**Introduction**

India has all the major physical features of the earth, i.e., mountains, plains, deserts, plateaus and islands. The land of India displays great physical variation. Geologically, the Peninsular Plateau constitutes one of the ancient land masses on the earth’s surface. The Himalayas and the Northern Plains are the most recent landforms. The northern plains are formed of alluvial deposit

**Location**

* India has all major physical features of the Earth, i.e., mountains, plains, deserts, plateaus, and islands.
* In India, the soil colour varies from place to place as it is formed from different types of rocks.
* India has varied physical features whose formation can be explained on the basis of the ‘Theory of Plate Tectonics’.
* According to the theory of Plate Tectonics, the seven major and minor plates that form the Earth’s crust keep moving, causing stress and thus leading to folding, faulting and volcanic activity.

**Major Physiographic Divisions**

The physical features of India are grouped under the following physiographic divisions:

* The Himalayan Mountains
* The Northern Plains
* The Peninsular Plateau
* The Indian Desert
* The Coastal Plains
* The Islands

**The Himalayan Mountains**

The Himalayas are young-fold mountains which are the loftiest and one of the most rugged mountain barriers of the world. The Himalayan mountains are stretched over the northern borders of India. This mountain ranges run in a west-east direction from the Indus to the Brahmaputra. The Himalayas consists of 3 parallel ranges in their longitudinal extent.

* The northernmost range is known as the Great or Inner Himalayas or the Himadri. It is the most continuous range consisting of the loftiest peaks with an average height of 6,000 metres.
* The folds of the Great Himalayas are asymmetrical in nature. The core of this part of the Himalayas is composed of granite.
* The range lying to the south of the Himadri forms the most rugged mountain system and is known as Himachal or lesser Himalaya.
* Pir Panjal range forms the longest and the most important range.
* The outermost range of the Himalayas is called the Shiwaliks. These ranges are composed of unconsolidated sediments.
* The longitudinal valley lying between the lesser Himalayas and the Shiwaliks is known as Duns. Dehradun, Kotli Dun and Patli Dun are some of the well-known Duns.
* The Himalayas are 2400 km long, 400 km to 150 km wide from Kashmir to Arunachal Pradesh respectively.

The Himalayas have three parallel ranges in the longitudinal extent namely :

* Great or Inner Himalayas also called Himadri.
* Middle Himalayas or Himachal.
* Outer Himalayas or Shiwaliks.

The Himalayas can be divided into four sections on the basis of regions from west to east:

* **Punjab Himalayas** – between Indus and Satluj. The part of the Himalayas lying between Indus and Satluj has been traditionally known as Punjab Himalaya but it is also known regionally as Kashmir and Himachal Himalaya from west to east, respectively.
* **Kumaon Himalayas** – between Satluj and Kali. The part of the Himalayas lying between the Satluj and the Kali rivers is known as Kumaon Himalayas.
* **Nepal Himalayas** – between Kali and the Tista.
* **Assam Himalayas (Eastern Himalayas)** – Between Tista and the Dibang (Tsangpo). The Kali and Teesta rivers divide the Nepal Himalayas and the part lying between Teesta and Dihang rivers is known as Assam Himalayas.
* The Brahmaputra marks the easternmost boundary of the Himalayas.
* Beyond the Dihang gorge, the Himalayas bend sharply to the south and spread along the eastern boundary of India, which is known as the Purvachal or the Eastern hills and mountains. The Purvachal comprises the Patkai Hills, the Naga Hills, the Manipur Hills and the Mizo Hills.

**The Northern Plain**

The northern plain has been formed by the interplay of the 3 major river systems – the Indus, the Ganga and the Brahmaputra along with their tributaries. It spreads over an area of 7 lahks sq. km, 240 km long and 240 km to 320 km broad.

The Northern Plain is broadly divided into 3 sections, as mentioned below:

* The Western part of the Northern Plain is referred to as the Punjab Plains. This plain is formed by the Indus and its tributaries – the Jhelum, the Chenab, the Ravi, the Beas and the Satluj.
* The Ganga plain extends between Ghaggar and Teesta rivers. It is spread over the states of North India, Haryana, Delhi, U.P., Bihar, partly Jharkhand and West Bengal.
* Brahmaputra Plain lies in the state of Assam.

The difference in relief causes the Northern Plains to have four regions.

* **Bhabar** – Adjacent to the foothills of Shiwaliks, a narrow 8 to 16 km wide belt of pebbles and boulders.
* **Bangar** – Older alluvial plain which rises above the level of the flood plains.
* **Khadar** – Newer and younger alluvial of the flood plains deposited by the rivers flowing down the plain.
* **Tarai** – Lies adjacent to Bhabar region, composed of newer alluvium and is thickly forested.

According to the variations in elevation points, the Northern plains can be divided into 4 regions.

* The rivers, after descending from the mountains, deposit pebbles in a narrow belt of about 8 to 16 km in width, lying parallel to the slopes of the Shiwaliks, which is known as Bhabar. All the streams disappear in this Bhabar belt.
* The streams and rivers re-emerge and create a wet, swampy and marshy region known as terai.
* The largest part of the northern plain is formed of older alluvium. It lies above the floodplains of the rivers and presents a terrace-like feature which is known as Bhangar.
* The soil in the Bhangar region contains calcareous deposits and is known as Kankar. The newer, younger deposits of the floodplains are called Khadar.

**The Peninsular Plateau**

The Peninsular Plateau is a tableland composed of old crystalline, igneous and metamorphic rocks. It was formed due to the breaking and drifting of the Gondwana land. One of the distinct features of the Peninsular Plateau is the black soil area known as Deccan Trap.

This plateau consists of 2 divisions:

* **The Central Highlands**: The part of the Peninsular plateau lying to the north of the Narmada River, covering a major area of the Malwa plateau, is known as the Central Highlands. The eastward extensions of this plateau are locally known as the Bundelkhand and Baghelkhand.
* **The Deccan Plateau**: It is a triangular landmass that lies to the south of the river Narmada. An extension of the Plateau is also visible in the northeast, which is known as the Meghalaya, Karbi-Anglong Plateau and North Cachar Hills.

The Western Ghats and the Eastern Ghats mark the western and the eastern edges of the Deccan Plateau, respectively.

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| **Western Ghats** | **Eastern Ghats** |
| Western Ghats lie parallel to the western coast. | The Eastern Ghats stretch from the Mahanadi Valley to the Nilgiris in the South. |
| They are continuous and can be crossed through passes only. | They are discontinuous and irregular. They can be dissected by rivers draining into the Bay of Bengal. |
| They are higher than the Eastern Ghats. Their average elevation is 900–1600 metres. | Their average elevation is 600 metres. |
| Mahendragiri (1,501 metres) is the highest peak in the Eastern Ghats. | Anamudi is the highest peak in the Western Ghats. |

**The Indian Desert**

The Indian desert lies towards the western margins of the Aravali Hills.

* It is a sandy plain covered with sand dunes.
* This region receives very low rainfall, below 150 mm per year.
* It has a dry climate with low vegetation cover.

**The Coastal Plains**

A coastal plain is a flat, low-lying piece of land next to the ocean. To the east and west of the peninsular plateau, 2 narrow strips of plain lands are found, which are respectively called Eastern Coastal Plain and Western Coastal Plain.

**Eastern Coastal Plain**

The Eastern Coastal Plains is a wide stretch of landmass lying between the Eastern Ghats and the Bay of Bengal. In the northern part, it is referred to as the Northern Circar, while the southern part is known as the Coromandel Coast. Large rivers, such as the Mahanadi, the Godavari, the Krishna and the Kaveri, have formed an extensive delta on this coast. Lake Chilika is an important feature along the eastern coast.

**Western Coastal Plain**

The western coast is sandwiched between the Western Ghats and the Arabian Sea. It is a narrow plain and consists of 3 sections, as mentioned below:

* The northern part of the coast is called the Konkan (Mumbai – Goa)
* The central stretch is called the Kannad Plain
* The southern stretch is referred to as the Malabar coast

**The Islands**

An island is a piece of sub-continental land that is surrounded by water. Lakshadweep Islands group in the Arabian Sea is close to Kerala is composed of small coral islands which were earlier known as Laccadive, Minicoy and Amindive.

The entire group of islands is divided into 2 broad categories:

* The Andaman in the north
* The Nicobar in the south

These islands lie close to the equator and experience an equatorial climate, and have thick forest cover.

The diverse physical features of India have immense future possibilities for development because of the following reasons.

* The mountains are the major sources of water and forest wealth.
* The northern plains are the granaries of the country. They provide the base for early civilisations.
* The plateau is a storehouse of minerals, which has played a crucial role in the industrialisation of India.
* The coastal region and island groups provide sites for fishing and port activities.

**Question** The Northern Plains has been formed by the interplay of three major river systems, namely \_\_\_\_\_\_\_\_ .

**Answer** The Indus-Ganga-Brahmaputr

**Question** The formation of the Northern Plains of India is a result of extensive

**Answer** Alluvial deposits

**Question** The most continuous range consisting of the loftiest peaks with an average height of 6,000 metres is known as the \_\_\_\_\_\_\_\_ .

**Answer** Himadri

**Question** Name the western and the eastern edges of the Deccan Plateau.

**Answer** The Western Ghats and the Eastern Ghats.

**Question** The part lying between Teesta and Dihang rivers is the \_\_\_\_\_\_\_\_ .

**Answer** Assam Himalayas

**Question** Name the mountain ranges located in the eastern part of India.

**Answer** Purvachal or the eastern hill and mountain.

**Question** The valleys lying between Lesser Himalayas and the Shiwaliks are known as the \_\_\_\_\_\_\_\_ .

**Answer** Duns

**Question** The hills of Purvachal or the Eastern hills are composed of \_\_\_\_\_\_\_\_ .

**Answer** Sedimentary rocks

**Question** Due to the deposition of silt, the rivers in their lower course split into numerous channels, known as \_\_\_\_\_\_\_\_ .

**Answer** Distributaries

**Question** According to the ‘Theory of Plate Tectonics,’ what are the effects of the movement of the plates?

**Answer** Change in position and size of continents, and formation of ocean basins.

**Question** What are barchans?

**Answer** Barchans are crescent-shaped dunes found in the Indian desert.

**Question** Which is the highest peak in India?

**Answer** Kanchenjunga

**Question** The largest delta in the world is \_\_\_\_\_\_\_\_ .

**Answer** Sunderban Delta

**Question** Which two hills are in the southeast of the Eastern Ghats?

**Answer** Javadi Hills and Shevroy Hills

**Question** What do we mean by the term ‘Bhangar’?

**Answer** Bhangar is the older alluvial soil region lying above the floodplains and presenting a terrace like feature.

**Question** What is the name of the part of the Himalayas lying between the Kali and the Teesta rivers?

**Answer** The part of the Himalayas lying between the Kali and the Teesta rivers is called Nepal Himalayas.

**Question** The state of Meghalaya forms a part of which physiographic division of India?

**Answer** Meghalaya is a part of the eastern extension of the Peninsular Plateau.

**Question** What do you understand by the term “peninsula”?

**Answer** Peninsula is a landmass that is bounded by sea on three sides.

**Question** Name the Indian state where Kanchenjunga is located.

**Answer** Kanchenjunga is located in Sikkim.

**Question** What do you understand by ‘duns’?

**Answer** The longitudinal valley lying between lesser Himalayas and the Shiwaliks are known as duns.

**Question** What is the Peninsular Plateau composed of?

**Answer** The Peninsular Plateau is composed of igneous and metamorphic rocks.

**Question** Which is the largest inhabited riverine island in the world?

**Answer** Majuli, in the Brahmaputra river, is the largest inhabited riverine island in the world.

**Question** What do you mean by the word ‘Doab?

**Answer** ‘Doab’ is made up of two words— ‘do’ meaning ‘two’ and ‘ab’ meaning ‘water’.

**Question** What is the shape of the Deccan Plateau?

**Answer** The Deccan Plateau is a triangular landmass that lies to the south of the river Narmada.

**Question** The newer, younger deposits of the flood plains are called \_\_\_\_\_\_\_\_ .

**Answer** Khadar

**Question** The flow of rivers, the Chambal, the Sindh, the Betwa and the Ken, is from \_\_\_\_\_\_\_\_ .

**Answer** outhwest to northeast

**Question** Which river drains the Chotanagpur Plateau?

**Answer** The Damodar river drains the Chotanagpur Plateau.

**Question** The Indian Desert lies towards the western margin of \_\_\_\_\_\_\_\_ .

**Answer** Aravali hills

**Question** The Lakshadweep islands covers a small area of \_\_\_\_\_\_\_\_ .  
**Answer** 32 sq. km.

**Question** How long and wide are the Himalayas?

**Answer** The Himalayan region extends along the north of India. The Himalayas are the longest and the highest mountain range in the world. The Himalayas are 2400 km long, 400 to 150 km wide from Kashmir to Arunachal Pradesh respectively.

**Question** Which range of the Himalayas has hill stations?

**Answer** The lower ranges or the Lesser Himalayas have beautiful hill stations such as Srinagar, Shimla, Mussoorie, Nainital and Darjeeling. Many people visit these hill stations in summer, because these places are cooler than the plains.

**Question** Name the three types of plate boundaries. Which one of them lies in the Himalayan belt?

**Answer**

* The three types of plate boundaries are Convergent, Divergent and Trans form.
* The Himalayas have been formed by the convergent boundary.

**Question** How the Himalayas have been divided on the basis of regions from west to east?

**Answer**

* Punjab Himalayas: These divisions have been demarcated by river valleys. The part of Himalayas lying between Indus and Satluj has been traditionally known as Punjab Himalaya, but it is also known regionally as Kashmir and Himachal Himalaya from west to east respectively.
* Kumaon Himalayas: The part of the Himalayas lying between Satluj and Kali rivers is known as Kumaon Himalayas.
* Nepal Himalayas: The Kali and Teesta rivers demarcate the Nepal Himalayas.
* Assam Himalayas: the part lying between Teesta and Dihang rivers is known as Assam Himalayas.

**Question** Which are the three main ranges of the Himalayas?

**Answer** The Himalayas have three ranges which run almost parallel to each other. The distance between these ranges is wider in the west and becomes narrow in the east.  
These ranges are—

* the Outer Himalayas or the Shiwalik Range
* the Middle Himalayas or the Himachal Range and
* the Inner or Great Himalayas or the Himadri.

**Question** Describe the “Theory of Plate Tectonics”.

**Answer** Earth scientists have attempted to explain the formation of physical features with the help of some theories based on certain evidences. One such Plausible theory is the ‘Theory of Plate Tectonics’. According to this theory, the crust (upper part) of the earth has been formed out of seven major and some minor plates. The movement of the plates results in the building up of stresses within the plates and the continental rocks above, leading to folding, faulting and volcanic activity

**Question** Why is the soil in the Northern Plain fertile?

**Answer** The soil of this plain has been formed by the sediments brought down by the rivers from the Himalayas. Such plain is called an alluvial plain and it is very fertile. This plain is one of the largest and most fertile plains of world. It is the most thickly populated plain. This is also the major crop growing area in India. This plain is drained by river Ganga, Brahmaputra and their tributaries. The slope of this plain in the west is south-west and in the east is south-east.

An area through which a river and its tributaries flow is called its basin.

**Question** Which plateau lies between the Aravali and the Vindhya range? Write a brief note on this plateau.

**Answer** The Malwa Plateau lies between the Aravali hills and the Vindhya range. The Aravali hills lie to the west of the plateau and the Vindhya range lies to its south. The part of the peninsular plateau lying to the north of the Narmada river, covering a major area of the Malwa plateau, is known as the Central Highlands.

The Malwa plateau lies in Madhya Pradesh. It is composed of extensive lava flows. There are rolling plains separated by flat-topped hills. The plateau is largely broken in form of ravines near the Chambal Valley in its east.

**Question** What do you mean Great Himalayas? Write its two characteristics.

**Answer** The northern most range of the Himalayas is known as the Great or Inner Himalayas or the Himadri.

(a) It is the most continuous range consisting of the loftiest peaks with an average height of 6000 metres. It contains all prominent Himalayan peaks.

(b) Its folds are asymmetrical in nature and its core is composed of granite rock. It is perennially snow bound, and several glaciers descend from this range.

**Question** How was the Great Northern Plains of India formed?

**Answer** The formation of the Himalayas due to upliftment of sediments out of the Tethys Sea and subsidence of the northern flank of the Peninsular Plateau resulted in the formation of a large basin. In due course of time this depression, gradually got filled with deposition of sediments by the rivers flowing from the mountains in the north and the peninsular plateau in the south. A flat land of extensive alluvial deposits led to the formation of the northern plains of India.

**Question** Write a short note on ‘coral polyps’.

**Answer** Coral polyps are short-lived microscopic organisms, which live in colonies. They flourish in shallow, mud-free and warm waters. They secrete hard rock like substance. The coral secretion and their skeletons from coral deposits in the form of reefs.  
They are mainly of three kinds—barrier reef, fringing reef and atolls. The Great Barrier Reef of Australia is a good example of the first kind of coral reefs. Atolls are circular or horse shoe-shaped coral reefs.

**Question** Write a short note on the Western Coastal Plains.

**Answer** The Peninsular plateau is flanked by stretch of narrow coastal strips, running along the Arabian Sea on the west and the Bay of Bengal on the east. The western coast, sandwiched between the Western Ghats and the Arabian Sea, is a narrow plain. It consists of three sections. The northern part of the coast is called the Konkan (Mumbai-Goa), the central stretch is called the Kannad Plain while the southern stretch is referred to as the Malabar coast.

**Question** Why are the Himalayas called as young mountains?

**Answer** The Himalayas were formed recently in the earth’s history as a result of compression.  
The sediments beneath the ocean were folded due to the compression and got uplifted. Therefore, they are known as young fold mountains. These mountains are still rising. The whole mountain represents a very youthful topography with high peaks, deep valleys and fast flowing rivers.

**Question** Write any three features of the Shiwalik range.

**Answer** The three features of the Shiwalik range are :

(a) This is the outermost range of the Himalayas.

(b) The average altitude varies from 900 to 1100 metres.

(c) These ranges are composed of unconsolidated sediments brought down by rivers from the main Himalayan ranges.

**Question** Describe the river systems of the Northern Plains.

**Answer** The three river systems in the Northern plains from east to west are the Brahmaputra, Ganga and Indus. A large part of the Indus system lies in Pakistan. The Indus and its tributaries – the Jhelum, the Chenab, the Ravi, the Beas and the Satluj originate in the Himalayas. This section of the plain is dominated by the doabs. The Ganga plain extends between the Ghaggar and Teesta rivers. It spreads over the states of Haryana, Delhi, Uttar Pradesh, Bihar, parts of Jharkhand and West Bengal. It has tributaries like the Yamuna, Gomati, Ghaghara, Son, Gandak and Kosi. The Brahmaputra Plain lies in Arunachal Pradesh and Assam.

**Question** “The northern plains have diverse relief features”. Explain.

**Answer** Northern plains have great diverse relief features. According to the variations in relief features, the Northern plains can be divided into four regions. The rivers, after descending from the mountains deposit pebbles in a narrow belt of about 8 to 16 km in width lying parallel to the slopes of the Shiwaliks. It is known as bhabar. All the streams disappear in this bhabar belt. South of this belt, the streams and rivers re-emerge and create a wet, swampy and marshy region known as terai. The largest part of the northern plain is formed of older alluvium. It lies above the floodplains of the rivers and presents a terrace like feature. This part is known as bhangar. The soil in this region contains calcareous deposits, locally known as kankar. The newer, younger deposits of the flood plains are called khadar.

**Question** Write a short note on Deccan Plateau.

**Answer** The Deccan Plateau is a triangular landmass that lies to the south of the river Narmada. The Satpura range flanks its broad base in the north, while the Mahadev, the Kaimur hills and the Maikal range form its eastern extensions. The Deccan Plateau is higher in the west and slopes gently eastwards. An extension of the Plateau is also visible in the northeast, locally known as the Meghalaya, Karbi-Anglong Plateau and North Cachar Hills. It is separated by a fault from the Chotanagpur Plateau. Three prominent hill ranges from the west to the east are the Garo, the Khasi and the Jaintia Hills. The Western Ghats and the Eastern Ghats mark the western and the eastern edges of the ‘ Deccan Plateau respectively.

**Question** Write in detail about the Himalayan mountains.

**Answer**

* The Himalaya mountains lie between the Indus river and the Brahmaputra river which covers a distance of about 2,400 kilometres. They consist of three parallel ranges-the Himadri, the Himachal and the Shiwaliks from north to south. The Himadri or the Great Himalayas is the highest of all with an average height of more than 6,000 metres above sea level. It contains some of the world’s highest peaks, such as Mt. Everest in Nepal (8,848 metres high, the highest peak in the world), Kanchanjunga, Nanga Parbat, Nanda Devi, Dhaulagiri, Makalu and Annapurna. Kanchenjunga (8,598 metres) in Sikkim is the highest peak of the Himalayas in India.
* To the south of the Himadri is the Himachal, also called the Middle or Lesser Himalayas. The range is mainly composed of highly compressed and altered rocks. The altitude varies between 3,600 and 4,500 metres and the average width is of 50 km. Many important hill stations such as Shimla, Manali, Kullu, Mussourie, Nainital and Darjeeling are situated in the Himachal range.
* The southern-most range, which is rather discontinuous, is the Shiwalik. The extend over a width of 10-50 km and have an altitude varying between 900 and 1100 metres. There are a number of broad longitudinal valleys called duns, especially in the Kumaon Himalayas of Uttarakhand. Dehradun is situated in one such valley. There are many passes like the Shipki La, Nathu La and the Bomdi La in the Himalayas.

**Question** What is the significance of the Northern Plains?

**Answer T**he significance of the Northern Plain are :

* This plain is made up of the alluvial soil brought down by the rivers. This soil is very soft and fertile. Major crops such as wheat, rice, sugarcane, pulses, oil seeds, etc. are grown here. This plain is the ‘food bowl’ of India.
* The land of this plain is soft, levelled and flat. Therefore, wells, tubewells and canals can be dug for irrigation. Due to proper irrigation, it is the largest producer of foodgrains in india.
* This plain gets sufficient rainfall. There are many rivers, streams and lakes. There is also rich vegetation. These factors affect the climate. The climate of the Northern Plains is very cold in winter and very hot in summer.
* This is one of the most thickly populated plain of the world. The most thickly populated states of India, Uttar Pradesh and Bihar, lie in this plain.

**Question** What is the significance of Himalayas?

**Answer** The significance of Himalayas is as follows :

(a) The Himalayas stand like a mighty mountain wall in the north of India. They ‘ separate the Indian subcontinent from the rest of Asia.

(b) They have vast snowfields and glaciers which are the source of numerous perennial rivers. These rivers provide water for irrigation, navigation and generation of hydel power.

(c) The Himalayas act as a climatic barrier. They protect the Northern Plains from freezing cold winds. They also stop and deflect the rain-bearing winds.

(d) The forests in the Himalayas provide a suitable habitat for wildlife. They also have many wildlife sanctuaries.

(e) The Himalayas also have many beautiful hill stations like Shimla, Mussoorie, Nainital and Darjeeling, which attract tourists.

**Question** How do different physiographic regions of India complement each other?

**Answer** A detailed account of the different physiographic units highlights the unique features of each region :

(a) Each region complements the other and makes the country richer in its natural resources.

(b) The mountains are the major source of water and forest wealth.

(c) The Northern Plains are the granaries of the country. They provided the base for early civilizations.

(d) The plateau is a storehouse of minerals, which has played a crucial role in the industrialization of the country.

(e) The coastal region and island groups provide sites for fishing and port activities. Thus, the diverse physical features of the land have immense future possibilities of development.

**Question** which part of the Himalayas is known as Purvachal? Write a short note on the Purvachal Himalayas.

**Answer:** The eastern hills and mountains of the Himalayas running along the eastern boundary of India are known as Purvachal. They are in the northeastern states of India.

The Brahmaputra marks the eastern-most boundary of the Himalayas. Beyond the Dihang gorge, the Himalayas bend sharply to the south and spread along the eastern boundary of India. They are known as the Purvachal or the Eastern hills and mountains. These hills running trough the north-eastern states are mostly composed of strong sandstones, which are sedimentary rocks. Covered with dense forests, they mostly run as parallel ranges and valleys. The Purvachal comprises the Patkai hills, the Naga hills, the Manipur hills and the Mizo hills.