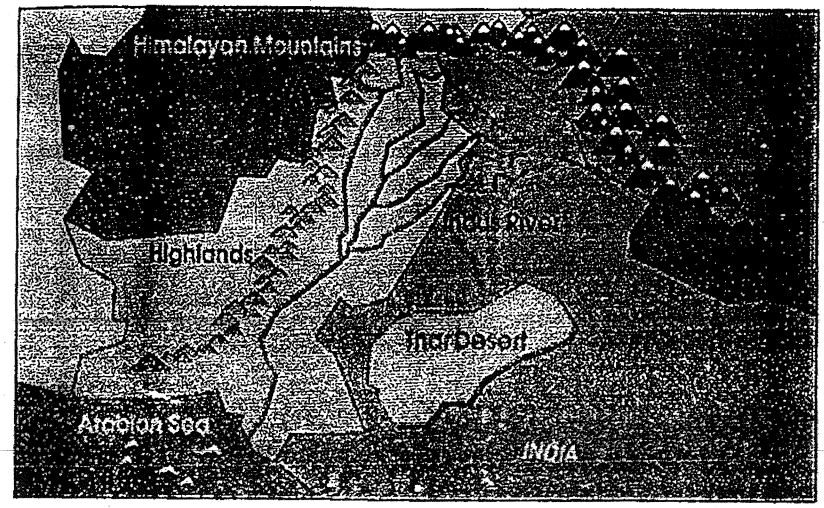
Physical Features of India



"Our country has practically all major physical features of the earth i.e. mountains, plains, deserts, plateaus and islands. You must be wondering how these physical features have been formed. We will learn more about major physical features of India and how they have been formed."

India is a vast country with varied landforms. In fact, our country has practically all major physical features of the earth i.e. mountains, plains, deserts, plateaus and islands.We find different types of rocks; some are very hard like marble which has been used for making the Taj Mahal, and some are very soft like soap stone which is used in making talcum powder. The colour of soil varies from one place to the other because soil is formed out of different types of rocks. Most of these variations are caused due to differences in rock formations.

India is a large landmass formed during different geological periods which has influenced her relief. Besides geological formations, a number of processes such as weathering, erosion and deposition have created and modified the relief to its present form.

According to the "Theory of Plate Tectonics", the crust 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. Broadly, these plate movements are classified into three types.

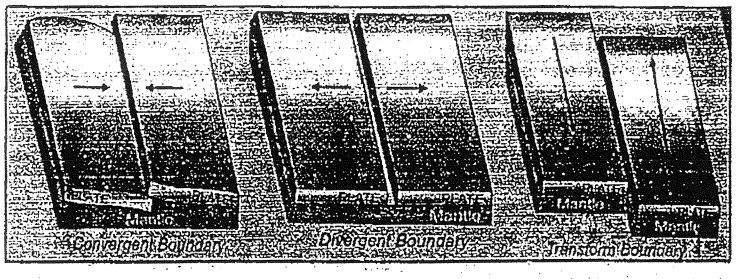


Fig.1 Plate Boundaries

While some plates come towards each other and form convergent boundary. Some plates move away from each other and form divergent boundary. In the event of two plates coming together they may either collide and crumble, or one may slide under the other. At times, they may also move horizontally past each other and form transform boundary. The movement of these plates have changed the position and size of the continents over millions of years. Such movements have also influenced the evolution of the present landform features of India.

THE SPOT LIGHT

India's border area with various countries:

a. Border with Bangladesh: 4,096.70 km
b. Border with Bhutan: 6,99 km
c. Border with China: 3,488 km
d. Border with Myanmar: 1,643 km
e. Border with Nepal: 1,751 km
f. Border with Pakistan: 3,323 km

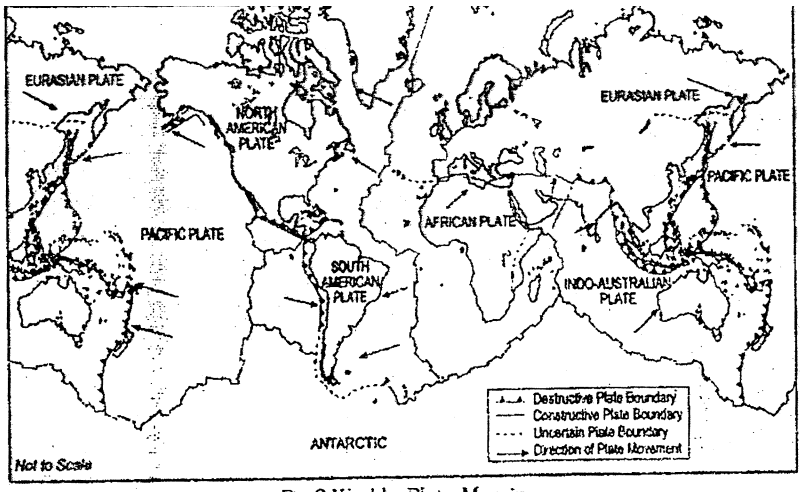


Fig.2 World : Plate Margins

9.1 Formation of Himalayas

The oldest landmass, (the Peninsula part), was a part of the Gondwana land. The Gondwana land included India, Australia, South Africa, South America and Antarctica as one single land mass. The convectional currents split the crust into a number of pieces, thus leading to the drifting of the Indo-Australian plate after being separated from the Gondwana land, towards north. The northward drift resulted in the collision of the plate with the much larger Eurasian Plate. Due to this collision, the sedimentary rocks which were accumulated in the geosyncline known as the Tethys were folded to form the mountain system of western Asia and Himalaya.

9.2 Formation of Northern Plains

The Himalayan uplift 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.

Land of India displays great physical variation - Geologically, the Peninsular Plateau constitutes one of the ancient landmasses on the earth's surface. It was supposed to be one of the most stable land blocks. The Himalayas and the Northern Plains are the most recent landforms. From the view point of geology, Himalayan mountains form an unstable zone. The whole mountain system of Himalaya represents a very youthful topography with high peaks, deep valleys and fast flowing rivers. The northern plains are formed of alluvial deposits. The peninsular plateau is composed of igneous and metamorphic rocks with gently rising hills and wide valleys.

9.3 Major physiographic divisions

The physical features of India can be grouped under the following physiographic divisions (Figure 2.4):

(1) The Himalayan Mountains
(2) The Northern Plains
(3) The Peninsular Plateau
(4) The Indian Desert
(5) The Coastal Plains
(6) The Islands

THE SPOT LIGHT

Most volcanoes and earthquakes in the world are located at plate margins, but some do occur within the plates.

THE SPOT LIGHT

Kanchenjunga, situated at an altitude of 8, 598 m above the sea level is the highest point of India. Kuttanad, in the state of Kerala, which is located at 2.2 m below the sea level, is the lowest point of the nation.

THE SPOT LIGHT

Gondwana land: It is the southern part of the ancient super continent Pangea with Angara Land in the northern part.

(a) The Himalayan Mountains

Geologically young and structurally fold mountains stretch over the northern borders of India. Run in a west-east direction from the Indus to the Brahmaputra. Represents the loftiest and one of the most rugged mountain barriers of the world. They form an arc, which covers a distance of about 2,400 Km. Their width varies from 400 Km in Kashmir to 150 Km in Arunachal Pradesh. The altitudinal variations are greater in the eastern half than those in the western half.

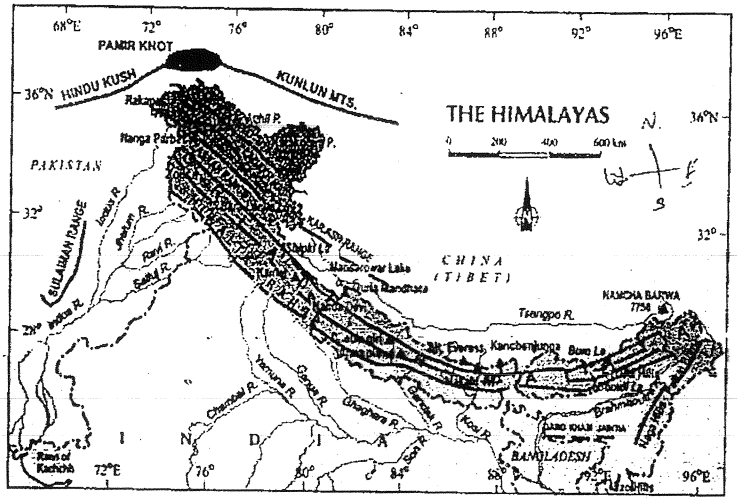


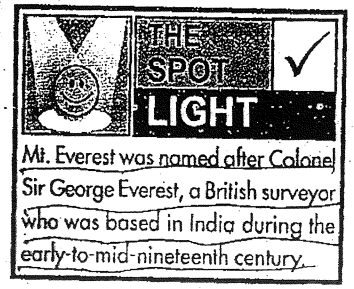
Fig.3 Himalayas

Peak	Country	Height in metres
Mt. Everest	Nepal	8848
Kanchenjunga	India	8598
Makalu	Nepal	8481
Dhaulagiri	Nepal	8172
Nanga Parbat	India	8126
Annapurna	Nepal	8078
Nanda Devi	India	7817
Kamet	India	7756
Namcha Barwa	India	7756
Gurla Mandhata	Nepal	7728

Fig.4 Some highest peaks of the Himalayas

The Himalayas consist of three parallel ranges in its longitudinal extent.

(i) **Himadri or Inner Himalayas -** The northern most 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. It contains all the prominent Himalayan peaks. The folds of Great Himalayas are asymmetrical in nature. The core of this part of Himalayas is composed of granite. It is perennially snow bound, and a number of glaciers descend from this range.



CHECK YOUR LEARNING 7.1

1 The names of the glaciers and passes that lie in Great Himalayas

2 The name of the states where highest peaks are located.

(ii) **Himachal or lesser Himalaya -** The range lying to the south of the Himadri forms the most rugged mountain system, mainly composed of highly compressed and altered rocks. The altitude varies between 3,700 and 4,500 metres and the average width is of 50 Km. While the Pir Panjal range forms the longest and the most important range, the Dhaula Dhar and the Mahabharat ranges are also prominent ones. This range consists of the famous valley of Kashmir, the Kangra and Kullu Valley in Himachal Pradesh. This region is well known for its hill stations.

(iii) **Shiwaliks -** The outer most range of the Himalayas, extends over a width of 10-50 Km and has an altitude varying between 900 and 1100 metres. These ranges are composed of unconsolidated sediments brought down by rivers from the main Himalayan ranges located farther north. These valleys are covered with thick gravel and alluvium. The longitudinal valley lying between lesser Himalaya and the Shiwaliks

Fig.5 The Himalayas

are known as Duns. Dehra Dun, Kotli Dun and Patli Dun are some of the well-known Duns.

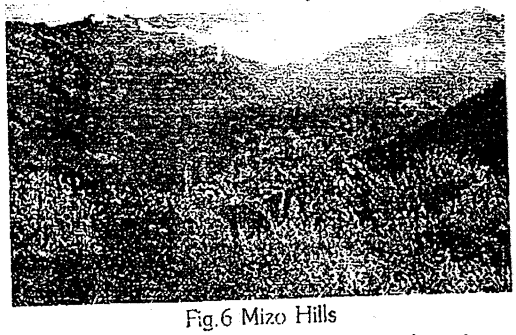


Fig.6 Mizo Hills

(iii) Division of Himalayas on the basis of regions from west to east. These divisions have been demarcated by river valleys.

(a) The part of Himalayas lying between Indus and Satluj traditionally known as Punjab Himalaya also known regionally as Kashmir and Himachal Himalaya from west. It is to east respectively.

(b) The part of the Himalayas lying between Satluj and Kali rivers is known as Kumaon Himalayas.

(c) The Kali and Tista rivers demarcate the Nepal Himalayas.

(d) And the part lying between Tista and Dihang rivers is known as Assam Himalayas. The Brahmaputra marks the eastern most boundary of the Himalayas.

(e) Beyond the Dihang gorge, the Himalayas bend sharply to the south and espread along the eastern boundary of India. They are known as the Purvanchal or the Eastern hills and mountains. These hills running through 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 Purvanchal comprises the Patkai hills, the Naga hills, Manipur hills and the Mizo hills.

THE SPOT LIGHT

Majuli, in the Brahmaputra River is the largest inhabited riverine island in the world.

THE SPOT LIGHT

The Himalayas are the third largest deposit of ice and snow in the world, after Antarctica and the Arctic. There are approximately 15,000 glaciers located throughout the range. At 48 miles (72 km) in length, the Himalayan Siachen glacier is the largest glacier outside the poles. Other notable glaciers located in the Himalayas include the Baltoro, Biafo, Nubra, and Hispur.

THE SPOT LIGHT

'Doab' is made up of two words- 'do' meaning two and 'ab' meaning water. Similarly 'Punjab' is also made up two words- 'Punj' meaning five and 'ab' meaning water.

(b) The Northern Plain

It has been formed by the interplay of the three major river systems, namely- the Indus, the Ganga and the Brahmaputra along with their tributaries. It is formed of alluvial soil. It spreads over an area of 7 lakh sq. km. The plain being about 2400 Km long and 240 to 320 Km broad, is a densely populated physiographic division, and is agriculturally a very productive part of India. The rivers coming from northern mountains are involved in depositional work. In the lower course, due to gentle slope, the velocity of the river decreases which results in the formation of riverine islands.The rivers in their lower course split into numerous channels due to the deposition of silt. These channels are known as distributaries.

The Northern Plain is broadly divided into three sections.

(i) The Western part of the Northern Plain is referred to as the Punjab Plains. Formed by the Indus and its tributaries, the larger part of this plain lies in Pakistan. The Indus and its tributaries-the Jhelum, the Chenab, the Ravi, the Beas and the Satluj originate in the Himalaya. This section of the plain is dominated by the doabs.

Fig.8 The Northern Plains

THE SPOT LIGHT

The Chilika Lake is the largest salt water lake in India. It lies in the state of Orissa, to the south of the Mohanadi delta. It is famous as a winter home for migratory birds.

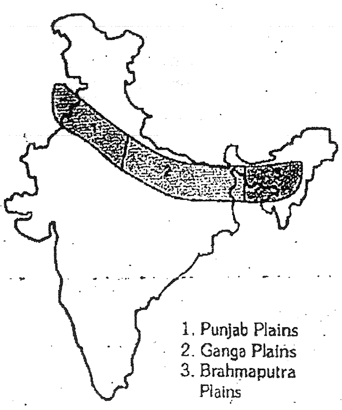


Fig.9 The Northern Plains

CHECK YOUR ANSWERS 7.1

1. Passes are Nathu la Pass, Jelepa pass, Rohtang pass, Mohan Pass, Mustag Pass,
2. Glaciers are Khumbu Glacier, Gangotri Glacier, Yamunotri Glacier, Siachen Glacier, Kyagar Glacier, Mudui Glacier, Stagar Glacier, K2 Glacier, Quogir Glacier, Gasherbrum Glacier.

(ii) 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 to its East.

(iii) In Assam lies the Brahmaputra plain and extends from Paschim Banga, through Assam and Bangladesh to India's eastern border.

According to the variations in relief features, the Northern plains can be divided into four regions.

(i) 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.

(ii) South of this belt, the streams and rivers re-emerge and create a wet, swampy and marshy region known as terai. This was a thickly forested region full of wildlife. The forests have been cleared to create agricultural land and to settle migrants from Pakistan after partition.

(iii) The largest part of the northern plain is formed of older alluvium. They lie above the flood plains of the rivers and present a terrace like feature. This part is known as bhangar. The soil in this region contains calcareous deposits locally known as kankar.

(iv) The newer, younger deposits of the flood plains are called khadar. They are renewed almost every year and so are fertile, thus, ideal for intensive agriculture.

THE SPOT LIGHT

India's only active volcano is found on Barren island in Andaman and Nicobar group of Islands.

(c) The Peninsular Plateau

A tableland composed of the old crystalline, igneous and metamorphic rocks, formed due to the breaking and drifting of the Gondwana land and thus, making it a part of the oldest landmass. The plateau has broad and shallow valleys and rounded hills. This plateau consists of two broad divisions-

(1) The Central Highlands - It lies to the north of the Narmada river covers a major area of the Malwa plateau. The Vindhyan range is bounded by the Central Highlands on the south and the Aravalis on the northwest. The further westward extension gradually merges with the sandy and rocky desert of Rajasthan. The flow of the rivers draining this region, namely the Chambal, the Sind, the Betwa and Ken is from southwest to northeast, thus indicating the slope.

Fig.10 A waterfall in Chotanagpur Plateau

(2) The Central Highlands are wider in the west but narrower in the east. The eastward extensions of this plateau are locally known as the Bundelkhand and Baghelkhand. The Chotanagpur plateau marks the further eastward extension, drained by the Damodar river.

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 separate by a fault from the Chotanagpur Plateau. Three prominent hill ranges fror the west to east are the Garo, the Khasi and the Jaintia Hills.

The Western Ghats and the Eastern Ghats mark the western and the easter edges of the Deccan Plateau respectively. Western Ghats lie parallel the western coast. They are continuous and can be crossed through pass only. The Western Ghats are higher than the Eastern Ghats. Their avera elevation is 900-1600 metres as against 600 metres of the Eastern Gha The Eastern Ghats stretch from the Mahanadi Valley to the Nigiris in t south. The Eastern Ghats are discontinuous and irregular and dissected rivers draining into the Bay of Bengal. The Western Ghats cause orograp rain by facing the rain bearing moist winds to rise along the western slo of the Ghats. The Western Ghats are known by different local names. height of the Western Ghats progressively increases from north to so The highest peaks include the Anai Mudi (2,695metres) and the D Betta (2,637 metres). Mahendragiri (1,501 metres) is the highest pea the Eastern Ghats. Shevroy Hills and the Javadi Hills are located to southeast of the Eastern Ghats.

(3) One of the distinct features of the peninsular plateau is the black soil known as Deccan Trap. This is of volcanic origin hence the rocks are ign Actually these rocks have denuded over time and are responsible fo formation of black soil. The Aravali Hills lie on the western and northwe margins of the peninsular plateau. These are highly eroded hills ar found as broken hills. They extend from Gujarat to Delhi in a south northeast direction.

THE SPOT LIGHT

Thar Desert or Great Indian Desert, extensive arid region, c.500 mi (800 km) long and c.250 mi (400 km) wide, S Asia, in NW India and E Pakistan, between the Indus and Sutlej river valleys on the west and the Aravalli Range on the east. Largely a desolate region of shifting sand dunes, broken rocks, and scrub vegetation, it receives an annual average rainfall of less than 10 in. (25 cm).

Fig.11 Thar desert

THE SPOT LIGHT

The sparsely populated region has a pastoral economy. Through the extension of canals fed with Sutlej and Beas waters, irrigation has reclaimed some land for agriculture along the northern and western edges. In May, 1974, India exploded its first nuclear device in the desert in Rajasthan state.

(d) The Indian Desert

The Indian desest lies towards the western margins of the Aravali Hills. It is an undulating sandy plain covered with sand dunes. This region receives very low rainfall below 150 mm per year. It has arid climate with low vegetation cover. Streams appear during the rainy season. Soon after they disappear into the sand as they do not have enough water to reach the sea. Luni is the only large river in this region. Barchans (crescent shaped dunes) cover larger areas but longitudinal dunes become more prominent near the Indo-Pakistan boundary.

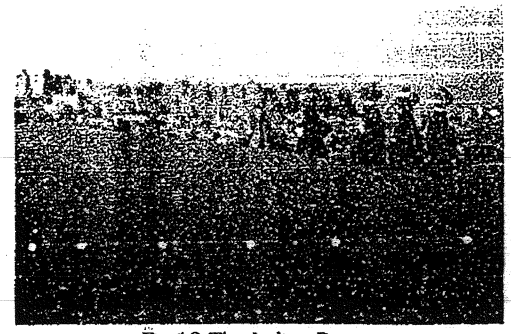


Fig.12 The Indian Desert

(e) The Coastal Plains

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. The plains along the Bay of Bengal are wide and level. 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 extensive delta on this coast. Lake Chilika is an important feature along the eastern coast.

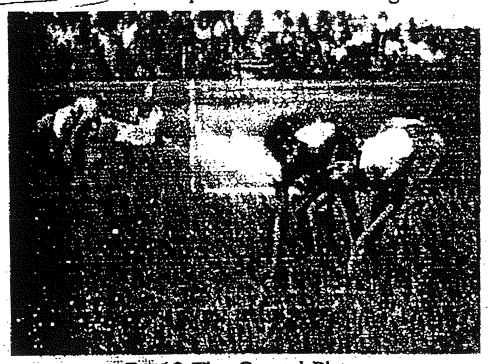


Fig.13 The Coastal Plains

(f) The Islands

(i) Lakshadweep Islands group lies close to the Malabar coast of Kerala. This group of islands is composed of small coral isalnds. Earlier they were known as Laccadive, Minicoy and Amindive. In 1973 these were named as Lakshadweep. It covers small area of 32 sq km. Kavaratti island is the administrative headquarters of Lakshadweep. This island group has great diversity of flora and fauna. The Pitli island, which is uninhabited, has a bird sanctuary.

Northern plains form the repositary of cultural and ancient heritage of India The birth place of green revolution, these are the most densely populated regions of the world(40% of Indian population lives here).

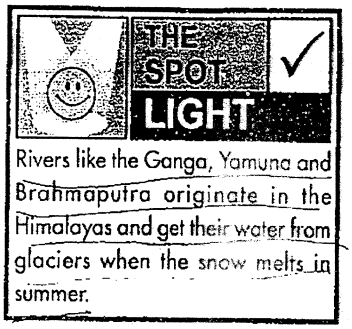
The northern plains are abode of many holy places , temples and monuments such as Ayodhya, Golden Temple, Pataliputra, etc. These places not only have a religious significance but are also important from tourism point of view which forms the invisible portion of our balance of trade.

The nutrients deposited by himalayan rivers make the soil rich and fertile for growing a variety of crops here.

(ii) The elongated chain of islands located in the Bay of Bengal extending from north to south are Andaman and Nicobar islands. They are bigger in size and are more numerous and scattered. The entire group of islands is divided into two broad categories - The Andaman in the north and the Nicobar in the south. It is believed that these islands are an elevated portion of submarine mountains. These island groups are of great starategic importance for the country. There is great diversity of flora and fauna in this group of islands too. These islands lie close to equator and experience equatorial climate and has thick forest cover.

Fig.14 An Island

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



Rivers like the Ganga, Yamuna and Brahmaputra originate in the Himalayas and get their water from glaciers when the snow melts in summer.

IMPORTANT TERMS

ALLUVIAL / ALLUVIUM DEPOSITS

Clay, silt or gravel carried by rushing streams and deposited where the stream slows down.

CONVERGENT BOUNDARY

A tectonic boundary where two plates are moving towards each other. If the two plates are of equal density, the usually push up against each other, forming a mountain chain. If they are of unequal density, one plate usuall sinks beneath the other in a subduction zone. The western coast of South America and the Himalayan mountain are convergent plate boundaries.

CORAL ISLAND AND CORAL REEF

A coral island forms a ring and partially or totally encloses a shallow body of water or lagoon. It is formed b small organisms called polyps. These tiny organisms protect themselves by building small walls of limeston around their bodies. These creatures live in small colonies, and over millions of years, these 'settlements' becom reefs and then turn into islands.

DECCAN TRAPS

They are a large igneous area located on the Deccan Plateau and are one of the largest volcanic features on Earth. They consist of multiple layers of solidified basalt that together are more than 2000 m thick and cover an area of 5 lakh sq km. The term 'trap' is used in geology for such rock formations as it refers to the step-like hills forming the landscape of the region. They formed between 60 and 68 million years ago at the end of the Cretaceous period.

DISTRIBUTARY

It is a stream that branches off and flows away from a main stream channel. They are common features of river deltas. Distributaries usually occur as a stream nears a lake or the ocean, but they can also occur when a tributary stream bifurcates as it nears its confluence with a larger stream. An example is the Hugli river in Paschim Banga, which is a distributary of the Ganga.

DOAB

It is a term used for a 'tongue' or tract of land lying between two confluent rivers. If used without any qualifying name, it refers to the fertile land of the Northern Plains lying between the Ganga and Yamuna rivers.

FAULTING

It is the process of planar rock fractures which show evidence of relative movement.

FOLDING

A process through which crystalline rocks are bent. It produces anticlines (upfolds) and synclines (downfolds). It takes place in three main stage, initial bending of rocks as plates come together, creation of simple anticlines and synclines, and formation of fold mountains as well as breaking of the folding resulting in faults/depressions.

GEOLOGICAL PERIOD

A unit of geological time during which a system of rocks is formed.

GEOSYNCLINE

A term used for a subsiding linear trough that was caused by the accumulation of sedimentary rock strata deposited in a basin and subsequently compressed, deformed and uplifted into a mountain range.

PHYSIOGRAPHIC DIVISION

The landforms of the Earth are generally divided into physiographic divisions, consisting of physiographic provinces, which in turn consists of physiographic section.

RELIEF

The variations in elevation of an area of the Earth's surface.

RIVERINE ISLAND

An island in a river.

1 FORMATIVE ASSESSMENT

choice questions

1. Which of the following has not been a factor in the creation and modification of India's relief features?
(1) Geological formations
(2) Population density
(3) Weathering
(4) Erosion and deposition

2. Which of the following is a plausible theory presented by Earth scientists to explain the formation of continents and oceans and the various landforms?
(1) Theory of Motion
(2) Theory of Plate Tectonics
(3) Theory of Evolution
(4) Theory of Relativity

3. According to the 'Theory of Plate Tectonics,' the earth's crust is formed of how many major plates?
(1) Three (2) Five (3) Seven (4) Ten

4. According to the 'Theory of Plate Tectonics,' when some plates come towards each other, which of the following is formed?
(1) Convergent boundary
(2) Divergent boundary
(3) Transform boundary
(4) Colliding boundary

5. A landmass bounded by sea on three sides is referred to as
(1) Coast (2) Island
(3) Peninsula (4) None of the above

6. Which of the following divisions of India has the oldest landmass?
(1) The Himalayas
(2) The Northern Plains
(3) The Peninsular Plateau
(4) The Indian Desert

7. Which of the following countries or continents was not a part of the ancient landmass of Gondwanaland?
(1) India (2) Australia
(3) Europe (4) South America

8. Which of the following physiographic divisions of India was formed out of accumulations in the Tethys geosyncline?
(1) The Himalayas
(2) The Northern Plains
(3) The Peninsular Plateau
(4) The Indian Desert

9. Which part of the Himalayas is perennially snowbound ?
(1) Great Himalayas or Himadri
(2) Lesser Himalayas or Himachal
(3) Shivaliks
(4) Purvanchal

10. Which of the following is the highest peak in India?
(1) Mt. Everest (2) Kanchenjunga
(3) Nanga Parbat (4) Nandadevi

11. Which of the following is not a mountain pass in the Great Himalayas?
(1) Bara Lapcha La and Shipkila
(2) Nathula
(3) Khyber pass
(4) Jojila and Lipu Lekh

12. Which two hills are located in the south-east of Eastern Ghats ?
(1) Mizo Hills and Naga Hills
(2) Javadi Hills and Shevroy Hills
(3) Patkoi Hills and Manipuri Hills
(4) Mizo Hills and Patkoi Hills

13. The northern plains is formed of
(1) Black soil (2) Red soil
(3) Alluvial soil (4) Desert soil

14. The wet and swampy belt of the Northern Region is known locally as :
(1) Bhabar (2) Terai
(3) Doab (4) Bhangar

14. The highest peak in the Eastern Ghats is -
(1) Anai Mudi (2) Doda Betta
(3) Mahendragiri (4) Gurushikhar

15. The only large river in the Indian Desert
(1) Chambal (2) Sabarmati
(3) Chenab (4) Luni

16. Barchans are found in
(1) Northern Plains (2) Mountains
(3) islands (4) deserts

17. Large rivers such as the Mahanadi, the Godavari, the Krishna have formed extensive delta on this coast
(1) western coastal plains (2) eastern coastal plains
(3) both of them (4) none of them

18. This island is the administrative headquarters of Lakshadweep
(1) Minicoy (2) Kavaratti
(3) Pitli (4) Amindive

19. The western coastal strip, south of Goa is referred to as ;
(1) Coromandal (2) Kannad
(3) Konkan (4) Malabar

20. Which islands of India are called Coral Islands?
(1) Lakshadweep (2) Andman and Nikobar
(3) Both (4) None of these

True or false

1. India is a large landmass formed during different geological periods which has influenced her relief.

2. The Angara land included India, Australia, South Africa, South America and Antarctica as one single land mass.

3. The altitudinal variations of Himalayas are greater in the eastern half than those in the western half.
4. Lesser Himalayas are composed of unconsolidated sediments brought down by rivers from the main Himalayan ranges located farther north.
5. All the streams disappear in this terai belt. South of this belt, the streams and rivers re-emerge and create a wet, swampy and marshy region known as bhabar.
6. The Western Ghats and the Eastern Ghats mark the western and the eastern edges of the Deccan Plateau respectively.
7. The Indian desest lies towards the eastern margins of the Aravali Hills.
8. Lake Chilika is an important feature along the eastern coast.

Fill in the blanks

1. In the event of two plates coming together they may either collide and crumble, or one may slide under the other. At times, they may also move ..... past each other and form transform boundary.
2. The ..... constitutes one of the ancient landmasses on the earth's surface. It was supposed to be one of the most stable land blocks.
3. In the lesser Himalayas, while the ..... range forms the longest and the most important range, the Dhaula Dhar and the Mahabharat ranges are also prominent ones.
4. The ..... comprises the Patkai hills, the Naga hills, Manipur hills and the Mizo hills.
5. The newer, younger deposits of the flood plains are called .....
6. The ..... are wider in the west but narrower in the east. The eastward extensions of this plateau are locally known as the Bundelkhand and Baghelkhand.
7. The ..... is an undulating sandy plain covered with sand dunes. This region receives very low rainfall below 150 mm per year.
8. ..... group of islands is composed of small coral isalnds.

Match the column

1.

	Column A		Column B
(A)	Bhabhar	(i)	they are renewed almost every year and so are fertile, thus, ideal for intensive agriculture
(B)	Terai	(ii)	part of Himalayas lying between Tista and Dihang rivers
(C)	Bhangar	(iii)	a narrow belt of about 8 to 16 km in width lying parallel to the slopes of the Shiwaliks
(D)	Khadar	(iv)	was a thickly forested region full of wildlife. The forests have been cleared to create agricultural land and to settle migrants from Pakistan after partition.
(E)	Punjab Himalaya	(v)	largest part of the northern plain is formed of older alluviam
(F)	Assam Himalaya	(vi)	part of Himalayas lying between Indus and Satluj

Crossword puzzle

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

E	M	K	U	N	L	N	A	T	H	U	L	A	R	I	A	H	I	A	T
M	H	A	S	J	M	A	N	J	K	M	A	J	L	B	H	O	R	P	J
J	N	V	F	A	E	T	D	C	A	R	D	E	M	O	M	L	O	M	K
C	R	E	I	I	9	H	M	O	I	F	T	N	X	M	A	X	F	C	T
N	M	T	S	N	A	U	O	R	M	S	A	N	A	D	I	D	A	N	J
A	B	X	A	T	G	A	R	O	U	L	F	V	D	L	K	P	T	D	C
C	Y	C	H	I	G	A	M	M	R	D	T	I	Z	L	A	J	P	O	K
H	R	T	E	A	N	C	H	E	N	J	U	N	O	A	L	U	L	B	E
O	O	M	O	P	I	T	P	N	O	S	S	D	D	K	S	P	D	O	K
T	D	A	N	M	L	M	D	D	C	S	A	H	I	S	A	I	E	E	J
A	R	R	E	A	G	T	H	A	R	H	E	Y	D	H	U	A	I	A	R
N	3	A	A	L	I	A	T	L	E	I	Y	A	B	A	Y	T	H	R	L
A	Z	V	N	W	R	E	D	S	P	P	A	N	H	D	A	O	J	U	K
G	O	A	M	A	I	M	U	D	I	K	D	P	M	W	D	A	B	P	E
P	A	L	L	J	S	H	B	V	R	I	Y	E	V	E	R	E	S	T	M
U	O	I	M	Y	R	Y	P	A	T	L	I	G	J	E	I	T	H	A	R
R	K	I	Q	S	L	A	H	C	N	A	V	R	V	P	E	A	T	S	P

EXERCISE # 1 ANSWER KEY FORMATIVE ASSESSMENT

Multiple choice questions

Que.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Ans.	2	2	3	1	3	3	3	1	1	2	3	2	3	3	4	4	2	2	3	1

True or false

1. True **2.** False **3.** True **4.** False **5.** False **6.** True **7.** False **8.** True

Fill in the blanks

1. horizontally **2.** Peninsular Plateau **3.** Pir Panjal **4.** Purvachal,
5. khadar **6.** Central Highlands **7.** Indian desert **8.** Lakshadweep

Match the column

1. (A) → iii ; (B) → iv ; (C) → v ; (D) → i ; (E) → vi ; (F) → ii

EXERCISE # 2 SUMMATIVE ASSESSMENT

Short answer type questions

1. "The land of India is characterised by a great diversity in its relief or physical features". Justify the statement.
2. Write four points to explain the extent, length, width and height of the Himalayas.
3. How are the Himalayas divided in the east-west direction?
4. What is the 'bhabar' ?
5. Mention some features of the Ganga Basin.
6. Why are Himalayas called the young fold mountains?
7. Distinguish between a delta and an estuary.
8. Mention any four features of the Peninsular plateau.
9. What is Purvanchal ?
10. Write any three features of Karakoram mountain range.

Long answer type questions

1. Give an account of the Island groups of India.
2. Contrast the relief of the Himalayan region with that of the Peninsular Plateau.
3. Give a brief account of the great plains of North India.
4. What are the uses of the Himalayas? Explain.
5. Differentiate between Western Himalayas and Eastern Himalayas.
6. Describe the Theory of Plate Tectonics?
7. Where would one find the most volcanoes and earthquake zones in the world and why?
8. Name the major physiographic divisions of India. Write a note on any one of the physiographic divisions of India.
9. Write a note on the Indian desert describing its location and relief.

NCERT QUESTIONS WITH ANSWERS

1. Choose the right answer from the four alternatives given below :

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

(1) Coast (2) Island (3) Peninsula (4) None of the above.

Ans. Peninsula

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

(1) Himachal (2) Uttaranchal (3) Purvanchal (d) None of the above

Ans. Purvanchal

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

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

Ans. Konkan

(iv) The highest peak in the Eastern Ghats is

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

Ans. Mahendragiri

2. Answer the following questions briefly

(i) What are tectonic plates ?

Ans. Large fragments of the Earth's crust torn due to the rising currents are called tectonic plates.

(ii) Which continents of today were part of the Gondwanaland?

Ans. South America, Africa and Australia.

(iii) What is the 'Bhabar'?

Ans. Bhabar is a pebble studded formation situated at the junction of mountain and plain.

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

Ans. The Great or the Inner Himalayas or the Himadri, the Middle Himalayas or the Himachal, and the Outer Himalayas or the Shivaliks.

(v) Which plateau lies between the Aravali and the Vindhya ranges? Ans. The Malwa plateau lies between the Aravali and the Vindhya Ranges.

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

Ans. Lakshadweep Islands is the island group of India having coral origin.

3. Distinguish between

(i) Converging and Diverging Tectonic Plates.

Ans.

	Converging Plates		Diverging Plates
(a)	When tectonic plates move towards they each other, they are called converging plates.	(a)	When tectonic plates move away from each other, they are termed as diverging plates.
(b)	When they move towards each other, or crumble or one of them slides under the other.	(b)	When they move away from each other, they collide they do not collide or crumble.
(c)	Converging plates cause folds.	(c)	Diverging plates cause fractures in the crust.

(ii) Bangar and Khadar.

Ans.

	Bangar		Khadar
(a)	Formed of older alluvium	(a)	Renewed every year.
(b)	Lies above flood plains of rivers.	(b)	Is newer, younger deposit of flood
(c)	Presents a terrace like feature.	(c)	Contains calcerous deposits locally known as Kankar.
(d)	Less fertile	(d)	More fertile

(iii) Western Ghats and the Eastern Ghats.

Ans.

	Western Ghats		Eastern Ghats
(a)	They stand like a continuous wall and can be crossed through passes only. Thal Ghat provides passage to rails and roads.	(a)	They are discontinuous and irregular. They have been dissected by rivers which have made their passages toreach the Bay of Bengal.
(b)	This range is a source of many large rivers.	(b)	No big river originates from this range.
(c)	It obstructs the monsoon winds coming the from the Arabian Sea which causes heavy rainfall in the Western Coastal Plain.	(c)	They are almost parallel to monsoons originating in the Bay of Bengal and do not cause much rainfall.

4. Describe how the Himalayas were formed.

Ans. Geologists claim that a sea was located where the Himalayas now stand. Internal and external changes of Earth's crust occurred. It is said that one of the crustal plates, called the Indo- Australian plate, separated from the super-continent named Gondwanaland. It drifted slowly towards the north to collide with the Eurasian plate five million years ago. The northern edge of the Indo-Australian plate was pushed beneath the Eurasian plate. After the collision of these two plates, the sedimentary rocks of enclosed ocean folded to form the Himalayas.

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

Ans. The major physiographic divisions of India are :

(i) The Great Mountains of the North. (ii) The North Indian Plain.

(iii) The Peninsular Plateau (iv) The Coastal Plains and (v) The Islands.

	Himalayan Region		Peninsular Plateau
(a)	This region comprises greatest and highest mountain ranges of the world.	(a)	Rugged and dissected terrain plateau is a remnant portion of the supercontinent the Gondwanaland.
(b)	The ranges have I-shaped and U-shaped valleys.	(b)	It has horsts, rift valleys and troughs.
(c)	It is the origin of perennial rivers.	(c)	It has rainfed, seasonal rivers.
(d)	Young fold mountains made from the uplift of the strata formed by the sedimentary rocks	(d)	Created from igneous and metamorphic rocks after splitting of Gondwanaland.
(e)	Parallelly arranged mountain ranges are separated by valleys and plains.—	(e)	Rivers dissect. Faults and vertical movement of the Earth mark the plateau.

6. Give an account of the Northern Plains of India.

Ans. The Northern Plains have been formed from the alluvium that the mountain rivers deposited here. This turned the soil on the surfaced land fertile for growing a rich harvest of variety of crops. This led to the development of the Indus River Valley Civilisation. The rich soil was further aided by favourable climate and constant water supply from the rivers. Between the mouths of the Indus and the Ganga-Brahmaputra, the North Indian Plain covers a distance of 3200 km. It is 300 to 150 km wide at some places. The North Indian Plains have the Indus river system in the west and the Ganga-Brahmaputra river system in the east. The first includes Jhelum, Chenab, Ravi, Beas, Satluj. The Indus flows into the Arabian Sea.

The second includes Ganga, its tributaries and the Brahmaputra which combine as Meghna as they drain into the Bay of Bengal. They form the world's largest and fastest growing delta. The difference in relief has led the North Indian Plains to be divided into four zones :

(i) Bhabhar (ii) Tarai (iii) Bangar and (iv) Khadar

7. Write short notes on the following.

(i) The Indian Desert

Ans. Lying towards the western margins of the Aravali Hills, the Indian desert is formed of sandy plain covered with sand dunes. Receiving less than 10 mm rainfall in a year, the region has arid climate, low vegetation and streams that appear only in the rainy season. But they soon disappear into the sands, lacking enough water to reach the sea. Large areas of the deserts have crescent shaped sand dunes, i.e. barchans, while longitudinal dunes are abundant near Indo- Pakistan boundary.

(ii) Central Highlands.

Ans. The northern part of the Peninsular Plateau consists of plateaus, denuded mountain ranges and low hills made of igneous rocks. In the north-west are the Aravali range, running in south-west, north-east direction forming a discontinuous ridge. Thar Desert lies to the west of Aravali ranges. The southern boundary is demarcated by the Vindhya Range with Kaimur Hills in the eastern extent. The Malwa plateau lies between Aravalis and Vindhyas. Between the valleys of Narmada and the Son, escarpments are formed by the Vindhyan Kaimur range.

(iii) Island groups of India.

Ans. The Lakshadweep consists of many small islands located opposite the Kerala coast in the Arabian Sea. The islands of this group are formed of coral deposits called 'atolls' in Malayalam which refer to their ring or 'horse-shoe' shape. The Andaman and Nicobar Islands, on the other hand, are larger in size. They are more in number and more widely scattered. There are about 200 islands in the Andaman group and 19 islands in the Nicobar group.

MAP SKILLS

On an outline map of India show the following.

(i) Mountain and hill ranges - the Karakoram, the Zaskar, the Patkai Bum, the Jaintia, the Vindhya range, the Aravali, and the Cardamom hills.

(ii) Peaks - K2, Kanchenjunga, Nanga parbat and the Anai Mudi.

(iii) Plateaus - Chhota Nagpur and Malwa

(iv) The Indian Desert, Western Ghats, Lakshadweep Islands