

### 3. Physiography and Drainage

#### Exercise

##### 1 A. Question

Complete the sentences by choosing the right option:

Brazil is covered mainly by.....

- A. Highlands.
- B. Plains.
- C. Mountainous region.
- D. Dissected hills.

#### Answer

Brazil has an extensive network of highlands in the region. They make up more than half of the country's landmass and are the main source of the nation's abundant mineral resource. They are recognized for their diversity.

##### 1 B. Question

Complete the sentences by choosing the right option:

Like Brazil, India too has.....

- A. high mountains.
- B. ancient plateau.
- C. west-flowing rivers.
- D. snow-capped mountains.

#### Answer

India is covered by a dense network of the Himalayas which extend towards Tajikistan in the East. Brazil, too, has an extensive network of highlands in the region. They make up more than half of the country's landmass and are the main source of the nation's abundant mineral resource

##### 1 C. Question

Complete the sentences by choosing the right option:

The Amazon Basin is mainly.....

- A. characterized by droughts.
- B. filled by swamps.
- C. covered by dense forests.
- D. fertile.

#### Answer

The *Amazon basin* is the largest tropical rainforest in the world. Most of it has dense tropical rainforests which are largely inaccessible because of frequent flooding and dense undergrowth. They are often called "lungs of the world" as they provide extensive ecological services for the planet.

##### 1 D. Question

Complete the sentences by choosing the right option:

Amazon is a large river in the world. Near its mouth.....

- A. deltaic regions are found.
- B. no deltas are found.

C. deposition of sediments occurs.

D. fishing is done.

### **Answer**

Since Amazon washes off the load supplied to it from the catchment, sediments do not deposit at the mouth. The *Amazon basin* is the largest tropical rainforest in the world. Most of it has dense tropical rainforests which are largely inaccessible because of frequent flooding and dense undergrowth. They are often called “lungs of the world” as they provide extensive ecological services for the planet.

### **1 E. Question**

Complete the sentences by choosing the right option:

The Lakshadweep Islands of Arabian Sea is.....

A. made from the part separated from the mainland.

B. coral islands.

C. volcanic islands.

D. continental islands.

### **Answer**

Lakshadweep is a uni-district Union Territory and is comprised of 12 atolls, three reefs, five submerged banks, and ten inhabited islands. These are coral atoll group situated at a distance of 200-300km from the West Coast of India.

Note:

Volcanic islands: Under the sea, *volcanoes* erupt, building land until they break the surface as a new *island*. Layers of lava build up until a ridge breaks the sea's surface to form an island. E.g., *Southeast Asia*; *Indonesia* and *Papua New Guinea*, the *Philippine Islands*.

Continental islands: *Continental islands* are bodies of land that lie on the continental shelf of a continent. Examples include Borneo, Java, and Sumatra off Asia.

### **1 F. Question**

Complete the sentences by choosing the right option:

To the foot hills of The Aravalis ..... .

A. lies the Bundelkhand Plateau.

B. lies the Mewad Plateau.

C. lies the Malwa Plateau.

D. lies the Deccan Plateau.

### **Answer**

Malwa Plateau lies between the Aravali and Vindhya ranges. It is of volcanic origin, which is located in central North India. It is bounded by the Madhya Bharat Plateau and Bundelkhand Upland to the north, the Vindhya Range to the east and south, and the Gujarat Plains to the west.

### **2 A. Question**

Answer the following questions:

Differentiate between the physiography of Brazil and India.

### **Answer**

India – major physiographic divisions	Brazil – major physiographic divisions
The Himalayas: across the northeastern portion of India and made up of three parallel ranges often referred to as the Greater Himalayas, the Lesser Himalayas, and the Outer Himalayas.	The Highlands: They make up more than half of the country's landmass and are the main source of the nation's abundant mineral resource. They are recognized for their diversity.
The North Indian Plains: made by the Ganges River in the northern parts of India and the border surrounding areas of the Himalayas	The Great Escarpment: plateau edge of southern Africa that separates the region's highland interior plateau from the fairly narrow coastal strip.
The Peninsula: India is surrounded by water on three sides; the Bay of Bengal in the East, Arabian sea in the west and the Indian Ocean in the South.	The Plains: Pampas are vast plains extending westward across central Argentina from the Atlantic coast to the Andean foothills.

## 2 B. Question

Answer the following questions:

What measures are being taken to control pollution in the rivers of India?

### Answer

India has a large network of rivers, but to increasing industrialization, urbanisation, etc., the pollution in these rivers has increased greatly. Following measures have been adopted to control river pollution:

- \* Proper treatment of sewage and management
- \* Installation of monitoring systems to keep a direct check on the effluent discharge in the rivers
- \* Rigorous assessment of water quality through monitoring systems

## 2 C. Question

Answer the following questions:

Explain the characteristics of the North Indian Plains.

### Answer

Characteristics of the North Indian Plains:

- \* This division lies between the Himalaya Mountains in the north and the Peninsula in the south, extending from Rajasthan and Punjab in the west to Assam in the east. It is mostly a flat, low-lying area.
- \* The North Indian Plains are divided into two parts. The part lying to the east of the Aravalis is the basin of the river Ganga and is therefore known as the Ganga Plains. It slopes eastward. The western part of the North Indian Plains is occupied by desert, known as the Thar Desert or Marusthali. Most of Rajasthan is occupied by this desert.
- \* The plains of Punjab lie to the north of the Thar desert. This region is spread to the west of Aravalis and Delhi ranges which have formed as a result of the depositional work by river Sutlej and its tributaries. The slope of the plains is towards the west.

Since the soil here is very fertile, agriculture is largely practised in this region.

## 2 D. Question

Answer the following questions:

What could be the reasons behind the formation of swamps in the extensive continental location of Pantanal?

### Answer

Pantanal is one of the largest wetlands in the world, lying towards the southwest part of the highland areas. It is a region of swamps and marshes in northwestern Mato Grosso do Sul in Brazil and, extending into Argentina too. It is a very precious resource of Brazil, home to an array of plant- and animal species.

Water from the Planalto highlands flows into the gradually-sloped, large depression of Pantanal. From there,

the water flows out as the Paraguay River and its tributaries. The Pantanal forms a vast swampy area as a result of deposits from the several rivers and water systems flowing into it.

## **2 E. Question**

Answer the following questions:

Which are the major water divides of India giving examples?

### **Answer**

Major water divides of India-

\* Sindhu river system - comprises the main Indus and its major tributaries - Jhelum, Chenab, Ravi, Satluj.

\* Ganga river system - its tributaries include Yamuna, Brahmaputra, Chambal, Ken, Betwa, Son, Damodar. It is 2525 km long; rises in the western Himalayas in the Indian state of Uttarakhand and empties in the Bay of Bengal.

\* Tapi and Narmada are among the few Indian rivers which flow towards the Arabian sea. It is because they don't form valleys, and instead they flow through faults (linear rift, rift valley, trough) created due to the bending of the northern peninsula during the formation process of Himalayas.

\* Mahi river flows from North East to South West direction, and Sabarmati flows in the North-South direction.

\* Important river systems towards the Bay of Bengal include Mahanadi, Godavari, Krishna, and Kaveri.

## **3 A. Question**

Write notes on:

Amazon River basin

### **Answer**

#### **Amazon River Basin**

Amazon collects its headwaters from the eastern slopes of Andes Mountains in Peru. It receives a huge discharge, about 2 lakh m<sup>3</sup>/s. As a result, Amazon washes off the load supplied to it from the catchment. Consequently, sediments are not deposited even at the mouth. A dense network of distributaries, which is a characteristic feature of river mouth areas, is by and large absent in the mouth region of Amazon. Instead, a series of islands developed along the mouth of Amazon beyond the coastline into the Atlantic Ocean can be found. Most of the course of the Amazon river is suitable for navigation.

## **3 B. Question**

Write notes on:

Himalayas

### **Answer**

**Himalayas** - The Himalayas are one of the young fold mountains in the world, extending from the Pamir Knot in Tajikistan to the east. It is a major mountain system of the Asian continent. In India, it extends from Jammu and Kashmir to Arunachal

Pradesh. The Himalayas is not a single mountain range, but there are many parallel ranges in the system. The southernmost is known as Siwaliks, the youngest range. Next to Siwaliks are Lesser Himalayas, Greater Himalayas (Himadri) and Trans Himalayan range from south to north. These ranges are young to old respectively. These mountain ranges are also divided

into Western Himalayas (or Kashmir Himalayas), Central Himalayas (or Kumaun Himalayas) and Eastern Himalayas (or Assam Himalayas).

## **3 C. Question**

Write notes on:

The coasts of Brazil

### **Answer**

**The coasts of Brazil** - Brazil has a coastline of about 7400 km. It can be divided into two parts namely the

northern and eastern coast.

1. The northern coast extends from Amapa province in the north to Rio de Grande de Norte in the east. It can be called as the North Atlantic coast.
2. From there, the eastern coast extends towards the south. The northern coast is characterized by mouths of many rivers including the Amazon. Therefore this region is a low-lying region.
3. On this coast lie the Marajo island, Marajo and Sao Marcos Bays. Marajo is a large coastal island located between the mouths of River Amazon and River Tocantins.
4. The eastern coast receives a large number of smaller rivers. The only major river which meets the Atlantic Ocean here is Sao Francisco.
5. The Brazilian coast is characterized by a large number of beaches and sand dune complexes. It is also protected in some areas by coral reefs and atoll islands.

### **3 D. Question**

Write notes on:

The Indian peninsula

#### **Answer**

**The Indian peninsula** – The area lying to the south of North Indian Plains and tapering towards the Indian Ocean is called the Indian Peninsula. It consists of many plateaus and hill ranges. The Aravalis in the north is the oldest fold mountains here which include a series of plateaus bordering the Plains, Vindhyas and Satpuda ranges in the central part and the hilly regions of Western and Eastern Ghats.

### **3 E. Question**

Write notes on:

The Great Escarpment

#### **Answer**

**The Great Escarpment** – The Great Escarpment, although, occupies a very small area, the nature of its slope and the effect it has on the climate makes it a separate physiographic region. The eastern side of the Highlands is demarcated because of the escarpment. In this region, the altitude of the escarpment is 790m. In some regions, the height decreases gradually. The escarpment is very steep particularly from Sao Paulo to Porto Alegre. The escarpment act as a barrier to the Southeast Trade winds giving rise to the rain- -shadow area in the northeastern part of the highlands. The region to the north of this area is called 'Drought Quadrilateral.'

### **4 A. Question**

Write geographical reasons.

There are no west-flowing rivers in Brazil.

#### **Answer**

A number of rivers take off from the terminal portion of the highlands and flow northwards to meet the Atlantic Ocean which lies on the eastern border of Brazil. Some major rivers like Uruguay, Paraguay, and Parana originate from the southern slopes of the highlands and enter Argentina. The highlands gradually slope towards north which appears in the form of an escarpment. Hence, there are no west-flowing rivers in Brazil.

### **4 B. Question**

Write geographical reasons.

There are dissimilarities between the eastern and western coasts of India.

#### **Answer**

The western coast borders the Arabian Sea. It is by and large a rocky coast. At places, spurs taking off from the Western Ghats have extended right up to the coast. Its width is also less compared to the east coast. Rivers originating from the Western Ghats are short and swift, and hence they form estuaries and not deltas.

The eastern coast borders the Bay of Bengal. It has formed as a result of depositional work of rivers. Many east flowing rivers using from the Western and Eastern Ghats meet this coast. Since the slope of the land is gentle, rivers flow at lower velocities and deposit the sediments brought with them at the coast. As a result, deltas are found along this coast.

#### **4 C. Question**

Write geographical reasons.

There are fewer natural ports on the eastern coast of India.

#### **Answer**

The eastern coast borders the Bay of Bengal. It has formed as a result of depositional work of rivers. The east flowing rivers from all parts of the country empty in the Bay of Bengal on the east coast. Since the slope of the land is gentle, rivers flow at lower velocities and deposit the sediments brought with them at the coast. As a result, deltas are found along this coast. It is therefore difficult for ships to reach the East coast thus indicating less likely conditions favorable for the establishment of natural ports.

#### **4 D. Question**

Write geographical reasons.

As compared to Amazon, pollution in river Ganga will affect human life greatly.

#### **Answer**

The major reason behind the river Ganga impacting human life on a large scale is that millions of people depend on it for their livelihood. Further, the extent of pollution in the Ganga has not only led to many fatal diseases such as cancer but has also led to a massive loss of aquatic life.

Amazon, on the other hand, has a different set of factors such as inaccessibility due to frequent flooding and dense undergrowth as the plains are mainly covered by tropical rainforests.

#### **5 A. Question**

Identify the correct group

(a) The order of physiographic units in Brazil while going from North-West to South-East.

(i) Parana River basin- Guyana Highlands- Brazilian Highlands

(ii) Guyana Highlands- Amazon river basin - Brazilian Highlands

(iii) Coastal Plains - Amazon river basin- Brazilian Highlands

(b) These rivers of Brazil are north-flowing

(i) Juruika- Xingu- Aragua

(ii) Negro-Branco-Paru

(iii) Japura-Jarua-Purus

(c) The order of plateaus of India from south to north

(i) Karnataka- Maharashtra-Bundelkhand

(ii) Chhota Nagpur- Malwa- Marwad

(iii) Telangana-Maharashtra-Marwad

#### **Answer**

(a)-(i) Parana River basin- Guyana Highlands- Brazilian Highlands

(b)-(iii) Japura-Jarua-Purus

(c)-(i) Karnataka- Maharashtra-Bundelkhand

#### **6. Question**

Look at the digital elevated model (DEM) of India and name the major physiographic divisions



## Answer

Following are the physiographic divisions:

- \* The Himalayas
- \* The Coastal Plains
- \* The North Indian Plains

### Note: **The Himalayas:**

The Himalayas are one of the young fold mountains in the world, extending from Pamir Knot in Tajikistan to the east. It is a major mountain system of the Asian continent. In India, it extends from Jammu and Kashmir to Arunachal Pradesh.

The Himalayas is not a single mountain range but there are many parallel ranges in the system. The southernmost is known as Siwaliks, the youngest range. Next to Siwaliks are Lesser Himalayas, Greater Himalayas (Himadri) and Trans Himalayan ranges from south to north. These ranges are young to old respectively. These mountain ranges are also divided

into Western Himalayas (or Kashmir Himalayas), Central Himalayas (or Kumaun Himalayas) and Eastern Himalayas (or Assam Himalayas).

### **The Coastal Plains:**

They are divided into eastern and western coastal plains. The eastern coast borders the Bay of Bengal. It has formed as a result of depositional work of rivers. The east flowing rivers from all parts of the country empty in the Bay of Bengal on the east coast. Since the slope of the land is gentle, rivers flow at lower velocities and deposit the sediments brought with them at the coast. As a result, deltas are found along this coast. It is therefore difficult for ships to reach the East coast thus indicating less likely conditions favorable for establishment of natural ports.

### **The North Indian Plains:**

The North Indian Plains are divided into two parts. The part lying to the east of the Aravalis is the basin of the river Ganga and is therefore known as the Ganga Plains. It slopes eastward. The western part of the North Indian Plains is occupied by desert, known as Thar Desert or Marusthali. Most of Rajasthan is occupied by this desert.

The plains of Punjab lie to the north of the Thar desert. This region is spread to the west of Aravalis and Delhi ranges which have formed as a result of the depositional work by river Sutlej and its tributaries. The slope of the plains is towards the west.

## Intext Questions

### 1. Question

On the basis of Fig 3.1, answer the following questions:

- (i) In which direction do the Aravalis lie?
- (ii) Aravali ranges act as a water divide between which rivers?
- (iii) Name the hills located on the plateaus to the east of Aravalis.
- (iv) Across which states has the Deccan Plateau spread?
- (v) Which hill ranges lie to the west of the Deccan Plateau?
- (vi) Enumerate the characteristics of the Western Ghats.
- (vii) Compare the Eastern and the Western Ghats.
- (viii) Why are the Western Ghats called a water divide?

**Answer**

- (i) The Aravallis lie in the northwestern direction.
- (ii) The Aravallis act as a water divide between the Narmada and Ganga rivers.
- (iii) **The hills located on the plateau to the east of Aravalis are Rajasthan Alwar range.**
- (iv) The Deccan plateau is spread across the states of Telangana, Maharashtra, Tamil Nadu, Karnataka, Kerala and Andhra Pradesh.
- (v) The Vindhya hills lie to the west of the Deccan Plateau.
- (vi) The characteristics of the Western Ghats are-
  - a. They rise steeply from the west coast, and originate from the Tapi river, till Kanyakumari.
  - b. They are higher than the Eastern Ghats, and have an average height of 900 to 1100 m, the highest peak being Anai Mudi.
  - c. The hills are continuous with an average width of 50 to 80 metres.
  - d. Many important rivers of the Deccan plateau originate from these ghats.
  - e. They lie perpendicular to the southwest monsoon winds, causing heavy rainfall on their windward side.
- (vii)



EASTERN GHATS	WESTERN GHATS
The mark the eastern edge of the Deccan plateau.	They mark the western edge of the Deccan plateau.
They are broad.	They are very narrow.
They receive less rainfall.	They receive more rainfall.
They are discontinuous and irregular.	They are continuous and regular, hence they possess higher elevation.
The highest peak is Mahendra Giri.	The highest peaks are Anai Mudi and Dodda beta.

(viii) The western ghats are the highest boundary line of many Peninsula and Konkan rivers. It divides basins of the east-flowing Peninsular river from those of Konkan and Malabar river which are west flowing rivers. Hence, western ghats are major water divides of peninsular India.