M	O	P	I	T	P	N	O	S	S	D	D	K	S	P	D	O	K
T	D	A	N	M	L	M	D	D	C	S	A	H	L	S	A	I	E	E	J
A	R	R	K	A	G	T	H	A	R	H	E	Y	D	H	H	A	I	A	R
N	S	A	A	L	I	A	T	L	E	I	Y	A	B	A	Y	T	H	R	L
A	Z	V	N	W	R	E	D	S	P	P	A	N	H	D	A	O	J	U	K
G	O	A	N	A	I	M	U	D	I	K	D	P	M	W	D	A	B	P	E
P	A	L	L	J	S	H	E	V	R	I	Y	E	V	E	R	E	S	T	M
U	O	I	M	Y	R	Y	P	A	T	L	I	G	J	E	I	T	H	A	R
R	K	I	Q	S	L	A	H	C	N	A	V	R	V	P	E	A	T	S	P

Vertical

CHOTANAGPUR

ARAVALI

KONKAN

JAINTIA

MALWA

NILGIRI

SHIPKILA

VINDHYA

BOMDILA

SAHYADRI

SATPURA

Horizontal

NATHULA

CARDEMOM

GARO

KANCHENJUNGA

ANAIMUDI

EVEREST

PATLI

3. DRAINAGE

Question 1:

Choose the right answer from the four alternatives given below.

(i) Which one of the following describes the drainage patterns resembling the branches of a tree?

(a) Radial	(c) Centrifugal
(b) Dendritic	(d) Trellis

(ii) In which of the following states is the Wular Lake located?

(a) Rajasthan	(c) Punjab
(b) Uttar Pradesh	(d) Jammu and Kashmir

(iii) The river Narmada has its source at

(a) Satpura	(c) Amarkantak
(b) Brahmagiri	(d) Slopes of the Western Ghats

(iv) Which one of the following lakes is a salt water lake?

(a) Sambhar	(c) Wular
(b) Dal	(d) Gobind Sagar

(v) Which one of the following is the longest river of the Peninsular India?

(a) Narmada	(c) Godavari
(b) Krishna	(d) Mahanadi

(vi) Which one amongst the following rivers flows through a rift valley?

(a) Damodar	(c) Krishna
(b) Tungabhadra	(d) Tapi

- **Answer**

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(b) Tungabhadra	**(d)** Tapi ✓

Question 2:

Answer the following questions briefly.

(i) What is meant by a water divide? Give an example.

(ii) Which is the largest river basin in India?

(iii) Where do the rivers Indus and Ganga have their origin?

(iv) Name the two headstreams of the Ganga. Where do they meet to form the Ganga?

(v) Why does the Brahmaputra in its Tibetan part have less silt, despite a longer course?

(vi) Which two Peninsular rivers flow through trough?

(vii) State some economic benefits of rivers and lakes.

- **Answer**

(i) Any elevated area, such as a mountain or an upland, which separates two drainage basins is known as water divide; for example, the water divide between the Indus and the Ganga river systems. Ambala is located on this water divide. The Western Ghats form the main water divide in Peninsular India.

(ii) The Ganga, which is over 2,500 km long, forms the largest river basin in India.

(iii) The river Indus rises in Tibet, near Lake Mansarowar.

The Ganga originates at the Gangotri Glacier on the southern slopes of the Himalayas.

(iv) The two headstreams of the Ganga are Bhagirathi and Alaknanda. They meet to form the Ganga at Devaprayag in Uttarakhand.

(v) Since Tibet has a cold and dry climate, the Brahmaputra carries a smaller volume of water and less silt in this region.

(vi) Narmada and Tapi are the two peninsular rivers flowing through trough.

(vii) *Economic benefits of rivers and lakes*:

(a) Source of fresh water

(b) Irrigation

(c) Navigation

(d) Hydro-power generation

(e) Development of tourism

Question 4:

Discuss the significant difference between the Himalayan and the Peninsular rivers.

- **Answer**

Apart from their difference of origin, the Himalayan and the Peninsular rivers are different from each other in many ways. However, the significant difference between them is that while the Himalayan rivers are perennial rivers, the Peninsular rivers are seasonal. The Himalayan rivers have water throughout the year. They receive water from rain as well as from melted snow from the lofty mountains. On the other hand, the flow of Peninsular rivers is dependent upon rainfall. During the dry season, even the large rivers have reduced flow of water in their channels.

Question 5:

Compare the east-flowing and the west-flowing rivers of the Peninsular Plateau.

- **Answer**

East-flowing rivers of the Peninsular Plateau	**West-flowing rivers of the Peninsular Plateau**
Major rivers flowing eastwards: Mahanadi, Godavari, Krishna, Kaveri	Only two long rivers flow westwards: Narmada, Tapi

Flow into the Bay of Bengal	Flow into the Arabian Sea
Carry greater amount of sediments, so form deltas at their mouths	Carry lesser amount of sediments, so form estuaries at their mouths
Greater number of tributaries	Lesser number of tributaries

Question 6:

Why are rivers important for the country's economy?

- **Answer**

Rivers have been of fundamental importance throughout human history. Rivers, lakes, ice caps, ground water are the fresh water reserves of the Earth. Water is a basic natural resource, essential for various human activities. The water from the rivers is used for various domestic, industrial and agricultural purposes. The presence of rivers boosts trade and commerce by helping in the easy transport of goods. They are also a potential source of energy. The water from rivers is used for running hydro-electric dams. Regions having rivers are usually of great scenic and recreational value, and hence, serve as good tourist spots.

Question 1:

Project/Activity

Solve this crossword puzzle with the help of the given clues.

Across

1. Nagarjuna Sagar is a river valley project. Name the river?

2. The longest river of India.

3. The river which originates from a place known as Beas Kund.

4. The river which rises in the Betul district of MP and flows westwards.

5. The river which was known as the "Sorrow" if West Bengal.

6. The river on which the reservoir for Indira Gandhi canal has been built.

7. The river whose source lies near Rohtang Pass.

8. The longest river of Peninsular India.

Down

9. A tributary of Indus originating from Himachal Pradesh.

10. The river flowing through fault, drains into the Arabian Sea.

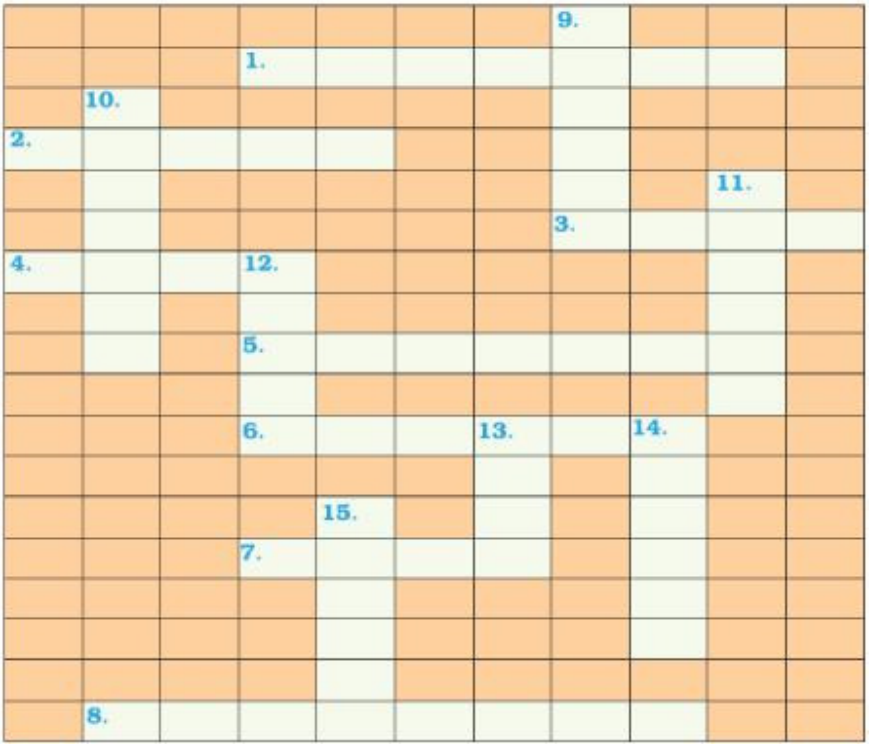
11. A river of South India, which receives rain water both in summer and winter.

12. A river which flows through Ladakh, Gilgit and Pakistan.

13. A important river of the Indian desert.

14. The river which joins Chenab in Pakistan.

15. A river which rises at Yamunotri glacier.



- **Answer**

							9. C			
			1. K	R	I	S	H	N	A	
	10. N						E			
2. G	A	N	G	A			N			
	R						A		11. K	
	M						3. B	E	A	S
4. T	A	P	12. I						V	
	D		N						E	
	A		5. D	A	M	O	D	A	R	
			U						I	
			6. S	A	T	13. L	U	14. J		
						U		H		
				15. Y		N		E		
			7. R	A	V	I		L		
				M				U		
				U				M		
				N						
	8. G	O	D	A	V	A	R	I		

4. CLIMATE

Question 1:

Choose the right answer from the four alternatives given below.

(i) Which one of the following places receives the highest rainfall in the world?

(a) Silchar	(c) Cherrapunji
(b) Mawsynram	(d) Guwahati

(ii) The wind blowing in the Northern Plains in the summers is known as

(a) *Kaal Baisakhi*	(c) Trade Winds
(b) *Loo*	(d) None of the above

(iii) Which one of the following causes rainfall during winters in north-western part of India?

(a) Cyclonic depression	(c) Western disturbances
(b) Retreating monsoon	(d) Southwest monsoon

(iv) Monsoon arrives in India approximately in

(a) Early May	(c) Early June
(b) Early July	(d) Early August

(v) Which one of the following characterises the cold weather season in India?

(a) Warm days and warm nights	(c) Cool days and cold nights
(b) Warm days and cold nights	(d) Cold days and warm nights

- **Answer**

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(b) Warm days and cold nights ✓	**(d)** Cold days and warm nights

Question 2:

Answer the following questions briefly.

(i) What are the controls affecting the climate of India?

(ii) Why does India have a monsoon type of climate?

(iii) Which part of India does experience the highest diurnal range of temperature and why?

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

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

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

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

- **Answer**

(i) The controls affecting the climate of India are: latitude, altitude, pressure and wind system, distance from the sea, ocean currents and relief features.

(ii) The climate of India is strongly influenced by monsoon winds. Hence, it has a monsoon type of climate.

(iii) The north-western part of India comprising the Indian Desert experiences the highest diurnal range of temperature. This is because of the fact that sand (found in ample quantity in this region) gains and loses heat very quickly. As a result of this phenomenon, there is a wide difference between day and night temperatures in this region. The day temperature may rise to 50°C and drop down to near 15°C the same night.

(iv) The south-west monsoon winds are responsible for rainfall along the Malabar Coast.

(v) Jet streams are a narrow belt of high-altitude winds in the troposphere. The sub-tropical westerly jet stream blowing south of the Himalayas are responsible for the western cyclonic disturbances experienced in the north and north-western parts of the country during the winter months. The sub-tropical easterly jet stream blowing over peninsular India is responsible for the tropical cyclones that affect the eastern coastal regions of India during the monsoon as well as during the October to November period.

(vi) Monsoon refers to the complete reversal of winds over a large area leading to a change of seasons.

"Break" in monsoon refers to the wet and dry spells of the monsoon. In other words, the monsoon rains take place for a few days at a time. They are interspersed with rainless intervals.

(vii) Despite variations in temperature conditions across India, a sense of unity is imposed by the monsoon. The seasonal alteration of the wind systems and the associated weather conditions provide a rhythmic cycle of seasons that binds the entire country.

Question 3:

Why does the rainfall decrease from the east to the west in Northern India?

- **Answer**

The amount of rainfall decreases from east to west in Northern India because of the progressive decrease in the humidity of the winds. As the moisture-bearing winds of the Bay of Bengal branch of the southwest monsoon move further and further inland, they exhaust most of the moisture they carry along with them. This consequently leads to a gradual decrease in the amount of rainfall from east to west.

Question 4:

Give reasons as to why.

(i) Seasonal reversal of wind direction takes place over the Indian subcontinent?

(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.

- **Answer**

(i) The seasonal reversal of wind direction over the Indian subcontinent is the result of the Coriolis force. It is an apparent force caused by the Earth's rotation. The Coriolois force is responsible for deflecting winds towards the right in the northern hemisphere and towards the left in the southern hemisphere.

(ii) The rainfall received by India is largely due to the south-west monsoon winds. 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 to land, thereby carrying moisture along with 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.

(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 Ghats that receives the maximum rain.

Question 5:

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

- **Answer**

Despite the overall unity accorded by the monsoon, there are visible regional variations in climatic conditions within India. Regardless of the moderating influences of the Himalayas in the north and the sea in the south, variations do exist in temperature, humidity and precipitation. For example, in summer, some parts of the Rajasthan desert, in north-western India, record temperatures of 50°C, while it may be around 20°C in Pahalgam in Jammu and Kashmir, in the north of the country. On a winter night, the temperature at Drass in Jammu and Kashmir may be as low as minus 45°C, while Thiruvananthapuram may have a temperature of 22°C. In general, coastal areas experience less contrasts in temperature conditions. Seasonal contrasts are more in the interior of the country.

Another case in point is precipitation. While precipitation is mostly in the form of snowfall in the upper parts of the Himalayas, it rains over the rest of the country. The annual precipitation varies from over 400 cm in Meghalaya to less than 10 cm in Ladakh and western Rajasthan. Most parts of the country receive rainfall from June to September, but some parts like the Tamil Nadu coast get most of their rain during October and November.

Question 6:

Discuss the mechanism of monsoons.

- **Answer**

During summer, a low-pressure area develops over interior Asia as well as over north and north-western India. At the same time, there is a high-pressure system over the southern Indian Ocean. Winds move from a high-pressure area to a low-pressure area. As a result, the low-pressure system attracts the southeast trade winds of the southern hemisphere. On crossing the equator, these trade winds—due to the Coriolis force—turn right towards the low-pressure areas over the Indian subcontinent. After crossing the equator, these winds start blowing in a south-westerly direction, and enter the Indian peninsula as the southwest monsoon. As these winds blow over warm oceans, they bring abundant moisture to the subcontinent. Arriving at the southern tip of the Indian peninsula, the wind system breaks up into two branches − the Arabian Sea branch and the Bay of Bengal branch. The Arabian Sea branch hits the Western Ghats, while the Bay of Bengal branch flows over the Bay of Bengal and hits the eastern Himalayas. The coastal areas west of the Western Ghats receive much of the rainfall from the Arabian Sea

Branch, while the regions lying east of the Western Ghats do not receive much rain from these winds. The north-eastern parts of the country receive much of their rainfall from the Bay of Bengal Branch. As these winds move from east to west, the moisture they carry progressively declines. As a result, rainfall decreases from east to west. The Arabian Sea branch moves towards the north-east from the south-west, and joins the Bay of Bengal branch over the northern part of the country. The duration of the monsoon is between 100 to 120 days. By the end of this period, the low pressure system over north and north-west India gradually weakens, and this leads to the retreat of the monsoon winds.

Question 7:

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

- **Answer**

The Cold Weather Season

Beginning from mid-November, the winter season lasts till February. The weather is usually marked by clear sky, low temperatures and low humidity, and feeble and variable winds. The temperature decreases from the south to the north, with the peninsular region not showing any noticeable seasonal change in temperature pattern due to the moderating influence of the sea. The coldest months are December and January. The days are generally warm and the nights are cold. Frost is common in the north and the higher slopes of the Himalayas experience snowfall.

During this season, the sub-tropical westerly jet streams blowing south of the Himalayas bring in cyclonic disturbances from the Mediterranean region. These cause winter rains over the plains and snowfall in the mountains. The Tamil Nadu coast also receives winter rainfall due to the blowing of the north-east trade winds from sea to land.

Question 8:

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

- **Answer**

Characteristics of monsoon rainfall in India:

(i) The duration of the monsoon is between 100 to 120 days from early June to mid-September.

(ii) Around the time of its arrival, the normal rainfall increases suddenly and continues for several days. This is known as the ‘burst’ of the monsoon.

(iii) The monsoon has characteristic wet and dry spells or ‘breaks’ in rainfall. The monsoon rains take place only for a few days at a time. They are interspersed with rainless intervals.

(iv) The moisture is carried by pulsating south westerlies that are affected by different atmospheric conditions, thereby giving monsoon rains an uncertain character. The annual rainfall is highly variable from year to year

(v) The rainfall is unevenly distributed across the Indian landscape. Parts of the western coast and north-eastern India receive the maximum rainfall. Regions such as parts of Rajasthan, Gujarat, Leh and the leeward side of the Western Ghats receive very little rainfall.

Effects of monsoon rainfall in India:

(a) Indian agriculture is largely dependent upon the water from the monsoon rains. Late, low or excessive rains have a negative impact upon crops.

(b) Due to the uneven distribution of rainfall across the country, there are some regions that are drought prone and some that are flood afflicted.

(c) The monsoon provides India with a distinct climatic pattern. Hence, in spite of the presence of great regional variations, it has a unifying influence upon the country and its people.

Question 1:

n 1:

Table I

Stations	Latitude	Altitude (Metres)	Jan	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Otc.	Nov.	Dec.	Annual Rainfall
Temperature (C)			20.5	22.7	25.2	27.1	26.7	24.2	23.0	23.0	23.1	22.9	18.9	20.2	
Bangalore	12 58'N	909													
Rainfall (cm)			0.7	0.9	1.1	4.5	10.7	7.1	11.1	13.7	16.4	15.3	6.1	1.3	88.9
Temperature (C)			24.4	24.4	26.7	28.3	30.0	28.9	27.2	27.2	27.2	27.8	27.2	25.0	
Mumbai	19 N	11													
Rainfall (cm)			0.2	0.2	–	–	1.8	50.6	61.0	36.9	26.9	4.8	1.0	–	183.4
Temperature (C)			19.6	22.0	27.1	30.1	30.4	29.9	28.9	28.7	28.9	27.6	23.4	19.7	
Kolkata	22 34' N	6													
Rainfall (cm)			1.2	2.8	3.4	5.1	13.4	29.0	33.1	33.4	25.3	12.7	2.7	0.4	162.5
Temperature (C)			14.4	16.7	23.3	30.0	33.3	33.3	30.0	29.4	28.9	25.6	19.4	15.6	
Delhi	29 N	219													
Rainfall (cm)			2.5	1.5	1.3	1.0	1.8	7.4	19.3	17.8	11.9	1.3	0.2	1.0	67.0
Temperature (C)			16.8	19.2	26.6	29.8	33.3	33.9	31.3	29.0	20.1	27.0	20.1	14.9	
Jodhpur	26 18' N	224													
Rainfall (cm)			0.5	0.6	0.3	0.3	1.0	3.1	10.8	13.1	5.7	0.8	0.2	0.2	36.6
Temperature (C)			24.5	25.7	27.7	30.4	33.0	32.5	31.0	30.2	29.8	28.0	25.9	24.7	
Chennai	13 4' N	7													
Rainfall (cm)			4.6	1.3	1.3	1.8	3.8	4.5	8.7	11.3	11.9	30.6	35.0	13.9	128.6

In Table-I the average mean monthly temperatures and amounts of rainfall of ten representative stations have been given. It is for you to study on your own and convert them into 'temperature and rainfall' graphs. A glance at these visual representations will help you to grasp instantly the similarities and differences between them. One such graph (Figure 1) is already prepared for you. See if you can arrive at some broad generalisations about our diverse climatic conditions. We hope you are in for a great joy of learning. Do the following activities.

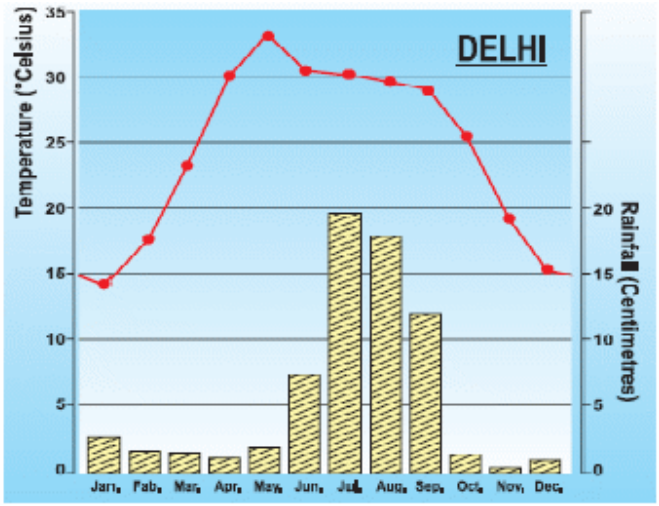
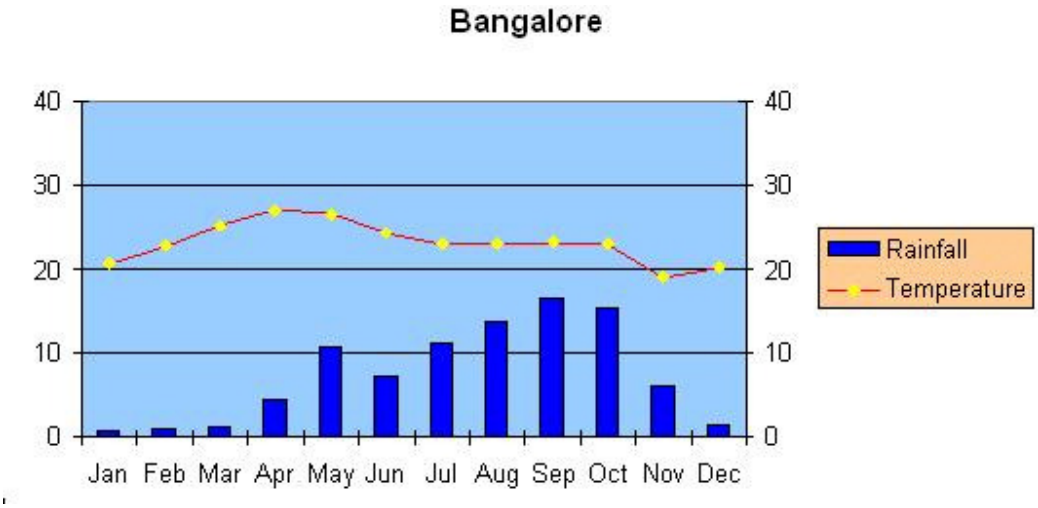
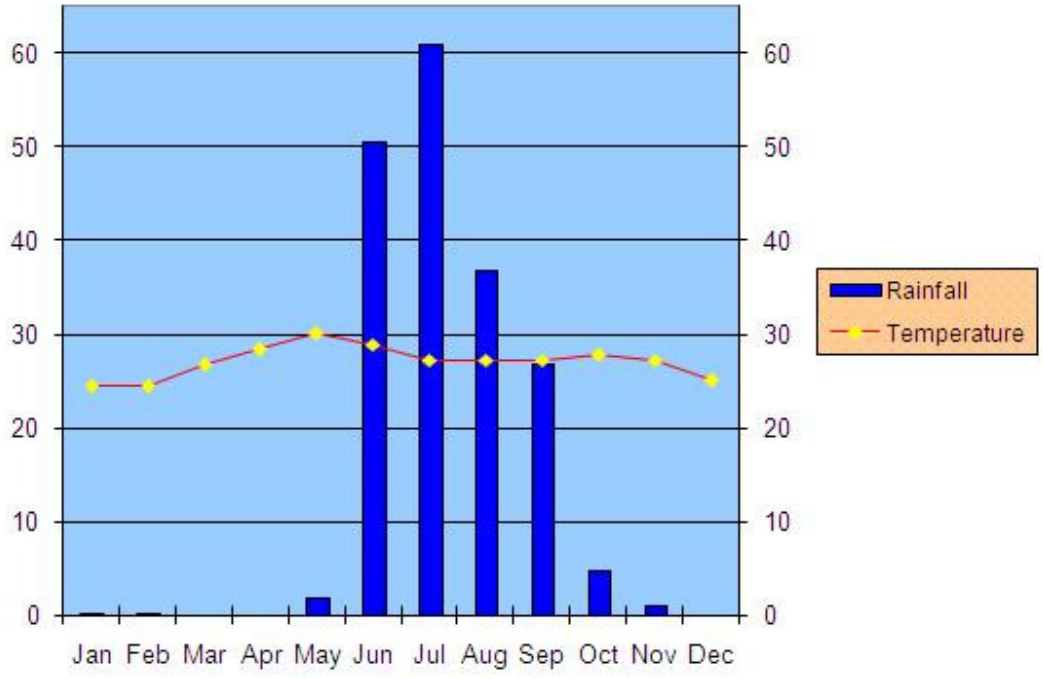


Figure 1: **Temperature and Rainfall of Delhi**

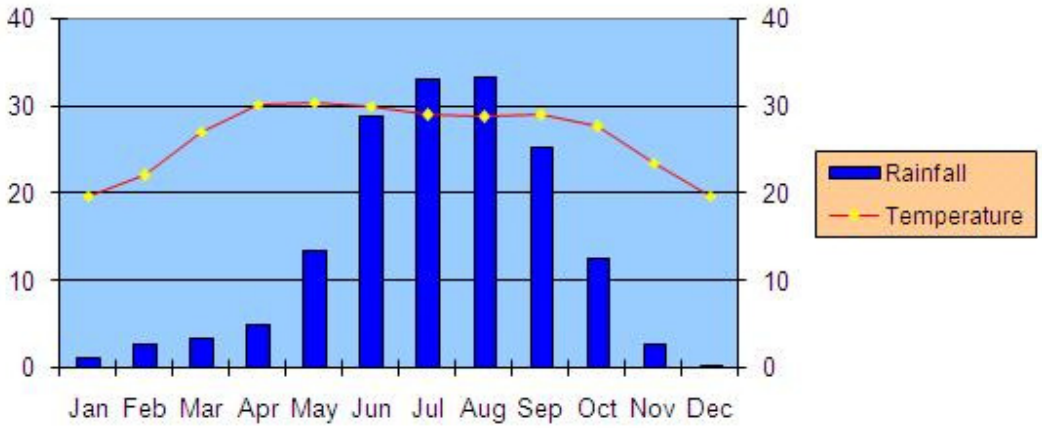
- **Answer**



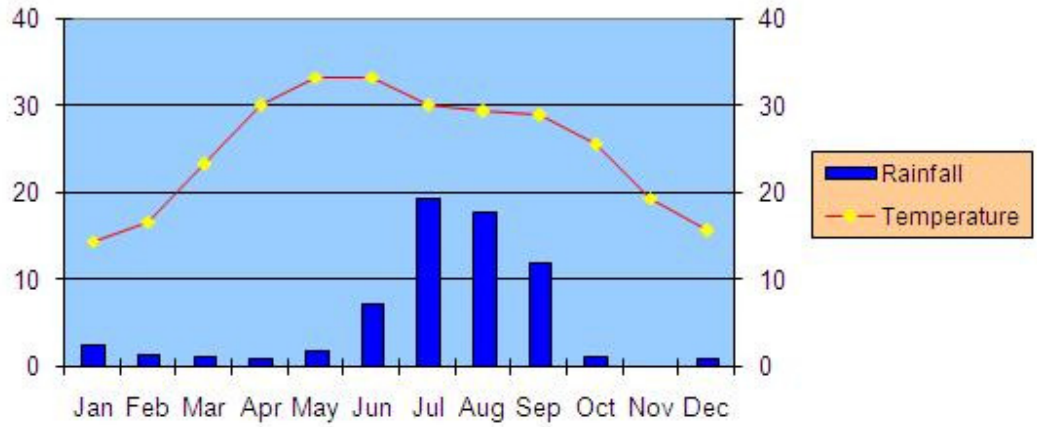
Mumbai



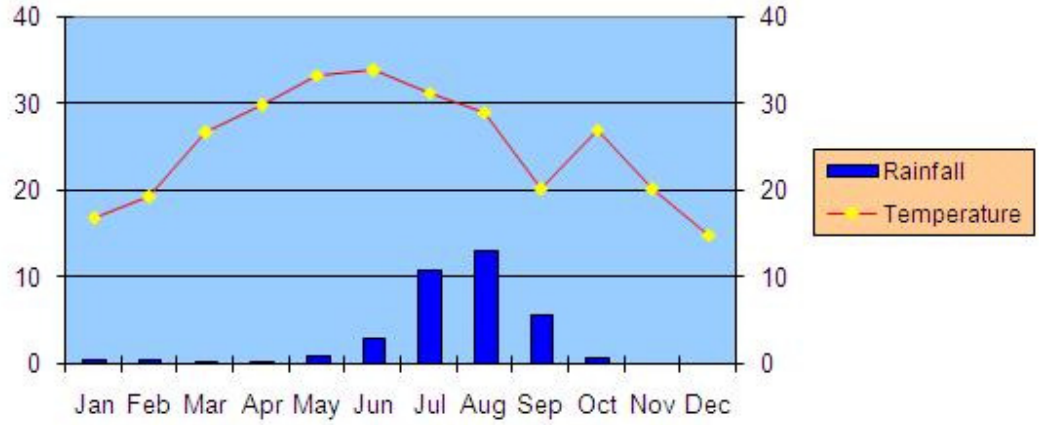
Kolkata



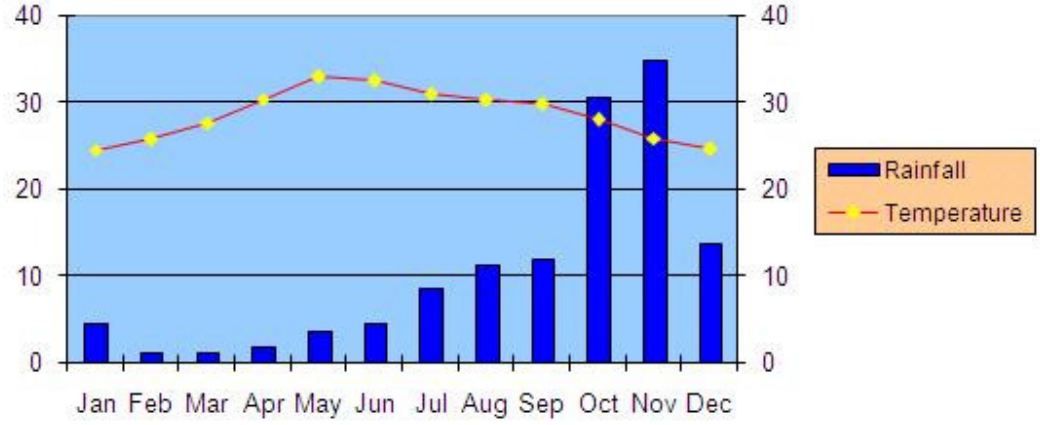
Delhi



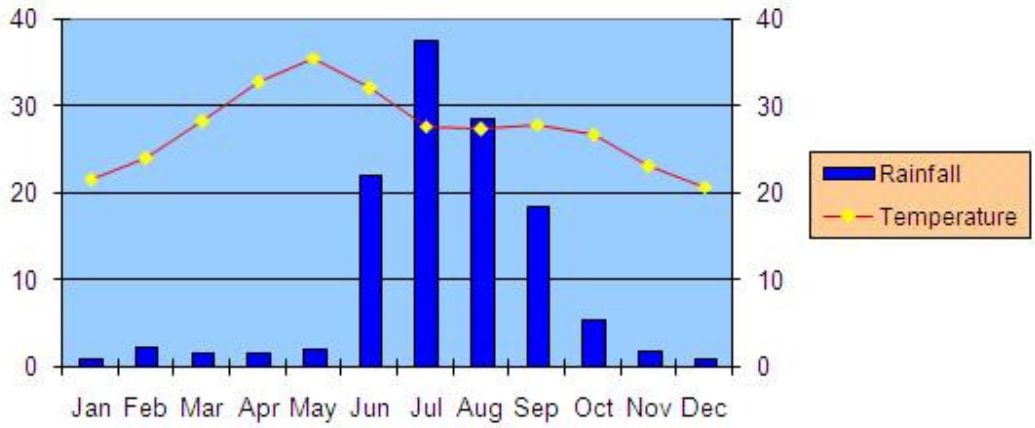
Jodhpur



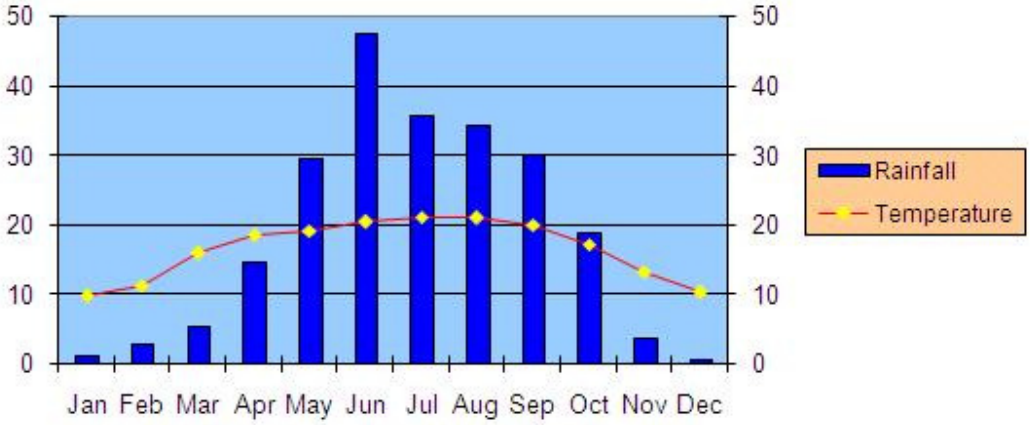
Chennai



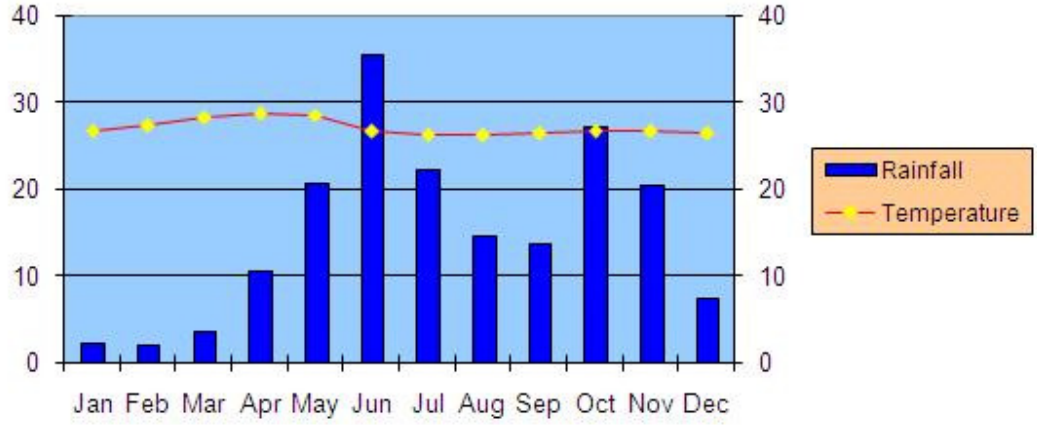
Nagpur

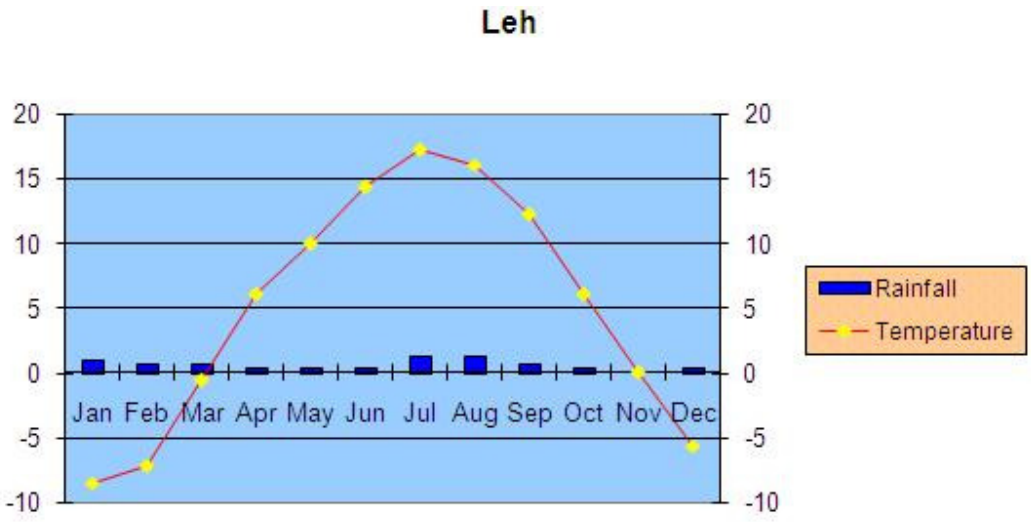


Shillong



Tiruvanantapuram





Question 2:

Re-arrange the ten stations in two different sequences:

(i) According to their distance from the equator.

(ii) According to their altitude above mean sea-level.

- **Answer**

(i) ***According to their distance from the equator*****:**

Tiruvanantapuram (**closest**)

Bangalore

Chennai

Mumbai

Nagpur

Kolkata

Shillong

Jodhpur

Delhi

Leh (**farthest**)

(ii) ***According to their altitude above mean sea-level*****:**

Kolkata (**lowest**)

Chennai

Mumbai

Tiruvanatapuram

Delhi

Jodhpur

Nagpur

Bangalore

Shillong

Leh (**highest**)

Question 3:

(i) Name two rainiest stations.

(ii) Name two driest stations.

(iii) Two stations with most equable climate.

(iv) Two stations with most extreme climate.

(v) Two stations most influenced by the Arabian branch of southwest monsoons.

(vi) Two stations most influenced by the Bay of Bengal branch of south-west monsoons.

(vii) Two stations influenced by both branches of the south-west monsoons

(viii) Two stations influenced by retreating and north-east monsoons.

(ix) Two stations receiving winter showers from the western disturbances.

(x) The two hottest stations in the months of

(a) February (b) April (c) May (d) June

- **Answer**

(i) ***Two rainiest stations***: Shillong and Mumbai

(ii) ***Two driest stations***: Leh and Jodhpur

(iii) ***Two stations with most equable climate***: Bangalore and Tiruvanantapuram

(iv) ***Two stations with most extreme climate***: Leh and Jodhpur

(v) ***Two stations most influenced by the Arabian branch of southwest monsoons***: Tiruvanatapuram and Mumbai

(vi) ***Two stations most influenced by the Bay of Bengal branch of south-west monsoons***: Shillong and Kolkata

(vii) ***Two stations influenced by both branches of the south-west monsoons***: Delhi and Kolkata

(viii) ***Two stations influenced by retreating and north-east monsoons***: Chennai and Bangalore

(ix) ***Two stations receiving winter showers from the western disturbances***: Jodhpur and Delhi

(x) ***The two hottest stations –***

(a) ***In the month February***: Tiruvanatapuram and Chennai

(b) ***In the month April***: Nagpur and Kolkata

(c) ***In the month of May***: Nagpur and Jodhpur

(d) ***In the month of June***: Jodhpur and Delhi

Question 4:

Now find out:

(i) Why are Tiruvanantapuram and Shillong rainier in June than in July?

(ii) Why is July rainier in Mumbai than in Tiruvanantapuram?

(iii) Why are south-west monsoons less rainy in Chennai?

(iv) Why is Shillong rainier than Kolkata?

(v) Why is Kolkata rainier in July than in June unlike Shillong which is rainier in June than in July?

(vi) Why does Delhi receive more rain than Jodhpur?

- **Answer**

(i) The south-west monsoons hit Tiruvanantapuram and Shillong around the first of June. Tiruvanantapuram receives rain from the Arabian Sea branch while Shillong receives rain from the Bay of Bengal branch. After causing rains in these regions, these two branches keep moving on to the other parts of the country (the Arabian Sea Branch moves from south-west to north-east, while the Bay of Bengal branch moves from north-east to north-west). As a result, these regions receive lesser rainfall in the months succeeding June.

(ii) The Arabian Sea branch of the south-west monsoons reaches Tiruvanantapuram around the first of June. It reaches Mumbai around the tenth of June. So, Tiruvanantapuram receives much of its rainfall in the month of June, while Mumbai receives much of its rainfall in the month of July.

(iii) Chennai lies on the leeward side of the Western Ghats, and far away from the western coast. The Arabian Sea branch causes greater rainfall on the western coastline, while the eastern branch passes over Bay of Bengal, on to the north-eastern part of the country. As a result, Chennai gets low rainfall from the south-west monsoons.

(iv) Shillong is enclosed by hills and mountains, which causes the Bay of Bengal branch of the south-west monsoons to accumulate in this region. This is the reason why this region experiences heavy rainfall. On the other hand, Kolkata does not lie in a hilly area. Thus, it receives lesser rainfall as compared to Shillong.

(v) The Bay of Bengal branch of the south-west monsoons reaches Shillong around the first of June. It gradually progresses from east to west. As a result, the amount of rainfall received by this region decreases from June to July. The monsoon winds reach Kolkata later than they arrive in Shillong. Hence, Kolkata receives more rainfall in July.

(vi) Due to the progressive decrease in the humidity of the monsoon winds, the amount of rainfall decreases from east to west in northern India. Delhi lies to the east of Jodhpur. Hence, the former receives more rain than the latter.

Question 5:

Now think why

— Tiruvananthapuram has equable climate?

— Chennai has more rains only after the fury of monsoon is over in most parts of the country?

— Jodhpur has a hot desert type of climate?

— Leh has moderate precipitation almost throughout the year?

— While in Delhi and Jodhpur most of the rain is confined to nearly three months, in

Tiruvanantapuram and Shillong it is almost nine months of the year?

In spite of these facts see carefully if there are strong evidences to conclude that the monsoons still provide a very strong framework lending overall climatic unity to the whole country.

- **Answer**

Tiruvanantapuram has an equable climate because of its proximity to the sea. The sea exerts a moderating influence on the climate of the region.

For most parts of the country, the months of October to November form a period of transition from hot rainy season to dry winter conditions. However, Chennai experiences a lot of rainfall during this period because of the retreating monsoons, and also because of the tropical cyclones.

Jodhpur lies in the north-western part of the country. The Great Indian Desert is located in this region. Due to the presence of sand, the region experiences high diurnal range of temperature. Hence, Jodhpur has a hot desert type of climate.

While it receives scanty rainfall throughout the year, Leh does experience snowfall due to the extremely low temperatures. As a result, it experiences moderate precipitation almost throughout the year.

Being located in the interior parts of the country, Delhi and Jodhpur receive rainfall mostly from the south-west monsoons. Hence, the rains in these regions are confined to the monsoon period. While Tiruvanantapuram and Shillong do receive heavy rains during the monsoons, their proximity to the sea makes them experience rains apart from the ones received during the monsoon period.

Though factors like wind systems, pressure, latitude, altitude, distance from the sea, presence of mountains, etc., are responsible for the presence of variations across the country, the seasonal arrival and retreat of monsoons provides a kind of climatic unity to the entire country. In spite of the differences, a distinct climatic pattern is evident—a climate characterised by hot rainy summers and cold dry winters.

5. NATURAL VEGETATION AND WILD LIFE

Question 1:

Choose the right answer from the four alternatives given below.

(i) To which one of the following types of vegetation does rubber belong?

(a) Tundra	(c) Himalayan
(b) Tidal	(d) Tropical Evergreen

(ii) Cinchona trees are found in the areas of rainfall more than

(a) 100 cm	(c) 70 cm
(b) 50 cm	(d) less than 50 cm

(iii) In which of the following states is the Simlipal bio-reserve located?

(a) Punjab	(c) Delhi
(b) Orissa	(d) West Bengal

(iv) Which one of the following bio-reserves is **not** included in the world network of bio-reserves?

(a) Manas	(c) Gulf of Mannar
(b) Dihang-Dibang	(d) Nanda devi

- **Answer**

(i) To which one of the following types of vegetation does rubber belong?

(a) Tundra	**(c)** Himalayan
(b) Tidal	**(d)** Tropical Evergreen ✓

(ii) Cinchona trees are found in the areas of rainfall more than

(a) 100 cm ✓	**(c)** 70 cm
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(iv) Which one of the following bio-reserves is **not** included in the world network of bio-reserves?

(a) Manas ✓	**(c)** Gulf of Mannar
(b) Dihang-Dibang	**(d)** Nanda devi

Question 2:

Answer the following questions briefly.

(i) Define an ecosystem.

(ii) What factors are responsible for the distribution of plants and animals in India?

(iii) What is a bio-reserve? Give two examples.

(iv) Name two animals having habitat in tropical and montane type of vegetation.

- **Answer**

(i) Ecosystem is a system of interdependence comprising the physical environment and the organisms living therein.

(ii) Temperature, humidity, precipitation, land and soil are the factors responsible for the distribution of plants in India. The nature of plants in an area, to a large extent, determines the animal life of that area.

(iii) A bio-reserve is a conserved ecosystem. It is managed in such a way that not only is its biodiversity preserved but also its resources are used in a sustainable manner for the benefit of the local communities. Examples: The Nilgiris, Sunderbans

(iv) Tropical animals – Tiger, elephant

Montane animals – Snow leopard, spotted deer

Question 3:

Distinguish between

(i) Flora and fauna

(ii) Tropical evergreen and deciduous forests

- **Answer**

(i) Flora: This term denotes the species of plants of a particular region or period

Fauna: This term denotes the species of animals of a particular region or period.

(ii)

Tropical Evergreen Forests	Tropical Deciduous Forests
Present in areas receiving more than 200 cm of rainfall	Present in areas receiving rainfall between 200 cm and 70 cm
Since the region is warm and wet throughout the year, there is no definite time for the trees to shed their leaves	The trees shed their leaves for about six to eight weeks in dry summer
Examples: ebony, mahogany, rubber, rosewood	Examples: teak, bamboo, sandalwood, peepal, neem
Common animals found in these forests are elephants and monkeys.	Common animals found in these forests are lions and tigers
In India, these forests are located in the heavy rainfall areas of Western Ghats and the island groups of Lakshadweep and Andaman and Nicobar, upper parts of Assam and Tamil Nadu coast	The wet deciduous forests are located in the eastern part of India – northeastern states, along the foothills of the Himalayas, Jharkhand, West Orissa and Chattisgarh, and on the eastern slopes of Western Ghats. The dry deciduous forests are located in the rainier parts of the Peninsular Plateau and the plains of Bihar and Uttar Pradesh.

Question 4:

Name different types of vegetation found in India and describe the vegetation of high altitudes.

- **Answer**

The different types of vegetation found in India are:

(i) Tropical Evergreen Forests

(ii) Tropical Deciduous Forests

(iii) Tropical Thorn Forests and Scrubs

(iv) Montane Forests

(v) Mangrove Forests

A description of the vegetation of high altitudes:

In mountainous regions, there is a succession of natural vegetation belts in the same order as we see from the tropical to the tundra regions.

(a) The **wet temperate types of forests** are found between a height of 1,000 and 2,000 metres. Evergreen broad-leaf trees such as oaks and chestnuts are predominant in this area.

(b) Between 1,500 and 3,000 metres, **temperate forests containing coniferous trees** like pine, deodar and spruce are found. These forests cover mostly the southern slopes of the Himalayas and places having high altitude in southern and north-east India.

(c) At higher elevations, **temperate grasslands** are common.

(d) At altitudes higher than 3,600 metres, temperate forests and grasslands give way to the **alpine vegetation**. Silver fir, pines and birches are the common trees of these forests. They get progressively stunted as they approach the snow-line.

(e) Ultimately through **shrubs and scrubs**, they merge into the **alpine grasslands**.

(f) At higher altitudes, **mosses and lichens** form part of **tundra vegetation**.

Question 5:

Quite a few species of plants and animals are endangered in India. Why?

- **Answer**

Due to the excessive exploitation of the plant and animal resources by human beings, the ecosystem has been disturbed. In consequence, about 1,300 plant species are endangered and 20 species are extinct. Quite a few animal species are also endangered and some have become extinct.

Apart from hunting, other factors that have caused endangerment of plant and animal species are: pollution due to chemical and industrial waste, and acid deposits; introduction of alien species; reckless cutting of forests to bring land under cultivation and inhabitation.

Question 6:

Why has India a rich heritage of flora and fauna?

- **Answer**

India has all the major physical features of the Earth, i.e., mountains, plains, deserts, plateaus and islands. The different regions of the country have different soil types. Though India has an essentially monsoon-type of climate, there exists great variations in humidity and temperature across the country. Even the rains brought by the monsoon winds are unevenly distributed. Hence, each factor responsible for the type of flora and fauna in an area, namely land, soil, temperature, humidity and precipitation, are variable across the length and breadth of the country. As a result, the flora and fauna found in India is diverse and rich.

6. POPULATION

Question 1:

Choose the right answer from the four alternatives given below.

(i) Migrations change the number, distribution and composition of the population in

(a) The area of departure	(c) Both the area of departure and arrival
(b) The area of arrival	(d) None of the above

(ii) A large proportion of children in a population is a result of

(a) high birth rates	(c) high death rates
(b) high life expectancies	(d) more married couples

(iii) The magnitude of population growth refers to

(a) The total population of an area
(b) The number of persons added each year
(c) The rate at which the population increases
(d) The number of females per thousand males

(iv) According to the Census 2001, a "literate" person is one who

(a) Can read and write his/her name
(b) Can read and write any language
(c) Is 7 years old and can read and write any language with understanding
(d) Knows the 3 'R's (reading, writing, arithmetic)

- **Answer**

(i) Migrations change the number, distribution and composition of the population in

(a) The area of departure	**(c)** Both the areas of departure and arrival ✓
(b) The area of arrival	**(d)** None of the above

(ii) A large proportion of children in a population is a result of

(a) high birth rates ✓	**(c)** high death rates
(b) high life expectancies	**(d)** more married couples

(iii) The magnitude of population growth refers to

(a) The total population of an area
(b) The number of persons added each year ✓
(c) The rate at which the population increases
(d) The number of females per thousand males

(iv) According to the Census 2001, a "literate" person is one who

(a) Can read and write his/her name
(b) Can read and write any language
(c) Is 7 years old and can read and write any language with understanding ✓
(d) Knows the 3 'R's (reading, writing, arithmetic)

Question 2:

Answer the following questions briefly.

(i) Why is the rate of population growth in India declining since 1981?

(ii) Discuss the major components of population growth.

(iii) Define age structure, death rate and birth rate.

(iv) How is migration a determinant factor of population change?

- **Answer**

(i) Since 1981, birth rates have been declining gradually. As a result, there has been a gradual decline in the rate of population growth.

(ii) The major components of population growth are natural increase of population and immigration. Natural increase of a population is the difference between the birth rates and the death rates in that population. Immigration refers to the inflow of people into a region from other regions.

(iii) The age structure of a population refers to the number of people in different age groups in that population.

Death rate is the number of deaths per thousand persons in a year.

Birth rate is the number of live births per thousand persons in a year.

(iv) Migration is the movement of people across regions and territories. It is a determinant factor of population change as it changes the demographics (size and composition) of both the areas of departure and arrival.

Question 3:

Distinguish between population growth and population change.

- **Answer**

Population Growth	Population Change
It refers to the increase in the number of inhabitants of a region during a specific period of time.	It refers to the change in the distribution, composition or size of a population during a specific period of time.
Natural increase of population and immigration are the major components causing population growth.	Natural increase, immigration and emigration are the major components causing population change.

Question 4:

What is the relation between occupational structure and development?

- **Answer**

The distribution of the population according to the different types of occupations is referred to as the occupational structure. Occupations are generally classified as primary (agriculture, mining, fishing, etc.), secondary (manufacturing industry, building and construction work, etc.) and tertiary (transport, communications, banking, etc.).

The proportion of people working in different activities reflects the economic development of a country. Developed nations have a high proportion of people in secondary and tertiary activities. Developing countries tend to have a higher proportion of their workforce engaged in primary activities.

Question 5:

What are the advantages of having a healthy population?

- **Answer**

Health is an important composition of population composition affecting the process of development. A healthy population is an asset to the country. A healthy individual is much more efficient and productive than an unhealthy individual. He or she is able to realise his or her potential, and play an important role in social and national development.

Question 6:

What are the significant features of the National Population Policy 2000?

- **Answer**

The National Population Policy 2000 provides a policy framework for:

(i) Imparting free and compulsory school education up to 14 years of age

(ii) Reducing infant mortality rate to below 30 per 1000 live births

(iii) Achieving universal immunisation of children against all vaccine-preventable diseases

(iv) Promoting delayed marriage and child bearing

(v) Making family welfare a people-centred programme

(vi) Providing nutritional services and food supplements to adolescents

(vii) Protecting adolescents from unwanted pregnancies and sexually-transmitted diseases, and educating them about the risks of unprotected sex

(viii) Making contraceptive services accessible and affordable