

# 3

## GEOGRAPHY

# Drainage

Contemporary India - I

(NCERT Book)



*Drainage is the process by which a liquid typically water flows from clearly marked and constructed channels. It can also be defined as the process of removing surface and subsurface water from an area that has too much water, either naturally or artificially. A drainage system is made up of a system of lakes, rivers, pipes, and other water-transporting systems. This chapter provides a wealth of information about India's river drainage systems. It will concentrate on a number of Indian rivers.*

### Topic Notes

- Introduction to Drainage
- Various Drainage Systems in India
- The Himalayan River System
- The Peninsular River System
- Indian Lakes
- Rivers' Role in Economy
- River Pollution

Rivers drain various regions in India— mainly the Himalayas and the Peninsular region. Drainage involves the flow of a liquid (usually, water) from well defined, well laid channels. The drainage basin of a river is influenced by the climate of the region, topography and the soil found in the region.

This chapter focuses upon the natural drainage systems created by streams, tributaries and large rivers in India. Differences between various rivers based on their location and their courses have also been underlined in the chapter. Other topics discussed in the chapter are the role and significance of rivers, lakes and other water bodies including defining the river pollution and its impact.

## TOPIC 1

### INTRODUCTION TO DRAINAGE

#### Learning Objectives

- Students will learn about drainage and rivers.
- Students will be introduced to the term-river systems.
- Students will learn about the concept of water divide.

#### Learning Outcomes

- Students will be able to write the definition of a river.
- Students will be able to recall and describe what is drainage.
- Students will be able to learn the meaning of various terms like drains, water divide, basin, upland.

Drainage refers to the flow of any liquid (for example water) through well-defined channels.

A river is made up of various small and large streams which merge together. After these streams merge into the main river, the latter runs its course and finally drains into an ocean, sea or even a lake at times.

A drainage basin refers to the entire area drained by a river and its streams (together called a river system) in the course. When rain falls on a mountain or upland it drains onto both sides of the elevated feature. When a mountain or an upland separates two drainage basins, it is known as a water divide.

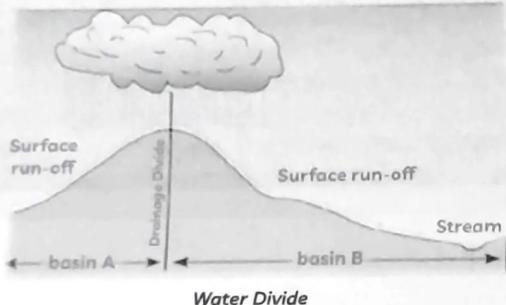


#### Frequently Asked

→ The Ganga Basin is the largest river basin in India. Its river basin is 808334.44 sq. km. Other major river basins with catchment area more than 1.0 lakh km<sup>2</sup> are Indus, Mahanadi, Godavari and Krishna.

**Example 1.** Which river has the largest drainage basin in the world? Where it is located and what is its length? Briefly explain. (Understand) [NCERT]

**Ans.** The Amazon river delta is the largest in the world. It is located in South America. Along with its tributaries, the river spans over an area of around 7 million square kilometres. It spans across Brazil, Peru and Colombia.



## TOPIC 2

### VARIOUS DRAINAGE SYSTEMS IN INDIA

#### Learning Objectives

- Students will learn about rivers located in India.
- Students will be introduced to the concept of river systems. They will mainly be introduced to the two major river systems located in India.

- Students will learn about some differences between various rivers based on their origin and location.
- Students will learn about various geographical features made by the rivers during their course.

## Learning Outcomes

- Students will be able to learn about various river systems.
- Students will be able to enlist differences between the rivers included in these river systems.
- Students will be able to classify some rivers into these systems based on their location.
- Students will be able to identify some geographical features created by rivers.
- Students will be able to understand the meaning of various new geographical terms.

The drainage systems of India are majorly influenced by its broad relief features. There are majorly two systems of rivers in India:

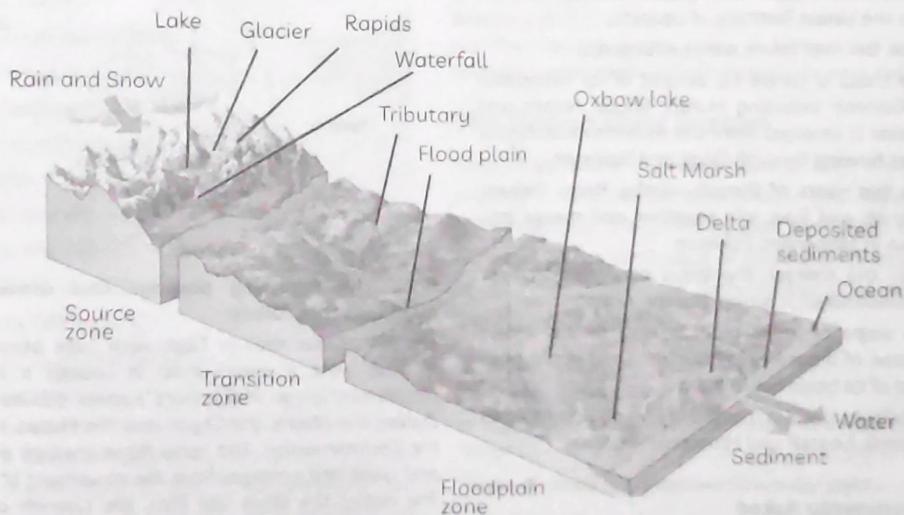
- (1) Himalayan Rivers
- (2) Peninsular Rivers

This classification is not based only on the basis of their point of origination or the direction of their course. Apart from their source of origin, there are several other points of differences between the Himalayan and Peninsular Rivers.

### The Himalayan Rivers

The Himalayan rivers are perennial. They have water throughout the year. They receive water from the rain and from the melted snow from the snow covered mountains and glaciers. Some major examples of the Himalayan rivers are:

The various features that the rivers make throughout their course from source to sea are shown in the diagram below.



*Features made by rivers during different courses*

### The Peninsular Rivers

A large number of Peninsular Rivers are seasonal. They are dependent on rainfall for flow. During dry season, they have a reduced flow. They get dry and lose most of their water.

The course of Peninsular rivers, unlike Himalayan rivers, is shorter and shallower. Most of the Peninsular rivers flow eastwards into Bay of Bengal except a few that flow westwards and drain into Arabian Sea. Peninsular rivers originate in Central Highlands. Narmada and Tapi rivers are some examples.

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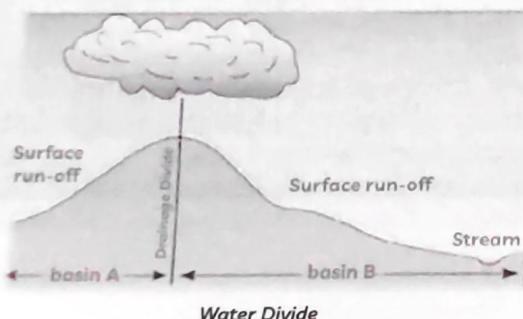


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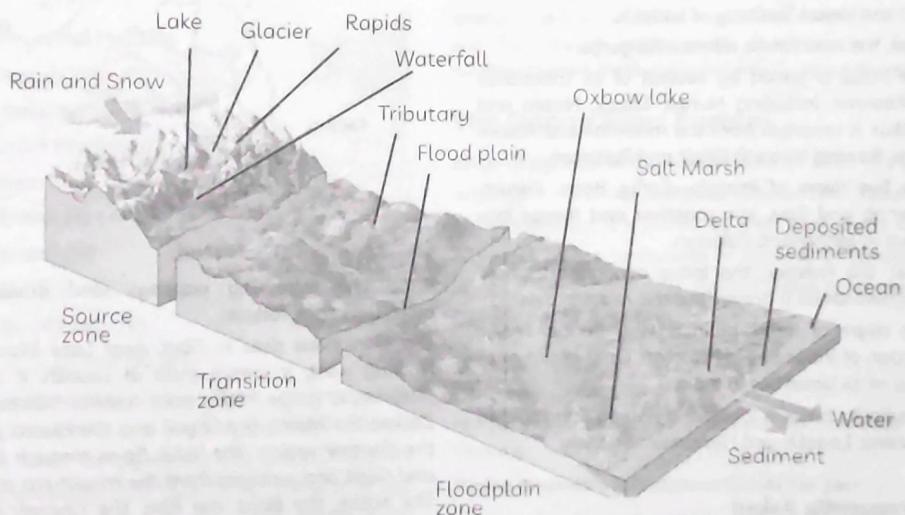
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**Features made by rivers during different courses**

### The Peninsular Rivers

A large number of Peninsular Rivers are seasonal. They are dependent on rainfall for flow. During dry season, they have a reduced flow. They get dry and lose most of their water.

(1) River Brahmaputra originates in the north of Himalayas from Kailash Ranges.

(2) River Indus originates from Mansarovar Lake in Tibet north of Himalayas. They cut through the mighty Himalayas and make beautiful gorges.

The Himalayan rivers flow through a long course before draining into the Bay of Bengal or the Arabian Sea. They undertake significant erosional activity in their upper courses and carry enormous loads of sediments, sand and silt because they are very energetic. Depositional features dominate in the middle and the lower courses of rivers. In this part of the courses, they form ox-bow lakes, meanders and other depositional features. Many of them also form deltas in their lower courses.

The course of Peninsular rivers, unlike Himalayan rivers, is shorter and shallower. Most of the Peninsular rivers flow eastwards into Bay of Bengal except a few that flow westwards and drain into Arabian Sea. Peninsular rivers originate in Central Highlands. Narmada and Tapi rivers are some examples.

## TOPIC 3

# THE HIMALAYAN RIVER SYSTEM

### Learning Objectives

- Students will learn about the Himalayan river system.
- Students will be introduced to the constituent rivers of this system.
- Students will learn about their features, origin and their courses.
- Students will learn to locate these rivers and their courses on the map of India.
- Students will also learn about their drainage system and important functions played by these rivers in their catchment.

### Learning Outcomes

- Students will be able to learn about various Himalayan rivers.
- Students will be able to enlist these rivers, their sources and the direction of their flow.
- Students will be able to classify them into east and west flowing rivers.
- Students will be able to mark their location on the map of India.
- Students will be able to trace their courses and their catchments on the map of India.

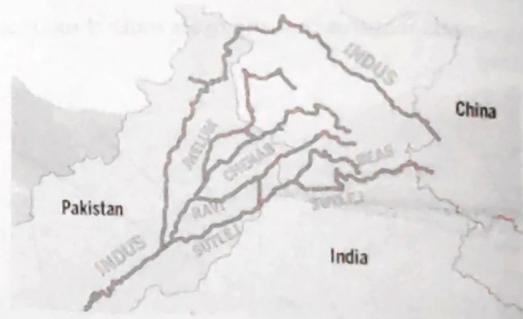
Indus, Ganga and Brahmaputra are the three major rivers of the Himalayan river system. These rivers have long courses and are joined by many minor and major tributaries.

of the river Indus which drains both the countries. India was allocated only 20 percent of the total water carried by the Indus river system.

The water obtained from this agreement is used for irrigation in Punjab, Haryana and the southern and the western parts of Rajasthan.

### The Indus River System

- (1) The Indus River rises from Mansarovar in Tibet. From here, it flows westwards and enters India into the Union Territory of Ladakh.
- (2) Here, the river forms a beautiful gorge.
- (3) The Indus is joined by several of its tributaries in Kashmir including Hunza, Shyok, Nubra and Zaskar. It emerges from the mountains at Attock after flowing through Gilgit and Baltistan.
- (4) The five rivers of Punjab—Satluj, Beas, Jhelum, Chenab and Ravi, join together and merge into Indus in Mithankot, Pakistan.
- (5) After the merger, the Indus continues to flow southwards till it drains into the Arabian Sea.
- (6) The slope of Indus plain is very gentle. Major portion of Indus lies in Pakistan. Only about one-third of its basin lies in India.
- (7) In India, its basin is located in Punjab, Jammu and Kashmir, Ladakh and Himachal Pradesh.



### Example 2. Case Based:

Read the following passage and answer the questions that follow.

The river Indus rises in Tibet, near Lake Mansarovar. Flowing west, it enters India in Ladakh. It forms a picturesque gorge in this part. Several tributaries, the Zaskar, the Nubra, the Shyok and the Hunza, join it in the Kashmir region. The Indus flows through Baltistan and Gilgit and emerges from the mountains at Attock. The Satluj, the Beas, the Ravi, the Chenab and the Jhelum join together to enter the Indus near Mithankot in Pakistan. Beyond this, the Indus flows southwards eventually reaching the Arabian Sea, east of Karachi. The Indus plain has a very gentle slope. With a total length of 2900 km, the Indus is one of the longest rivers of the world. A little over a third of the Indus basin is located in India. Ladakh, Jammu and Kashmir, Himachal Pradesh and Punjab and the rest is in Pakistan.



### Frequently Asked

- A gorge refers to a narrow valley between hills or mountains, typically with steep rocky walls and a stream running through it.

### Important

- The Indus Water Treaty was brokered by the World Bank and signed by India and Pakistan in 1960. The treaty provides for a peaceful sharing arrangement of the waters

(A) Identify which of the following countries share the Indus basin between/among them.

- (I) China                    (II) Afghanistan  
(III) India                    (IV) Nepal

Options:

- (a) (I) and (III) only  
(b) (I), (III) and (IV) only  
(c) (I), (II) and (III) only  
(d) (II) and (IV) only                    (Remember)

(B) Name four interboundary tributaries of River Indus.                    (Remember)

(C) Highlight two features of the Indus Water Treaty.                    (Understand)

(D) Assertion (A): The river Indus rises in Tibet, near Lake Mansarovar.

Reason (R): It drains into the Arabian Sea ending its course in India.

- (a) Both (A) and (R) are true and (R) is the correct explanation of (A).  
(b) Both (A) and (R) are true but (R) is not the correct explanation of (A).  
(c) (A) is correct but (R) is wrong.  
(d) (A) is wrong but (R) is correct.                    (Analyse)

(E) Which of these states are drained by the Indus river?

- (I) Himachal Pradesh  
(II) Punjab  
(III) Haryana  
(IV) Uttar Pradesh

Options:

- (a) (I) and (II)  
(b) (I) and (III)  
(c) (I), (II), and (III) only  
(d) (II), (III) and (IV)                    (Remember)

**Ans. (A) (c) (I), (II) and (III) only**

**Explanation:** Indus River originates in Tibet, China and from there, it enters India. It flows through India and enters Pakistan. Meanwhile, it is also fed by tributaries like river Kabul and Kurram from Afghanistan. It flows southwards in Pakistan from there and finally drains into Arabian Sea.

(B) Four interboundary tributaries of the river Indus are:

- (1) Chenab  
(2) Jhelum

(3) Sutlej

(4) Ravi

(C) Two features of the Indus Water Treaty are:

- (1) It was brokered by the World Bank in 1960.  
(2) It gave India a right over 20% of Indus' waters.

(D) (c) (A) is correct but (R) is wrong.

**Explanation:** The river drains into the Arabian sea but it does not do so when it is flowing in India. It does so, ending its course in Pakistan. In India, the final step in its course is the turn which changes the direction of its flow from east-west to north-south-west.

(E) (c) (I), (II), and (III)

**Explanation:** Himachal Pradesh, Punjab and Haryana are located nearer the Indus river basin and they share its water. Uttar Pradesh is located further east, towards north-central India and away from the Indus river basin.

### Caution

→ It is important for the students to note the course of the rivers mentioned in the chapter on the map of India to answer such questions. Every river meanders and changes directions quickly during its course. This causes it to touch and flow through various states. It is important for the students to mark these states individually for each river.

## The Ganga River System

River Bhagirathi is the headwaters of River Ganga. It originates from the Gangotri Glacier near Gaumukh in Uttarakhand. It is joined by river Alaknanda which originates at the confluence of Satopanth glacier and Bhagirathi Kharak glacier. Both of these rivers meet at Devprayag to form Ganga.

### Mnemonics

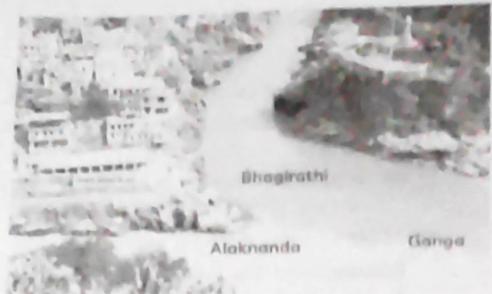
→ The trick to remember all left bank tributaries of River Ganga is:

**"Rama Ghumati hui Ghaghara Ganda Kar Mat".**

Accordingly the left bank tributaries of Ganga are Ramganga, Gomati, Ghaghara, Gandak, Kosi and Mahananda.

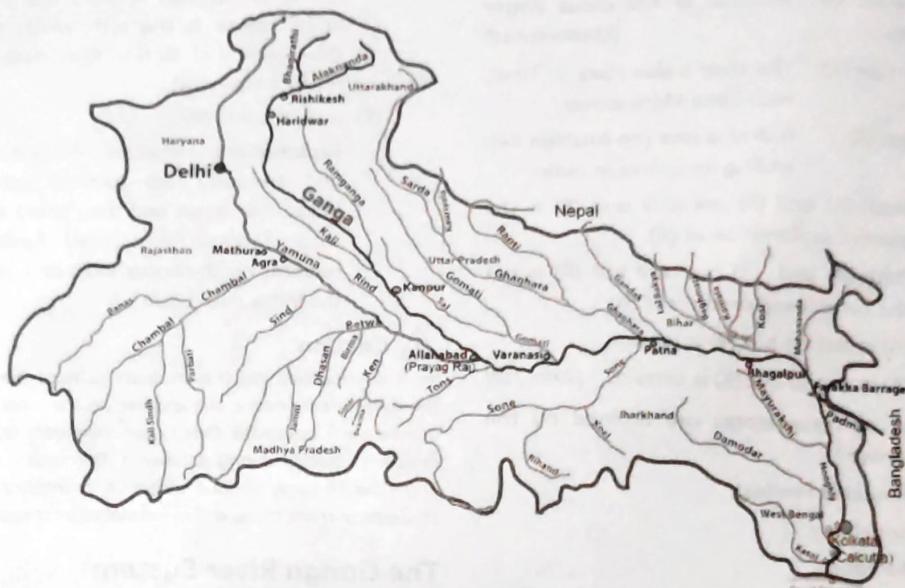
Similarly, the trick to remember right bank tributaries of River Ganga is: "YaSoDa".

Accordingly the right bank tributaries of Ganga are Yamuna, Son and Damodar Rivers.



Alaknanda and Bhagirathi meeting at Devprayag to form Ganga

The Ganga is joined by numerous tributaries originating from the Himalayas. A few such rivers are Kosi, Gandak, Ghaghara and Yamuna. Yamuna is a right bank tributary of Ganga and it rises from Yamunotri glacier in Himalayas. It flows parallel to Ganga for a while and finally merges into it at Allahabad. The Ghaghara, the Gandak and the Kosi are left bank tributaries of Ganga and originate from the Nepal Himalayas. These rivers flood the Northern Plains annually causing damage to life and property but also enriching the soil of these plains at the same time.



Ganga and its tributaries



### Frequently Asked

→ River Ganga is worshipped by a lot of people in north India. Uttarakhand High Court has declared Ganga and Yamuna as living entities.

All tributaries of Ganga do not originate in the Himalayas. Many of them like Son, Betwa and Chambal originate from the Peninsular upland. These carry less water and shorter courses. They join Yamuna which finally joins Ganga.

Ganga flows eastwards through the plains till Farakka in West Bengal. This point marks the northernmost point of the Ganga delta.

From this point, the river bifurcates into two:

(1) The Bhagirathi-Hooghly, the distributary stream, flows southwards through the deltaic plains to the Bay of Bengal.

(2) The mainstream flows southwards into Bangladesh and is joined by the Brahmaputra.

In Bangladesh, which the river reaches even further downstream, it is known as the Meghna.

This river, with waters from the Ganga and the Brahmaputra, flows into the Bay of Bengal. Meghna forms a massive and fertile feature, the Sundarban Delta at its mouth.

**Example 3.** Which is world's largest and fastest growing delta and where is it located? Explain briefly which river fed it. (Understand) [NCERT]

**Ans.** The Sundarban Delta is the world's largest and fastest growing delta. It stretches from Indian state of West Bengal to Bangladesh. Most part of this delta lies in Bangladesh.

The delta is fed by three rivers namely Ganga, Brahmaputra and Meghna.

### Related Theory

The Sundarban Delta derived its name from the Sundari tree, which grows well in marshland. It is also the home of the Royal Bengal Tiger.

### Important

The Namami Gange Programme is an Integrated Conservation Mission approved as a 'flagship programme' by the Union Government in June 2014 to accomplish conservation and rejuvenation of the national river, Ganga.

The Ganga river flows for over 2500 km. It forms the dendritic drainage pattern. Haryana's north eastern district of Ambala is situated exactly at the water divide between the Ganga and the Indus river systems. The plains from Ambala to the Sundarban stretch over nearly 1800 km but only register a gentle fall in slope. There is a fall of just one metre for every 6 km or a total of 300 metres. Thus, the river develops large meanders.

### Important

A river mouth is where a river flows into a larger body of water, such as another river, a lake/reservoir, a bay/gulf, a sea, or an ocean.

## The Brahmaputra River System

A large part of the course of Brahmaputra lies in China. It is somewhat longer than the course of Indus. In the north of Himalayas, it flows eastwards from its source to Namcha Barwa in the north of Arunachal Pradesh. It flows parallel to the Himalayas. From here it takes a U turn and enters Arunachal Pradesh after making a gorge.

Here, the river is called the Dihang. On its course from here onwards, it is joined by the Dibang, the Lohit, and many other tributaries. In Assam, all these rivers together finally form the Brahmaputra.

This river carries lesser water and silt during its course in Tibet because the area is cold and dry. However in India, the region of its catchment in Assam receives a lot of rainfall and the river flows with immense water and good amount of silt.

The Brahmaputra forms various braided channels and riverine islands due to its load during its course in Assam. Every year during the rainy season, the river overflows its banks, causing floods and devastation in Assam and Bangladesh.

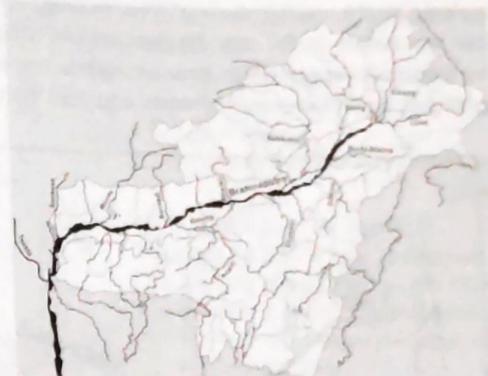


### Frequently Asked

Braided channels are often formed by those rivers that carry a lot of sedimentary load.

### Important

River Brahmaputra forms the largest riverine island in the world—the Majuli Island in Assam. River Brahmaputra possesses huge deposits of silt on its bed causing its riverbed to rise. This distinguishes it from its other north-Indian rivers which do not carry as much silt. The river also shifts its channel frequently. This causes it to create a lot more devastation in the wake of its overflow.



Brahmaputra Basin in India

**Example 4.** Mention one geographical feature made by River Brahmaputra. (Understand)

**Ans.** River Brahmaputra makes a gorge before entering India from Arunachal Pradesh.



### Related Theory

Rivers make Gorges in their upper courses because of their high speeds.

## TOPIC 4

# THE PENINSULAR RIVER SYSTEM

### Learning Objectives

- Students will learn more about the Peninsular river system.
- Students will be introduced to various east and west-flowing peninsular rivers.
- Students will learn about their features, origin and their courses.
- Students will be introduced to other important rivers in India.
- Students will learn to locate these rivers and their courses on the map of India.
- Students will also learn about their drainage and important functions played by these rivers in their catchment.

## Learning Outcomes

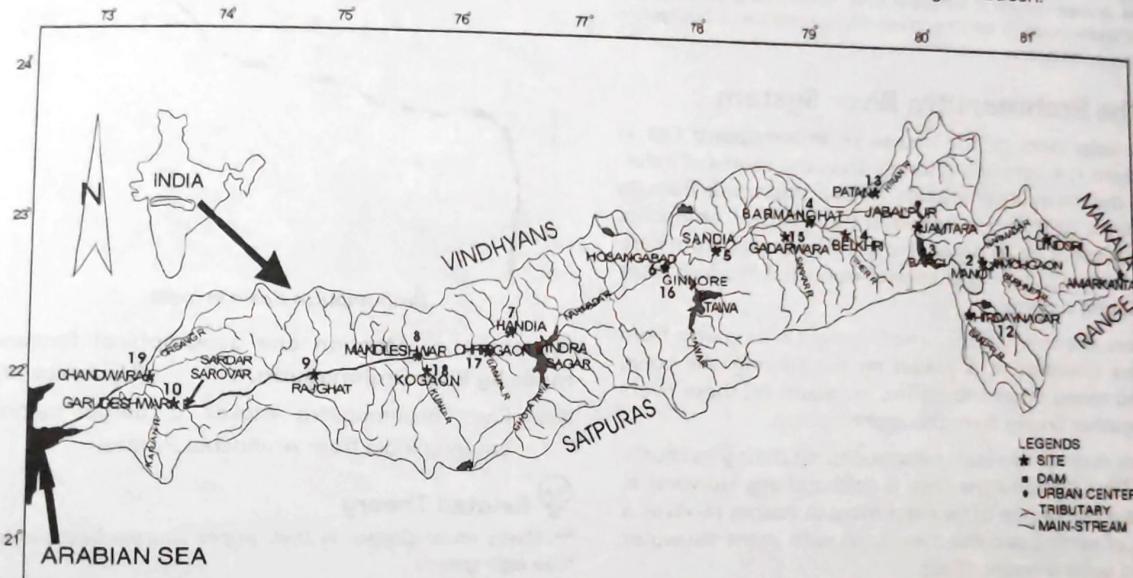
- Students will be able to know about various Peninsular rivers.
- Students will be able to enlist these rivers, their sources and the direction of their flow.
- Students will be able to classify them into east and west flowing rivers. Students will also be able to distinguish their features from the Himalayan rivers.
- Students will be able to mark their location on the map of India.

Western Ghats form as the major water divide for peninsular rivers. They run from north to south along the Western Coast. Most of the rivers of Peninsular India such as the Krishna, the Kaveri, the Godavari and the Mahanadi originate in Western Ghats and flow eastwards and finally drain into the Bay of Bengal. Most of these east flowing rivers form deltas at their mouths before draining into the sea. Many rivers originate on the western slope of Western Ghats and flow westwards to fall into the Arabian Sea. Only two peninsular rivers which flow westwards are of significant size. These are Narmada and Tapi. Both

of these rivers make estuaries on the Western Coast. Peninsular rivers have comparatively small drainage basins when compared to Himalayan rivers.

### The Narmada Basin

Narmada originates in Central India in the Amarkantak Hills. It flows westwards through a rift valley which was formed due to faulting. During its course, Narmada is joined by mostly short tributaries and most of them join Narmada at right angles. Its basin covers Gujarat and Madhya Pradesh.



**Narmada River Basin**

On its way, Narmada facilitates various scenic views which attracts many tourists every year. Some of these picturesque locations are:

- (1) The 'Marble rocks', near Jabalpur, where it flows through a deep gorge.
- (2) The 'Dhuadhar falls', where the river plunges over steep rocks.

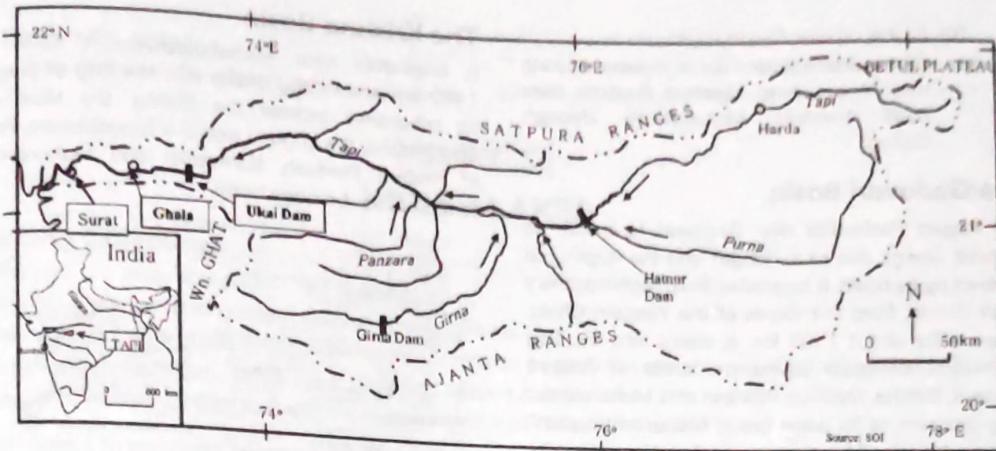
#### Important

- The Narmada river conservation mission has been undertaken by the government of Madhya Pradesh by a scheme named Namami Devi Narmade.

### The Tapi Basin

River Tapi originates from the Satpura ranges located in Betul in Madhya Pradesh. It flows south of Satpura ranges parallel to Narmada in a rift valley. Its course is shorter. Parts of Maharashtra, Gujarat and Madhya Pradesh constitute its basin.

There is a narrow coastal plain between Western Ghats and Arabian Sea. Thus, these rivers have a very short course. Some examples include Mahi, Periyar, Bharathpuzha and Sabarmati.



### Example 5. Case Based:

Read the following passage and answer the questions that follow.

The Tapi rises in the Satpura ranges, in the Betul district of Madhya Pradesh. It also flows in a rift valley parallel to the Narmada but it is much shorter in length. Its basin covers parts of Madhya Pradesh, Gujarat and Maharashtra. The coastal plains between Western Ghats and the Arabian Sea are very narrow. Hence, the coastal rivers are short. The main west flowing rivers are Sabarmati, Mahi, Bharathpuzha and Periyar.

(A) Assertion (A): Tapi is an important river in the Himalayan river system.  
Reason (R): It drains into the Arabian Sea.

- (a) Both (A) and (R) are true and (R) is the correct explanation of (A).
- (b) Both (A) and (R) are true but (R) is not the correct explanation of (A).
- (c) (A) is correct but (R) is wrong.
- (d) (A) is wrong but (R) is correct. (Analyse)

(B) Identify the states which constitute the catchment area of River Tapi.

- (I) Gujarat
- (II) Maharashtra
- (III) Rajasthan
- (IV) Madhya Pradesh

Options:

- (a) (I) and (II) only
- (b) (I), (II) and (III) only
- (c) (II), (III) and (IV) only
- (d) (I), (II) and (IV) only (Remember)

(C) Another river which flows close to Tapi is known as its twin. Mention the name of this river. (Remember)

(D) How is river Tapi significant to the citizens of its catchment area? Highlight two points. (Understand)

- (E) Which of the following statements is NOT true about Tapi?
- (a) It is an east flowing river.
  - (b) It rises from a mountain.
  - (c) It is a short river.
  - (d) It touches the state of Maharashtra.

(Analyse)

Ans. (A) (d) (A) is wrong but (R) is correct.

**Explanation:** Tapi is one of the two major west-flowing rivers found in the Peninsular river system. It is not a Himalayan river. It rises in the Satpura hills in Madhya Pradesh.

(B) (d) (I), (II) and (IV) only

**Explanation:** River Tapi rises from Satpura Ranges in Madhya Pradesh. It flows through northern Maharashtra and enters into Gujarat. It finally drains into Arabian Sea through the Gulf of Cambay without touching Rajasthan.

(C) River Narmada is known as the twin of River Tapi. The course of river Narmada is longer but it flows parallel and to the north of River Tapi.

(D) Two significant roles played by river Tapi for the people in its catchment area are:

- (1) It provides the tribal communities living in the region with water for their irrigation and consumption.
- (2) It also provides a means of transportation for the people living on its banks.

#### Caution

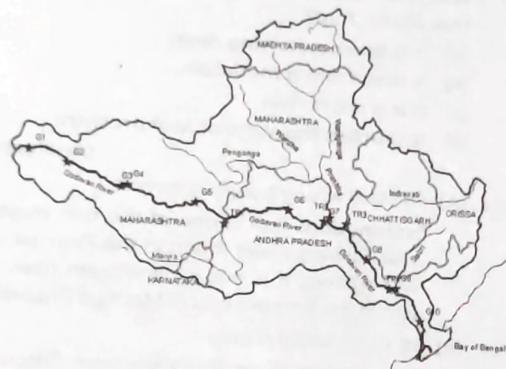
It is important for the students to apply the general information learned by them in specific situations by tailoring it accordingly. Rivers perform similar functions for almost every person. River Tapi is no different. Students can tailor main functions of rivers according to the question.

(E) (a) It is an east flowing river.

**Explanation:** River Tapi is a west flowing river. Arises from Madhya Pradesh then flows towards Maharashtra through Gujarat.

### The Godavari Basin

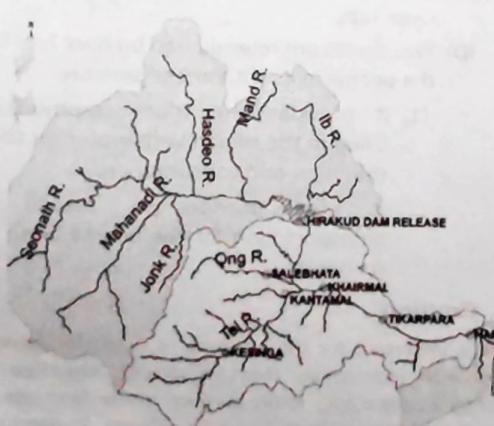
The largest Peninsular river Godavari, is known as Dakshin Ganga due to its length and the huge area covered by its basin. It originates from Maharashtra's Nasik district from the slopes of the Western Ghats. It spans for about 1500 km. It drains into the Bay of Bengal. Its basin covers the areas of Andhra Pradesh, Odisha, Madhya Pradesh and Maharashtra. Fifty per cent of its basin lies in Maharashtra itself. Godavari is joined by numerous tributaries during its course including the Penganga, the Wainganga, the Manjra, the Pranhita, the Wardha and the Purna.



The Godavari Basin

### The Mahanadi Basin

The Mahanadi river rises from the Sihawa mountains in Chhattisgarh. It reaches Bay of Bengal after flowing through Odisha. Its length is 860 km. Parts of Jharkhand, Chhattisgarh, Maharashtra and Odisha constitute its basin.



Mahanadi River Basin

### The Krishna Basin

It originates near Mahabaleshwar. It flows for 1400 km and finally drains into the Bay of Bengal. Its tributaries include the Bhima, the Musi, the Ghatprabha, the Koyana and the Tungabhadra. Parts of Andhra Pradesh, Karnataka and Maharashtra constitute its drainage basin.



The Krishna Basin

### The Kaveri Basin

The Brahmagiri Hills in Western Ghats are the source of Kaveri river. It drains into the Bay of Bengal after flowing through Cuddalore in central Tamil Nadu. It spans for 760 km. Kabini, Hemavati, Bhavani and Amravati are its major tributaries. Parts of Tamil Nadu, Kerala and Karnataka constitute its basin.



The Kaveri Basin

#### Important

→ River Kaveri makes the second biggest waterfall in India, known as Shivasamudram Falls. The hydroelectric power generated from the falls is supplied to Mysore, Bengaluru and the Kolar Gold Field.

→ Kunchikal falls in Karnataka is the biggest waterfalls in India.

Some other East-flowing rivers are the Damoder, the Brahmani, the Baitarni and the Subarnrekha.



## Frequently Asked

- 71 per cent of the world's surface is covered with water.

but 97 per cent of that is salt water.  
Of the 3 per cent that is available as freshwater, three quarters of it is trapped as ice.

## TOPIC 5 INDIAN LAKES

### Learning Objectives

- Students will learn about lakes and their functions.
- Students will understand about different types of lakes.
- Students will learn about different functions performed by the lakes and their significance to human life.
- Students will be introduced to a few important lakes in India.
- Students will learn about different processes which lead to the formation of lakes.

### Learning Outcomes

- Students will be able to learn about the functions performed by the lakes.
- Students will be able to enlist the different processes of lake formation.
- Students will be able to mark a few lakes mentioned in the topic on the map of India.

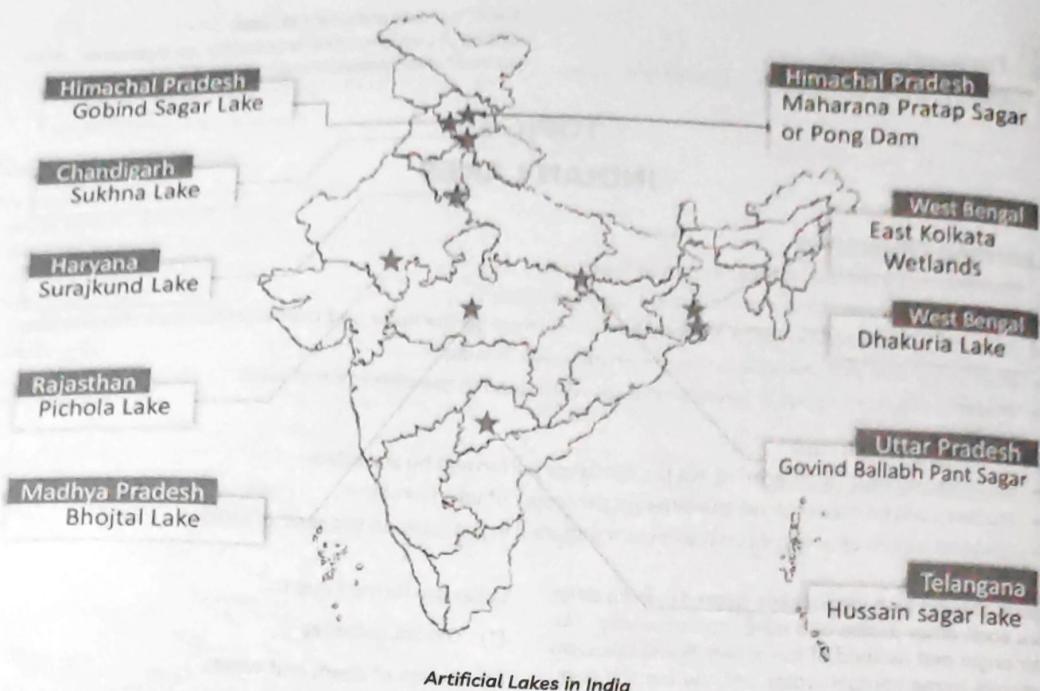
India is abound with lakes. Lakes located in India differ from each other in size and other characteristics like their origin and method of formation. Some lakes are perennial, some contain water only during the rainy season, like the lakes in the basins of inland drainage of semi-arid regions.

Lakes are formed due to:

- (1) Glacial activities
- (2) Action of rivers and winds
- (3) Artificial construction by man



Largest Lakes in India



Artificial Lakes in India



### Frequently Asked

→ Large lakes are called seas. Some examples are, the Caspian Sea, the Dead Sea and the Aral Sea. The Caspian Sea is the world's largest inland body of water.

When a river meanders, it forms cut-offs which later develop into ox-bow lakes. In coastal regions, spits and bars are formed which give rise to lagoons. Examples include the Kolleru lake, the Pulicat lake and the Chilika lake. Unlike these lakes, the lakes found in inland drainage are often seasonal. Sambhar Lake in Rajasthan is one such seasonal lake. This lake is a saltwater lake and is used for manufacturing salt.

Lakes of Himalayan region are mostly freshwater lakes. Glacial lakes are formed when a basin which was dug out by the glacier itself is filled with snowmelt.

Some lakes are a result of tectonic activity. For example, the Wular lake in Kashmir. In India, The Wular lake is the largest freshwater lake. Other major freshwater lakes include Barapani, Loktak, Nainital, Bhimtal and Dal lake.

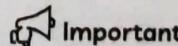
Damming of the rivers for the generation of hydel power has also led to the formation of lakes, such as Guru Gobind Sagar Lake (built because of the Bhakra Nangal Project).



Wular Lake

Lakes provide great economical and ecological value to humans. They also facilitate the following:

- (1) Lakes help recharge groundwater.
- (2) Lakes provide water in stressful times and also prevent flooding in times of excessive rainfall.
- (3) Lakes also moderate the temperature and hence weather of their surroundings.
- (4) They help aquatic ecosystem flourish.
- (5) A lot of national and international tourists throng to view lakes each year. Wular Lake in Kashmir is a major attraction for tourists.
- (6) Lakes provide activities like swimming, boating and other gaming activities.



→ The valley of Kashmir and the famous Dal Lake attract thousands of tourists every year from all over the world. Shikaras and the house boats are popular modes of transportation on the lake.

## TOPIC 6

# RIVERS' ROLE IN ECONOMY

### Learning Objectives

- Students will learn about the role of rivers in the Indian economy.
- Students will understand about the significance of rivers.
- Students will be introduced to terms like water-stricken, hydro-power generation, etc.

### Learning Outcomes

- Students will be able to learn about the functions played by rivers.
- Students will be able to enlist these functions and add a few of their own to this list.
- Students will be able to define river tourism.

Like Indus Valley Civilisation, a lot of civilisations have developed at banks of a river in the past. Rivers have always been of significance to human needs.

- (1) Rivers provide water for various human activities. Groundwater is not available at all places and rivers provide water in various water-stricken areas.
- (2) Rivers also facilitate irrigation, hydro-power generation and transportation of people and goods.
- (3) Rivers also help various groups and communities earn their livelihood. They also form a reliable means of transportation.
- (4) The presence of rivers in a region helps in maintaining pleasant weather in the region.

### Important

- River tourism includes activities that take place on and around rivers. Such activities include rafting, fishing, cruising, sailing, etc.

**Example 6.** Which of the following is not a function performed by the rivers for human beings?

- (I) Transportation
- (II) Livelihood generation
- (III) Tourism
- (IV) Residential purposes

### Options:

- |                         |                               |
|-------------------------|-------------------------------|
| (a) (I), (II) and (III) | (b) Only (IV)                 |
| (c) (I) and (IV)        | (d) (I), (II), (III) and (IV) |
- (Analyse)*

**Ans.** (b) Only (IV)

**Explanation:** Rivers don't function as residences for humans. They support the life of aquatic flora and fauna. They perform all the other functions for the sustenance of human life.

## TOPIC 7

# RIVER POLLUTION

### Learning Objectives

- Students will learn about water and river pollution.
- Students will be introduced to various factors which affect the quality and quantity of water resources and bodies.
- Students will learn about the significance of water for human survival.

### Learning Outcomes

- Students will be able to learn about some action plans undertaken by the government to save rivers.
- Students will be able to define river pollution and enlist its causes.
- Students will be able to define water scarcity and underline its primary cause.
- Students will be able to enlist the names of a few action plans launched by the government.

Rivers are exploited by humans for various purposes. They are utilised more than they can in an ecologically resilient manner. River water is used by humans for different purposes including agriculture, domestic consumption and for industrial usage by municipalities.

Burgeoning demand for water naturally affects the quality of its available resources. More water is being drained out of the rivers than is being pumped in or accumulated, reducing their volume. This causes severe water stress.

Another similar issue associated with rivers is their pollution. Mixing of foreign substances (due to anthropogenic or natural factors) with river water leads to a depletion of its quality. This is called river pollution.

A heavy load of untreated sewage and industrial effluents are emptied into the rivers. This affects the quality and self-cleansing capacity of the river.

### Important

→ The Ganga water is able to dilute and assimilate pollution loads within 20 km of large cities because of its stream flow. Increasing urbanisation and industrialisation prevent this cleansing.

Concern over rising pollution in the rivers forced our government to launch pertinent action plans to clean and save our water resources. This is essential because humans cannot sustain without the supply of fresh water.

The river cleaning programme in the country was initiated with the launching of the Ganga Action Plan (GAP) in 1985 which was expanded to cover other rivers under the National River Conservation Plan (NRCP) in 1995.

**Example 7.** Highlight the main objective of NRCP.  
(Understand)

**Ans.** The main objective of the NRCP is:

- (1) To improve the water quality of the rivers, which are major water sources in the country.
- (2) To implement pollution abatement work and conserve our water resources.



## Glossary

- (1) **Catchment:** A reservoir that collects or catches water
- (2) **Upland:** An area of high or hilly land
- (3) **Basin:** Deep bowl-shaped piece of land that accumulates water or is drained by the same.
- (4) **Water divide:** A high upland that divides the flow of water into two directions
- (5) **Brokered:** Set up, Mediated
- (6) **Headwaters:** Its source; the farthest place in that river or stream from its estuary or downstream confluence with another river
- (7) **Delta:** An area of flat land which is shaped like a triangle; this is where a river divides into smaller rivers as it falls into the sea
- (8) **Distributary:** Branch of a river that does not return to the mainstream after leaving it
- (9) **Tributary:** A stream that flows toward a river and finally merges with it
- (10) **Glacial:** Related to glaciers
- (11) **Spits:** Deposition bar or beach landform off coasts or lake shores
- (12) **Bars:** Deposits of sand and gravel laid down by waves, rivers or currents which separate the shoreline from the sea
- (13) **Lagoons:** A shallow body of water separated from a larger body of water by a narrow landform, such as reefs, barrier islands, barrier peninsulas, or isthmuses
- (14) **Estuaries:** Partially enclosed coastal body of brackish water with one or more rivers or streams flowing into it and a connection to open sea
- (15) **Action plan:** Detailed plan outlining actions needed to reach one or more goals



## Chronology

**1960:** Indus Water Treaty was brokered.

**1985:** The Ganga Action Plan was launched.

**1995:** The Ganga Action Plan was expanded to cover other rivers under the National River Conservation Plan (NRCP).

**2014:** The Namami Gange Programme was approved as a flagship programme of the Indian government.

## OBJECTIVE Type Questions

[ 1 mark ]

### Multiple Choice Questions

1. Manish has spent most of his childhood in the vicinity of Kashmir. Later he moved to Delhi for higher schooling. His class is taught about water divide and given various examples of this structure in the lecture. He is arguing with his friend regarding the joining of river Indus with Jhelum. Identify the location where they meet.

- (a) Baltistan      (b) Gilgit  
(c) Mithankot      (d) Karachi

**Ans.** (c) Mithankot

**Explanation:** The Satluj, the Beas, the Ravi, the Chenab and the Jhelum join together to enter the Indus near Mithankot in Pakistan.

#### Related Theory

→ Many tributaries like the Zaskar, the Nubra, the Shyok and the Hunza, join it in the Kashmir region.

2. Which of the following ways result in the formation of lakes?

- (I) Some formed only during the rainy season.  
(II) Formed by the action of glaciers and ice sheets.  
(III) Formed by wind, river action and human activities.  
(IV) Found only in coastal regions.

**Options:**

- (a) (I) and (II)      (b) (II) and (III)  
(c) (I), (III) and (IV)      (d) (I), (II) and (III)

**Ans.** (d) (I), (II) and (III)

**Explanation:** Most lakes are permanent. Some contain water only during the rainy season, like the lakes in the basins of inland drainage of semi-arid regions. There are some lakes which are the result of the action of glaciers and ice sheets, while others have been formed by wind, river action and human activities.

#### Related Theory

→ Lakes differ from each other in size and other characteristics. Lakes of large extent are called seas, like the Caspian, the Dead and the Aral seas.

3. Which of the following is not a Himalayan river?

- (a) Ganga      (b) Indus  
(c) Tapi      (d) Brahmaputra

**Ans.** (c) Tapi

**Explanation:** Brahmaputra, Ganga and Indus all lie in the Himalayas; Brahmaputra and Indus originate in north of the Himalayan range while Ganga originates further south. However, Tapi does not belong to the Himalayan river system. It belongs to the Peninsular river system.

#### Related Theory

→ River Tapi rises in the Satpura ranges in Madhya Pradesh and flows westwards to drain into the Arabian Sea through the Gulf of Cambay.

4. Why are the Himalayan rivers perennial?

- (a) They receive rainfall throughout the year.  
(b) There is negligible usage of river water in the Northern Plains.  
(c) They receive water from both rainfall and snowmelt from glaciers.  
(d) They have perennial sources in the form of seas.

**Ans.** (c) They receive water from both rainfall and snowmelt from glaciers.

**Explanation:** Himalayas receive majority of their rainfall during southwest monsoon just like the rest of the country. However, it is the melting of snow from glaciers that sustains the Himalayan rivers during the times of no rainfall. Thus, these rivers are perennial. Northern Plains consume a lot of water from these rivers.

5. Arjun is preparing a project on major rivers of India. While researching, he learns that one of India's longest rivers Brahmaputra originates and flows through Tibet, where it is known as Tsangpo, before entering India. Later, it becomes one of the most important rivers of Assam and Arunachal Pradesh, bringing both fertility and devastating floods.

Based on this information, identify from where it enters India.

- (a) Pir Panjal ranges  
(b) Assam  
(c) Arunachal Pradesh  
(d) Ladakh

**Ans.** (c) Arunachal Pradesh

**Explanation:** Brahmaputra originates in Kailash ranges located in the north of Himalayas. It flows eastwards for long and finally takes a U-turn above Arunachal Pradesh to enter into India. Later, it flows through Assam to finally drain into Bay of Bengal.

6. Choose the odd one out.

- |                 |              |
|-----------------|--------------|
| (a) Kaveri      | (b) Krishna  |
| (c) Brahmaputra | (d) Godavari |

**Ans.** (c) Brahmaputra

**Explanation:** Brahmaputra rises in Tibet east of Mansarovar lake in the Himalayas. Therefore, it is a river of Himalayan river system.

### Related Theory

Godavari, Krishna and Kaveri are the rivers of Peninsular river system.

7. Which of the following is not a left bank tributary of Ganga?

- |              |            |
|--------------|------------|
| (a) Gandak   | (b) Yamuna |
| (c) Ghaghara | (d) Kosi   |

**Ans.** (b) Yamuna

**Explanation:** River Yamuna joins Ganga on its right bank. Son and Damodar are other right bank tributaries of Ganga.

### Related Theory

The left bank tributaries of river Ganga are Ramganga, Gomti, Ghaghara, Gandak, Kosi.

### Caution

To remember the left and right bank tributaries of river Ganga, tricks and Mnemonics have been mentioned in the chapter. Students can either learn the same or make their own. These techniques help the students to learn such factoids easily.

8. You are on an expedition to trace the journey of one of the longest rivers in South Asia. This river originates in a region known for its cold, high-altitude plateaus and then flows through India and Pakistan before emptying into the Arabian Sea. Historically, it supported one of the world's oldest civilisations. Identify where does this river originate.

(a) Jammu and Kashmir

(b) Ladakh

(c) Tibet

(d) Uttarakhand

**Ans.** (c) Tibet

**Explanation:** Indus rises from Mansarovar in Tibet. From Mansarovar, it flows westward parallel to Sutlej for some time. It is joined by Punjab's 5 rivers in Pakistan and later it finally drains into the Arabian Sea.

### Related Theory

Only one third of its basin lies in India, rest lies in Pakistan.

9. Which of the following is a cause of river pollution?

- (I) Putting biodegradable waste into the green dustbin.
- (II) Plastics bottles into the river.
- (III) Biomedical waste into the open yards.
- (IV) Smoke coming out of chimneys

Options:

- (a) (I) Only
- (b) (II) Only
- (c) (I), (III) and (IV) Only
- (d) (I) and (II) Only

**Ans.** (b) (II) Only

**Explanation:** River pollution is caused by disposal of the waste generated by humans, both from households and industries, without any treatment into the waterbodies.

### Related Theory

Biomedical waste into the open yards and smoke coming out of chimneys are the causes of land and air pollution.

10. Rashmika, a tourist guide at Uttarakhand, tells her tourists that two head-streams of Ganga joins at this place and Ganga gets its complete form. Name two headstreams of this river which unite at Devprayag.

- (a) Alakananda and Yamuna
- (b) Yamuna and Bhagirathi
- (c) Alakananda and Bhagirathi
- (d) Bhagirathi and Yamuna

**Ans.** (c) Alakananda and Bhagirathi

**Explanation:** The headwaters of the Ganga, called the 'Bhagirathi' are fed by the Gangotri Glacier and joined by the Alaknanda at Devprayag in Uttarakhand.

### Caution

To learn the tributaries of each river, students can employ the use of diagrams or concept maps. This will help them memorise these tributaries and their directions and courses easily.

11. Consider the statements given below and choose the correct answer.

Statement (I): Farakka in West Bengal is the northernmost point of the Ganga delta.

Statement (II): Bhagirathi-Hooghly flows southwards through the deltaic plains to the Bay of Bengal.

- (a) Statement (I) is correct and (II) is incorrect.
- (b) Statement (I) is incorrect and (II) is correct.
- (c) Both (I) and (II) are incorrect.
- (d) Both (I) and (II) are correct.

**Ans.** (d) Both (I) and (II) are correct.

**Explanation:** West Bengal is the northern most point of Ganga and from here its mainstream, flows southwards into Bangladesh and is joined by the Brahmaputra.

- 12. Which of the following is not the tributary of Krishna River?**

- (a) Tungabhadra
- (b) Koyana
- (c) Wainganga
- (d) Bhima

**Ans.** (c) Wainganga

**Explanation:** Tungabhadra, Koyana and Bhima are tributaries of Krishna river. Other important tributaries of the Krishna river are Musi and Ghatprabha. However, Wainganga river is not a tributary of Krishna. It is a tributary of the Godavari river.

### Related Theory

→ Wainganga joins Godavari on its left bank.

- 13. Arrange the following rivers from North to South.**

- |            |             |
|------------|-------------|
| (I) Satluj | (II) Jhelum |
| (III) Ravi | (IV) Beas   |
| (V) Chenab |             |
- Options:
- (a) (I), (II), (IV), (III), (V)
  - (b) (II), (V), (III), (IV), (I)
  - (c) (V), (III), (I), (II), (IV)
  - (d) (I), (V), (III), (IV), (II)

**Ans.** (b) (II), (V), (III), (IV), (I)

**Explanation:** The Sutlej, the Beas, the Ravi, the Chenab and the Jhelum join together to enter the Indus near Mithankot in Pakistan. They are arranged from North to South in this pattern: Jhelum-Chenab-Ravi-Beas and Satluj.

- 14. Choose the incorrectly matched pair.**

- (a) Narmada - Gujarat
- (b) Godavari - Maharashtra
- (c) Kaveri - Andhra Pradesh
- (d) Krishna - Karnataka

**Ans.** (c) Kaveri - Andhra Pradesh

**Explanation:** The Kaveri basin drains parts of Karnataka, Kerala and Tamil Nadu. It doesn't drain any regions of Andhra Pradesh.

- 15. Which lake is formed by the result of tectonic activity?**

- (a) Kolleru lake
- (b) Wular lake
- (c) Chilika lake
- (d) Sambhar lake

**Ans.** (b) Wular lake

**Explanation:** Wular lake is formed by the tectonic activity in Jammu and Kashmir. It is the largest freshwater lake in India.

Sambhar lake is seasonal lake and the producer of common salt.

### Related Theory

→ Chilika and Pulicat lakes are formed as the split from rivers.

- 16. Identify which of the following is not a small river that flows eastwards in peninsular plateau.**

- (a) Subernrekha
- (b) Baitarni
- (c) Brahmani
- (d) Kaveri

**Ans.** (d) Kaveri

**Explanation:** Kaveri is not a small river that flows west to east in peninsular plateau. It is a sizeable river and flows for around 760 km in length.

### Related Theory

→ Subarnrekha, Baitarni and Brahmani are minor rivers that flow eastwards. Another such river is Damodar river.

- 17. Mohit has never visited any of the southern states. Shree was born and brought up in Telangana. He came to her and curiously asked her which of the southern river is known as "Dakshin Ganga". What should be Shree's answer?**

- (a) Krishna river
- (b) Kaveri river
- (c) Godavari river
- (d) Periyar river

**Ans.** (c) Godavari river

**Explanation:** Godavari river is also known as Dakshin Ganga due to its length and the large area its basin covers. It is also the largest peninsular river. It originates from Maharashtra's Nasik district from the Western Ghats. It spans for about 1500 km. Like Ganga it also drains into the Bay of Bengal.

### Related Theory

→ Periyar River is known as "Lifeline of Kerala". It's a small river that originates from Western Ghats.

- 18. Choose the correct tributaries of Ganga.**

- (a) Lohit, Tista and Manas
- (b) Penganga, Wainganga and Purna

- (c) Bhima, Ghatprabha and Koyana
- (d) Kosi, Gandak and Yamuna

**Ans.** (d) Kosi, Gandak and Yamuna

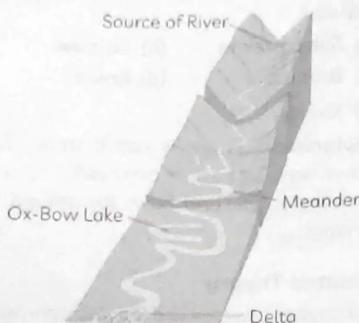
**Explanation:** Kosi, Gandak and Yamuna are the tributaries of river Ganga. Other tributaries of the river include Ghagara, Ramganga, Sarda, Saptkoshi, etc.



### Related Theory

→ Lohit, Tista and Manas are the tributaries of Brahmaputra river. Penganga, Wainganga and Purna are the tributaries of Godavari river while Bhima, Ghatprabha and Koyana are the tributaries of Krishna river.

**19.** Observe the given picture and answer the following questions.



In which course of a river is the oxbow lake formed?

- (a) Upper course
- (b) Lower course
- (c) Middle course
- (d) Mouth of the river

**Ans.** (b) Lower course

**Explanation:** A meandering river across a floodplain forms cut-offs that later develops into oxbow lakes. This is generally formed in the lower course where its speed is very less.

**20.** Which of the following river is known as the lifeline of Madhya Pradesh?

- (a) Brahmaputra
- (b) Narmada
- (c) Krishna
- (d) Ganga

**Ans.** (b) Narmada

**Explanation:** The rest of the rivers do not drain Madhya Pradesh in their courses.

**21.** Choose the correctly matched pair.

- (a) Krishna - Tungabhadra
- (b) Kaveri - Chambal

- (c) Godavari - Ken
- (d) Mahi - Narmada

**Ans.** (a) Krishna - Tungabhadra

**Explanation:** Chambal and Ken are both tributaries of Yamuna river. Mahi has no tributaries.



### Related Theory

→ Tungabhadra, Manjra, Ghatprabha, Bhima and Koyana are the tributaries of Krishna river. Penganga, Majra, Purna, Wainganga, Pranhita and Wardha are the tributaries of Godavari.

**22.** Identify the given features of peninsular rivers.

- (I) Flow of peninsular river is dependent on rainfall and glaciers.
- (II) Rivers of peninsular India arises in the Western Ghats.
- (III) The Narmada and the Tapi are the only long rivers, which flow west and make estuaries.
- (IV) The river Krishna makes the second biggest waterfall in India.

**Options:**

- |                         |                    |
|-------------------------|--------------------|
| (a) Only (IV)           | (b) (II) and (III) |
| (c) (I), (II) and (III) | (d) Only (II)      |

**Ans.** (b) (II) and (III)

**Explanation:** Peninsular rivers are seasonal as they are dependent on rainfall, which is responsible for their flow also.



### Related Theory

→ The Kaveri river makes the second biggest waterfall in India, Shivasamudram falls.

**23.** Identify the river using the given hints:

- (I) It rises from a spring near Mahabaleshwar.
- (II) It reaches the Bay of Bengal.
- (III) The Tungabhadra, the Koyana, the Ghatprabha, the Musi and the Bhima are some of its tributaries.
- (IV) Drainage basin is shared by Maharashtra, Karnataka and Andhra Pradesh.

**Options:**

- |                    |                  |
|--------------------|------------------|
| (a) Krishna River  | (b) Kaveri River |
| (c) Godavari River | (d) Tapi River   |

**Ans.** (a) Krishna River

**Explanation:** The Krishna river rises from Mahabaleshwar and flows eastwards, towards the Bay of Bengal. Its basin is shared by Maharashtra, Karnataka and Andhra Pradesh.



**Ans.** (a) Statement (I) is correct and (II) is incorrect.  
**Explanation:** It is true that peninsular rivers drain into both Arabian Sea as well as Bay of Bengal. However, it is not true that most of the west flowing peninsular rivers make deltas. It is the east flowing peninsular rivers that form deltas.

#### Related Theory

→ The west flowing peninsular rivers form estuaries and not deltas.

**32.** Read the data given below and answer the question.

River	Drainage
Brahmaputra	Bay of Bengal
Godavari	Bay of Bengal

As per the data given above, what is the difference between these two rivers?

- (a) Amount of flow during a particular season.
- (b) One is completely a glacier river
- (c) Help in irrigation
- (d) Physiographic origin

**Ans.** (d) Physiographic origin

**Explanation:** On the basis of their origin or physiographic division, Rivers are divided into two types- Himalayan rivers and Peninsular. As per the above question Brahmaputra is an Himalayan river originating in Tibet and Godavari is an peninsular river originating in Nasik district of Maharashtra.

**33.** Ganga is widely known as a Himalayan river. Identify the correct information regarding River Ganga.

- (I) All tributaries of Ganga originate in Himalayas.
- (II) Headwaters of Ganga are Bhagirathi and Alaknanda.
- (III) Meghna is formed by Ganga and Brahmaputra.
- (IV) Its length is about 860 km.

Options:

- (a) (I) Only
- (b) (I) and (IV) Only
- (c) (II) and (III) Only
- (d) (IV) Only

**Ans.** (c) (II) and (III) Only

**Explanation:** Most of the tributaries of Ganga river originate in Himalayas like Gandak, Ghaghara, Kosi, Ramganga, etc. However, there are other tributaries that do not originate in the Himalayas. Such tributaries are Son, Betwa and Ken. Its total length is about 2500 km.

**34.** Narmada river rises from Amarkantak plateau and on its way to Arabian Sea, it creates .....  

- (a) Shivasamudram Falls
- (b) Dhuandhar Falls
- (c) Dal Lake
- (d) Sundarban Delta

**Ans.** (b) Dhuandhar Falls

**Explanation:** Narmada river during its course creates many picturesque locations like Dhuandhar Falls and Marble rocks in Jabalpur.

#### Related Theory

→ Sundarban Delta is formed by River Ganga and Brahmaputra during its drain into Bay of Bengal.

**35.** Which of the following rivers make estuaries?

- (a) The Ganga
- (b) The Brahmaputra
- (c) The Indus
- (d) Narmada

[Delhi Gov. QB 2024]

**Ans.** (d) Narmada

**Explanation:** River Narmada and Tapi make estuaries.

**36.** Pulicat lake, Kolleru lake and Chilika lake are formed by:

- (a) cut-offs from the river
- (b) melting of glaciers
- (c) result of tectonic activity
- (d) damming of rivers

**Ans.** (a) cut-offs from the river

#### Related Theory

→ Pulicat lake is located on the border of Tamil Nadu and Andhra Pradesh while Chilika lake is located in Odisha. Kolleru lake is located in Andhra Pradesh.

**37.** Why unlike other rivers of north India, river Brahmaputra causes massive devastation during rainy season?

- (a) It does not divide into any tributaries
- (b) Huge amount of silt on their bed
- (c) Amount of water rises very much
- (d) Flow of river

**Ans.** (b) Huge amount of silt on their bed

**Explanation:** Due to excessive amount of silt present, causes the water to overflow and takes the form of flood causing massive devastation.

#### Related Theory

→ The largest river basin in the entire world is the Amazon river basin. It covers an area of around 7 million square kilometres.

**38.** Match the items in Column A with those in Column B.

Column A	Column B
(A) Shivasamudram Falls	(I) Narmada
(B) Marble rocks	(II) Kaveri
(C) Sundarbans Delta	(III) Krishna
(D) Nagarjuna Sagar Lake	(IV) Brahmaputra

Options:

- (a) (A)-(III), (B)-(I), (C)-(IV), (D)-(II)
- (b) (A)-(II), (B)-(I), (C)-(IV), (D)-(III)
- (c) (A)-(II), (B)-(IV), (C)-(I), (D)-(III)
- (d) (A)-(III), (B)-(IV), (C)-(II), (D)-(I)

**Ans.** (b) (A)-(II), (B)-(I), (C)-(IV), (D)-(III)

**Explanation:** Items in column A are geographical features/picturesque locations formed on the rivers given in column B.

**39.** Match the items in Column A with those in Column B.

Column A	Column B
(A) Pulicat Lake	(I) Manipur
(B) Chilika Lake	(II) Kashmir
(C) Loktak Lake	(III) Odisha
(D) Wular Lake	(IV) Andhra Pradesh

Options:

- (a) (A)-(II), (B)-(I), (C)-(IV), (D)-(III)
- (b) (A)-(IV), (B)-(III), (C)-(I), (D)-(II)
- (c) (A)-(IV), (B)-(II), (C)-(I), (D)-(III)
- (d) (A)-(III), (B)-(IV), (C)-(II), (D)-(I)

**Ans.** (b) (A)-(IV), (B)-(III), (C)-(I), (D)-(II)

**40.** Match the items in Column A with those in Column B.

Column A	Column B
(A) Ganga	(I) Amarkantak Hills
(B) Narmada	(II) Nasik
(C) Godavari	(III) Mansarovar Lake
(D) Brahmaputra	(IV) Gangotri

Options:

- (a) (A)-(IV), (B)-(I), (C)-(III), (D)-(II)
- (b) (A)-(II), (B)-(III), (C)-(IV), (D)-(I)
- (c) (A)-(II), (B)-(IV), (C)-(I), (D)-(III)
- (d) (A)-(IV), (B)-(I), (C)-(II), (D)-(III)

**Ans.** (d) (A)-(IV), (B)-(I), (C)-(II), (D)-(III)

**Explanation:** The given rivers originate from the following regions.

**Ganga:** Headwaters emerge from Gangotri Glacier; it becomes Ganga at Devprayag.

**Narmada:** Rises from Amarkantak Hills, drains into the Arabian Sea.

**Godavari:** Rises from Nasik district in Maharashtra.

**Brahmaputra:** Rises in Tibet east of Mansarovar lake very close to the sources of the Indus and the Satluj, joins Ganga to become Meghna in Bangladesh.

#### Related Theory

→ Son rises from the Amarkantak Hills and joins Yamuna as a tributary.

#### Assertion-Reason (A-R)

In the following questions, two statements in the form of an Assertion (A) and a Reason (R) have been put forward. Read both statements carefully and choose the most appropriate option:

- (a) Both (A) and (R) are true and (R) is the correct explanation of (A).
- (b) Both (A) and (R) are true but (R) is not the correct explanation of (A).
- (c) (A) is correct but (R) is wrong.
- (d) (A) is wrong but (R) is correct.

**41.** Assertion (A): Many rivers that flow from Western Ghats to Arabian Sea have very short courses.

Reason (R): The coastal strip between Western Ghats and Arabian Sea is very narrow.

**Ans.** (a) Both (A) and (R) are true and (R) is the correct explanation of (A).

**Explanation:** Western Ghats span from Gujarat to Kerala and Tamil Nadu. Numerous rivers originate from them and drain into the Bay of Bengal and the Arabian Sea. The rivers that flow eastward have very long courses but those flowing westward have shorter courses. This is primarily because the coastal strip between the Arabian Sea and the Western Ghats is very narrow.

#### Related Theory

→ The width of western coastal plains is just around 50 kilometres. On the other hand the width of eastern coastal plains is from 100 to 120 kilometres.

**42.** Assertion (A): Godavari is also known as Dakshin Ganga.

Reason (R): Godavari flows for great length and has a very large basin area. It is the largest peninsular river.

**Ans.** (a) Both (A) and (R) are true and (R) is the correct explanation of (A).

**Explanation:** Godavari is the largest peninsular river and has a very large basin area. It is the largest peninsular river. Due to this, it is also called as Dakshin Ganga. Ganga has the largest basin area in India.

**43. Assertion (A):** Ganga originates from Gangotri Glacier and drains into the Bay of Bengal.

**Reason (R):** Ganga river basin is the largest in the world.

**Ans.** (c) (A) is correct but (R) is wrong.

**Explanation:** Ganga river basin is largest in India but not in the world. The largest river basin in the world is the Amazon river basin.

**44. Assertion (A):** River Indus originates from Tibet, flows westwards, crosses India, enters Pakistan and drains into the Arabian Sea.

**Reason (R):** According to Indus Water Treaty India can use only 20 per cent of the total water carried by the Indus river system.

**Ans.** (b) Both (A) and (R) are true but (R) is not the correct explanation of (A).

**Explanation:** The Indus river originates near Mansarovar lake in Tibet. It flows westward from here and enters India.

### Related Theory

→ In Tibet, the river is also known as "Singhi Khamban" or "Lion's mouth".

**45. Assertion (A):** Rivers perform intensive erosional activity in their upper courses.

**Reason (R):** They have high speeds.

**Ans.** (a) Both (A) and (R) are true and (R) is the correct explanation of (A).

**Explanation:** Rivers have very high speeds in their upper courses which are generally found in High hills and mountains. Here, because of their speeds, they perform a lot of erosion.

Later, these sediments are deposited into plains as the rivers reach their lower courses.

### Related Theory

→ Rivers form:

V shaped Valleys in Upper Course

Meanders and Oxbow lakes in Middle and Lower Courses

Floodplains in Lower Courses

**46. Assertion (A):** The growing domestic, municipal, industrial and agricultural demand for water from rivers naturally affects the quality of water.

**Reason (R):** Water not get polluted by industrial waste disposal.

**Ans.** (c) (A) is correct but (R) is wrong.

**Explanation:** Water can be polluted by all types of waste- industrial, domestic and medical waste being dumped into water bodies without any treatment.

### Related Theory

→ Rising pressure of population is increasing the demand of water. Sources are unable to fulfill this demand and thus, water is a scarcely available resource.

This demand also affects the quality of these resources. Human activities like mining, irrigation and cultivation, industrialisation pollute these water bodies heavily thus compromising its quality.

**47. Assertion (A):** Concern over rising pollution in our rivers led to the launching of various action plans to clean the rivers.

**Reason (R):** The river cleaning programme in the country was initiated with the launching of the Ganga Action Plan (GAP) in 1985.

**Ans.** (b) Both (A) and (R) are true but (R) is not the correct explanation of (A).

**Explanation:** Assertion statement can be a suitable reason for the Reason statement. Ganga action plan was undertaken in 1985 due to the growing concern about pollution of rivers.

# CASE BASED Questions (CBQs)

[ 4 marks ]

Read the following passages and answer the questions that follow.

48. The Godavari is the largest Peninsular river. It rises from the slopes of the Western Ghats in the Nasik district of Maharashtra. Its length is about 1500 km. It drains into the Bay of Bengal. Its drainage basin is also the largest among the peninsular rivers. The basin covers parts of Maharashtra (about 50 percent of the basin area lies in Maharashtra). Madhya Pradesh, Odisha and Andhra Pradesh. The Godavari is joined by a number of tributaries, such as the Purna, the Wardha, the Pranhita, the Manjra, the Wainganga and the Penganga. The last three tributaries are very large. Because of its length and the area it covers, It is also known as the Dakshin Ganga.

- (A) Which river is the largest river of Peninsular India according to the source?
- (B) Name the two tributaries of the river mentioned in the source.
- (C) Where does this river drains?
- (D) Why is this river called Dakshin Ganga?

[Mod. Delhi Gov. QB 2022]

- Ans.** (A) Godavari river is the largest river of Peninsular India.  
(B) Two tributaries of the Godavari river are:  
    (1) Pranhita  
    (2) Wainganga  
(C) Godavari River rises from the district of Nasik in Maharashtra and drains into the Bay of Bengal.



## Related Theory

- It is an eastward flowing river.
  - (D) Godavari is known as Dakshin Ganga because of its huge drainage basin and length which is comparable to river Ganga. Godavari is located in south India and hence it is called Dakshin Ganga.
  - 49. I am a river which originates from the Himalayas. I have the largest river basin in India. I have numerous tributaries out of which Yamuna River is the largest tributary by length. I drain into Bay of Bengal and form the largest delta in the world. I am formed by the confluence of Bhagirathi and Alaknanda at Devprayag. My basin covers 11 states including Uttarakhand, Uttar Pradesh, Madhya Pradesh, Rajasthan, Haryana, Himachal Pradesh, Chhattisgarh, Jharkhand, Bihar, West Bengal and Delhi.
- (A) Identify the river mentioned in the source.  
(B) Which is the largest tributary of this river by volume?  
(C) The confluence of which two rivers forms Ganga?

**Ans.** (A) Ganga

**Explanation:** Ganga River is being talked about in the above passage. The characteristics defined above are of Ganga River.

- (B) The Ghagara river is the largest tributary of Ganga River by volume. It merges with Ganga at Revelganj in Bihar. It is also second largest tributary of Ganga by length.
- (C) Ganga is formed by the rivers Alaknanda and Bhagirathi that meet each other at Devprayag.

50. Four classmates are talking to each other namely Bhagat, Krishna, Ram and Sudama. Ram says that he belongs to a state which shares world's largest river delta. Bhagat says he belongs to a state which has the distinctions that Mahanadi originates from it and it is also home to large tribal population. Krishna says he belongs to a state from which Tapi river originates. Lastly, Sudama says he comes from a state through which Brahmaputra river enters into India.

- (A) Identify the state that Sudama belongs to, as per the given source.
- (B) Which of the four classmates belongs to Chhattisgarh?
- (C) From the conversation between the four classmates, identify the state that Ram belongs to and explain why it is known for having the world's largest river delta.

- Ans.** (A) Brahmaputra enters India by taking a U-turn south of Arunachal Pradesh.  
(B) Bhagat comes from a state from which river Mahanadi originates. Chhattisgarh houses large tribal populations. Mahanadi rises in its highlands too.

(C) Ram belongs to West Bengal because the Sundarbans Delta, which is the world's largest river delta, is located in this state. This delta is formed by the Ganga, Brahmaputra, and Meghna rivers before they flow into the Bay of Bengal. It is also home to the famous Sundarbans mangrove forest, which is known for the Royal Bengal Tiger.

51. The growing domestic, municipal, industrial and agricultural demand for water from rivers naturally affects the quality of water. As a result, more and more water is being drained out of the rivers reducing their volume. On the other hand, a heavy load of untreated sewage and industrial effluents are emptied into the rivers. This affects not only the quality of water but also the self-cleansing capacity of the river. For example, given the adequate stream flow, the Ganga water is able to dilute and assimilate pollution loads within 20 km of large cities. But the increasing urbanisation and industrialisation do not allow it to happen and the pollution level of many rivers has been rising.

- (A) What is the self-cleansing capacity of a river?
- (B) How is the quality of water affected by growing demand?
- (C) Highlight two ways in which river pollution can be prevented.

**Ans.** (A) The self-cleansing capacity of a river can be understood as its capacity to deposit the erosional material including the silt, sediments and pebbles it carries, along the shores or in basins/plain regions. It cleans its own waters by depositing them in basin-like regions.

(B) The quality of water resources is getting affected because the water resources are unable to fulfill this growing demand. Increased competition for resources leads to exploitation which obstructs the natural hydrological cycle. Water resources have no time to rejuvenate themselves and hence quality deteriorates.

Chemicals and other pollutants seep into these bodies affecting their quality as well.

(C) Two ways in which river pollution can be prevented are:

- (1) Treatment of domestic waste before dumping it into the water bodies
- (2) Banning the dumping of industrial and chemical waste into water bodies. Artificial tanks must be created for this disposal instead where the disposed water should be treated, recycled or upcycled to be reused in the industry again.

## SHORT ANSWER Type-I Questions (SA-I)

[ 2 marks ]

52. Which rivers originate - Satpura Ranges in Madhya Pradesh?

**Ans.** Narmada and Tapi River originate in Madhya Pradesh.



### Related Theory

→ Narmada River is known as lifeline of Madhya Pradesh and Gujarat. It contributes significantly to the welfare of both these states.

53. What was the Indus Water Treaty? What is their benefit to India?

**Ans.** According to Indus Water Treaty 1960 India can use only 20 per cent total of all water carried by Indus river.

Providing water to the states of Punjab, Haryana and Rajasthan for irrigation.

54. The Narmada river flows through a Rift valley. Where is this rift valley located?

**Ans.** Narmada river flows through a rift valley situated between Vindhya and Satpura Ranges.

55. Which two rivers come together to form the Sundarban Delta?

**Ans.** Sundarban Delta is formed together by rivers Ganga, Padma, Brahmaputra and Meghna.

(Any two rivers)

56. A geography teacher takes her students on a field trip to Maharashtra, where they visit the banks of the Godavari River, often called the "Dakshina Ganga" (Ganga of the South)." During the trip, she asks the names of at least four major tributaries of the Godavari River.

**Ans.** Godavari is the largest peninsular river. Its tributaries include the Penganga, the Wainganga, the Manjra, the Pranhita, the Wardha and the Purna.

**57. Name the mountain range from where Mahanadi originates and where it drains.**

**Ans.** The Mahanadi river originates from the Sihawa mountains in Chhattisgarh and drains into Bay of Bengal.

**58. Enlist the tributaries of the Krishna river.**

**Ans.** Tributaries of Krishna River include the Bhima, the Musi, the Ghatprabha, the Koyana and the Tungabhadra.

**59. River Narmada during its course creates many picturesque locations. Mention any two.**

**Ans.** Dhuandhar falls and Marble rocks near Jabalpur.

**60. The Himalayan rivers have long courses from their source to the sea.'**

Substantiate the statement with illustrations.

**Ans.** (1) They perform intensive erosional activity in their upper courses.

(2) Carry huge loads of silt and sand with them and deposit it in the plains in the lower courses.

**61. Name the five rivers from Punjab which joins Indus in Pakistan.**

**Ans.** The five rivers of Punjab after which the state has also got its name are Jhelum, Chenab, Beas, Ravi and Satluj.

### Related Theory

→ Punjab consists of "Punj" and "Ab" and these words mean "five" and "water" respectively. Thus Punjab is known as land of 5 rivers.'

**62. 'Rivers contribute towards the national economy or give boost to the economy.' Justify your answer with examples.**

**Ans.** Rivers have been aiding development of civilisations since time immemorial.

- (1) Rivers aid in generating hydroelectric power when humans build dams across rivers. They also help in transportation of people and goods.
- (2) They also attract tourists. People travel to visit their sites like origin, ending, waterfalls, etc., in their course.

### Related Theory

→ The economy of Uttarakhand receives a shot in the arm by river tourism. People throng the state from across India to see various glaciers and rivers.

**63. Underline two points of difference between lakes and lagoons.**

**Ans.** A lagoon is commonly referred as a lake but there are certain differences.

(1) Lakes are categorised as freshwater or saltwater lakes but lagoons are mostly salty as they are mostly connected with the sea through some channel.

(2) Lakes are also generally deeper than lagoons.

**64. 'Indus Rivers is transboundary river that is joined by various tributaries in Kashmir'. Provide evidence to support this statement.**

**Ans.** In the Kashmir region, Indus is joined by tributaries like:

- (1) Zaskar, (2) Hunza, (3) Nubra and (4) Shyok.

**65. How are tributaries different from distributaries? [Delhi Gov. QB 2022]**

**Ans.** Their differences are:

Distributary	Tributary
(1) They are separated from rivers due to the geographical features or climatic conditions.	They ultimately merge into the rivers.
(2) They flow away from the river.	They flow into the rivers or parallel to it at times.

**66. Why does the Brahmaputra river not contain silt while passing long distances in Tibet?**

[Delhi Gov. QB 2022]

OR

→ Why does the Brahmaputra in its Tibetan part have less silt despite its longer course?  
[DIKSHA]

**Ans.** In Tibet, river Indus carries less silt because:

- (1) It is a cold and dry area. It passes through an area which is stable, flat and thus less prone to erosion.
- (2) In its course in India, it passes through a region of high rainfall and from mountain ranges which are prone to erosion.

**67. What are the causes of river pollution?**  
[DIKSHA]

**Ans.** The causes of river pollution are:

- (1) Growing domestic, industrial and agricultural demand—this automatically affects the quality of water resources available in the region.
- (2) Heavy loads of untreated sewage being dumped into the waterbodies.
- (3) Industrial and other domestic water disposed off in the rivers without any treatment.  
(Any two points)

<sup>②</sup>Same answer, different question style

## SHORT ANSWER Type-II Questions (SA-II)

[ 3 marks ]

68. Brahmaputra River originates from Tibet near Mansarovar Lake and drains into Bay of Bengal. Which are its major tributaries that join it after entering India?

**Ans.** Brahmaputra River enters India through Arunachal Pradesh after taking a U-turn just north of Arunachal Pradesh.

- (1) In Arunachal Pradesh, it is known as Dihang River. The tributaries that join it are Lohit and Dibang from left.
- (2) From the right, it is joined by Subansiri, Manas, Kameng, Sankosh and Tista.
- (3) It then enters into Bangladesh and there it is joined by the Ganga River system.

69. Write a short note on the Ganga Action Plan.  
[DIKSHA]

**Ans.** The Ganga Action Plan (GAP) was initiated in 1985. Some of its features/achievements are:

- (1) The Ganga Action Plan Phase 2 was merged with NRCP in 1995. Under this action plan, pollution abatement works are been taken up in various regions.
- (2) A total of around 215 schemes of pollution abatement have been completed under this action plan.
- (3) A million leaders of sewage is targeted to be intersected, diverted and treated.

70. Describe the role of rivers in any economy.  
[DIKSHA]

**Ans.** (1) Water from rivers is essential for various human activities. Therefore, riverbanks have attracted settlers from ancient times. Rivers support their livelihoods.

- (2) These settlements support the livelihoods of various communities living in surrounding settlements too.
  - (3) Rivers also contribute to revenue generation by enabling their waters to be used for irrigation, navigation and transportation of goods and people.
  - (4) Rivers also facilitate hydroelectric power generation, thereby indirectly driving the entire economy by producing electricity for it.
- (Any three points)

71. During his vacation Y visits Nasik and gets to know that Godavari which originates from here also called as Dakshin Ganga and is the most important peninsular river. Now he is curious to know why Godavari is called as Dakshin Ganga and wants to trace its route from origin to end.

**Ans.** Godavari originates from Maharashtra's Nasik district from the Western Ghats. It is also known as Dakshin Ganga due to its length and its large basin.

- (1) It transverses, through the states of Maharashtra, Madhya Pradesh, Andhra Pradesh and Odisha.
- (2) During its entire course, it is joined by various tributaries like Wainganga, Penganga, Manjra, Pranhita, Wardha and Purna. The river finally empties itself into the Bay of Bengal at Andhra Pradesh.

## LONG ANSWER Type Questions (LA)

[ 5 marks ]

72. Amit and his family planned a trip to South India, where they visited several famous rivers like the Godavari, Krishna, and Kaveri. Amit noticed that these rivers had gentle slopes, were not snow-fed, and had many waterfalls along their course. Unlike the rivers in North India, they did not cause frequent floods or change their course often. Based on Amit's observations, explain the key characteristics of the Peninsular River System.

**Ans.** Peninsular River system extends from Narmada and Tapi till Kaveri at the southern end. Some of its characteristics are:

- (1) Western Ghats are a major component of this system. They act as a major water divide in Peninsular India.
- (2) Most rivers of Peninsular India such as the Krishna, the Kaveri, the Godavari and the Mahanadi originate in Western Ghats and flow eastwards and finally drain into the Bay of Bengal forming deltas.

- (3) Most of these east-flowing rivers form deltas at their mouths before draining into the Bay of Bengal.
- (4) Many rivers originate on the western slope of Western Ghats and flow westwards to fall into the Arabian Sea. Some examples are Narmada and Tapi. Both Narmada and Tapi, make estuaries. Other important rivers of this system include Godavari, Krishna, Mahanadi and Kaveri.
- (5) Peninsular rivers seasonal in nature. This is because they receive water from only rainfall.
- (6) Peninsular rivers are comparatively less energetic than Himalayan rivers and thus, they form u-shaped valleys.

(Any five points)

#### **73. Analyse five features of the Himalayan Rivers or the Himalayan River system.**

**Ans.** Indus, Ganga and Brahmaputra are the three major rivers of Himalayan system.

The features of this system are:

- (1) These rivers have long courses and are joined by many minor and major tributaries.
- (2) Himalayan Rivers are perennial in nature, they flow throughout the year. This is because they are fed by melting of snow as well as rainfall.
- (3) They form big deltas on the coast when they meet the ocean. In the upper course they form beautiful gorges and waterfalls and in middle and lower courses they form meanders and flood plains respectively.
- (4) These rivers have very large basins.
- (5) These rivers play a very important role in irrigation in northern plains of India.

#### **74. "Indian rivers are getting polluted by urbanisation". Do you agree? Justify.**

[Delhi Gov. QB 2024]

- Ans.**
- (1) Demand in domestic as well as industrial use affected its quality.
  - (2) Dumping of untreated sewage water from home and industries.
  - (3) Excessive use of chemical fertilizers also pollutes the river bodies.
  - (4) Industrial pollution combined with acid rain also pollutes river.
  - (5) Excessive deforestation led to reduction in rainfall which ultimately affects the water level and pollutes the air.

#### **75. Compare the east and west flowing rivers of the Peninsular plateau. [DIKSHA]**

**Ans.** Major differences are:

East Flowing Rivers	West Flowing Rivers
(1) Originate from Western Ghats and flow eastwards.	Originate from central India and flow westwards.
(2) They flow into the Bay of Bengal.	They flow into the Arabian Sea
(3) These rivers form deltas at their mouths	They form estuaries at their mouths
(4) They carry a large amount of water	They carry a lesser amount of water.
(5) Mahanadi, Kaveri, Krishna and Godavari are some examples.	Narmada and Tapi are examples.

#### **76. Underline the main characteristics of the Ganga- Brahmaputra basin. [DIKSHA]**

**Ans.** The main features of this river basin are:

- (1) The Ganga-Brahmaputra basin drains the northern plains and supports the fertile belt that includes most of North and East India.
- (2) The basin is a rich source of alluvial soil.
- (3) Both rivers are in their lower courses in this region, therefore numerous ox-bow lakes are found all across the plains.
- (4) It is bounded on the north by the mountains and foothills of the Himalayas.
- (5) The eastern boundary of this basin is framed by the gorgeous Sundarbans delta.

#### **77. Why was the Indus Water Treaty signed? Explain the context in five points.**

- Ans.**
- (1) The Indus River System as a whole mainly comprises rivers Indus, Jhelum, Chenab, Ravi, Beas and Sutlej.
  - (2) Indus is a transboundary river with major basin lying in Pakistan and smaller portions being shared by India, China and Afghanistan. But it flows from China to India to Pakistan.

## SELF ASSESSMENT

### Multiple Choice Questions

1. Arrange the rivers according to their point of origin from south to north.

(I) Tapi

(II) Mahanadi

(III) Indus

(IV) Kaveri

Options:

(a) (I), (II), (IV), (III)

(b) (II), (III), (I), (IV)

(c) (IV), (II), (I), (III)

(d) (I), (III), (IV), (II)

(Analyse) 1

2. Sumit and his family live in a village that depends on river water for farming. During summer, they face a water shortage as the nearby river dries up. However, when they visit their relatives in another state, they notice that the river there flows throughout the year, even in the dry season.

Sumit's father explains that some rivers are seasonal, while others are perennial, meaning they have water all year round.

Can you identify which of the following rivers is perennial?

(a) Son

(b) Ganga

(c) Godavari

(d) Narmada

(Understand) 1

3. Identify the geographical feature which is home to the Royal Bengal Tiger.

(a) Northern plains

(b) Estuaries on the Western coast of India

(c) Sundarban Delta

(d) Chilika Lake

(Remember) 1

4. Choose the incorrectly matched pair.

(a) Beas - Indus

(b) Gandak - Ganga

(c) Lohit - Meghna

(d) Koyana - Krishna

(Analyse) 1

### Assertion-Reason (A-R)

In the following questions, two statements in the form of an Assertion (A) and a Reason (R) have been put forward. Read both statements carefully and choose the most appropriate option:

(a) Both (A) and (R) are true and (R) is the correct explanation of (A).

(b) Both (A) and (R) are true but (R) is not the correct explanation of (A).

(c) (A) is correct but (R) is wrong.

(d) (A) is wrong but (R) is correct.

5. Assertion (A): The Namami Devi Narmada programme has been launched by Madhya Pradesh.

Reason (R): The programme was formulated with the purpose of the Narmada river conservation. (Analyse) 1

6. Assertion (A): Lakes are of great value to human beings.

Reason (R): Lakes can be used for developing hydel power.

(Analyse) 1

### Case Based Question

7. Read the following passage and answer the questions that follow.

The growing domestic, municipal, industrial and agricultural demand for water from rivers naturally affects the quality of water. As a result, more and more water is being drained out of the rivers reducing their volume. On the other hand, a heavy load of untreated sewage and industrial effluents are emptied into the rivers. This affects not only the quality of water but also the self-cleansing capacity of the river. For example, given the adequate stream flow, the Ganga water is able to dilute and assimilate pollution loads within 20 km of large cities. But the increasing urbanisation and industrialisation do not allow it to happen and the pollution level of many rivers has been rising. Concern over rising pollution in our rivers led to the launching of various action plans to clean the rivers.

(A) Name one measure undertaken by the Indian government to remedy the state of Indian rivers. (Remember) 1

(B) How does Ganga self-cleanse itself?

(Understand) 1

(C) Mention two causes of river pollution.  
*(Remember)* 2

### **Short Answer Type-I Questions**

8. How are rivers significant for an agricultural economy like India? (Understand) 2

9. What is the Water Divide? Mention two examples of a water divide located in India. (Understand) 2

### **Short Answer Type-II Questions**

10. A group of geography students is on an educational trip to Maharashtra. While exploring a riverbank, their guide tells them,

"This is the second-longest river in India. Based on this information, identify the river and explain its key characteristics.

11. The Indus and Ganga are completely two different rivers. Highlight their differences with valid points. (Analyse) 3

### **Long Answer Type Question**

12. 'Peninsular rivers of India exhibit unique characteristics due to the plateau terrain and their origin in the Western or Eastern Ghats.' Analyse the statement. (Analyse) 5



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