



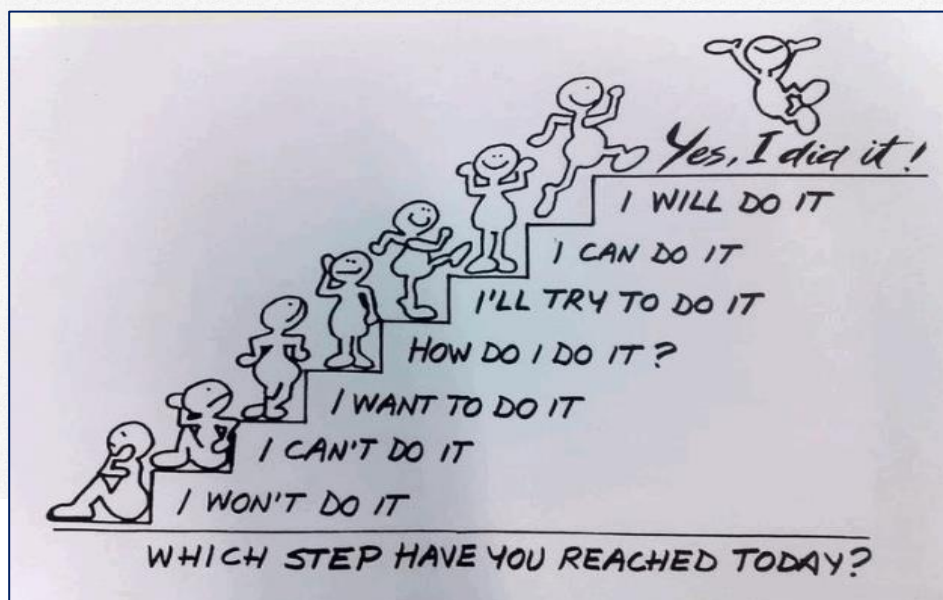
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PAPER- II

GEOGRAPHY

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WHICH STEP HAVE YOU REACHED TODAY?

UNIT-10: GEOGRAPHY OF INDIA

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Section-1 : Unit at a Glance

Sub unit-1

Physiographic Divisions of the Himalaya

For a systematic study of the physiographic and relief, the Himalaya may be divided into the following four divisions from north to south:

- a) The Trans-Himalaya
- b) The Greater Himalaya
- c) The Lesser Himalaya and
- d) The Shiwaliks or the Outer Himalaya.

Longitudinal Divisions of the Himalaya

The Himalaya have also been divided by Sir.S.Burrard into four divisions, namely (i) The Western Himalaya, (ii) The Kumaun Himalaya, (iii) the Nepal Himalaya, (iv) The Assam Himalaya. Prof.S.P.Chatterjee (1973), divided the Himalaya into the following six transverse divisions from west to east.

- a) The Kashmir Himalaya
- b) The Himachal Himalaya
- c) The Kumaun Himalaya
- d) The Central Himalaya
- e) The Eastern Himalaya

Main Mountain Passes of Himalayas

A mountain pass is a route through a mountain range or over a ridge. A pass plays a significant role in trade, war or migration.

Glaciers and Snowline

A glacier is a body of dense ice that drifts under its own weight. A glacier is formed by accumulation of snow exceeding its ablation point over many years. It is the largest reservoir of fresh water on the earth (about 75%).

THE GREAT PLAINS OF INDIA

The Great Plains of India lies to the south of the Shiwalik separated by the Himalayan Front fault (HFF). It is a transitional zone between the Himalaya of the north and Peninsular India of the south. It is an aggregational plain formed by the alluvial deposits of the Indus, Ganga, Brahmaputra and their tributaries. The plain stretches for about 2400 km from west to east. It has varying width, 90-100 km in Assam, 160 km near Rajmahal (Jharkhand), 200km in Bihar, 280 km near Allahabad and 500 km in Punjab. In general, the width of the plain increases from east to west.

Meso-regions of the Northern Plains of India

On the basis of geo-climatic and topographical characteristics, the Northern Plains of India may be divided into the following four meso-regions.

- a) The Plains of Rajasthan;
- b) The Punjab Haryana Plains;
- c) The Ganga Plains; and
- d) The Brahmaputra Plains.

Physiography and relief features of Peninsular India :

Covering an area of about 16 lakh sq km, the peninsular upland forms the largest physiographic division of India. With a general elevation between 600-900 m, the region constitutes an irregular triangle with its base lying between the Delhi Ridge and the Rajmahal Hills and the apex formed by Kanyakumari.

THE COASTAL PLAINS

The peninsular plateau of India is flanked by narrow coastal plains of varied width from north to south, known as the West-Coastal Plains and the East-Coastal Plains. These coastal plains differ from each other. They were formed by the depositional action of the river and the erosional and depositional actions of the sea waves.

According to geologist, the origin of the western and eastern coasts of India may be attributed to the faulting and subsidence of the Arabian Sea and the Bay of Bengal towards the close of the Eocene Period. Consequently, alluvial deposits along these coasts are very recent origin, ranging from Pliocene to recent times. These coastal plains have the evidence of submergence and emergence. The Indian coastal plains may be subdivided into the following three division: (i) The Gujrat Coastal Plain, (ii) The West Coastal Plain, and (iii) The East Coastal Plain.

THE INDIAN ISLANDS

Indian Has a total of 615 island, of which 572 lies in the Bay of Bengal, and remaining 43 in the Arabian Sea. Out of the 572 islands of Andaman and Nicobar, only 36 are inhabited. The Bay of Bengal islands include the Andaman and Nicobar Islands which are largely tectonic and volcanic in origin, while the islands of the Arabian Sea are mainly coral formations. Moreover, there are a number of offshore islands along the mouth of the Ganga, eastern and western coasts and in the Gulfs of Khambat, Kachchh and Mannar.

VULCANICITY

A volcano is an opening in the crust of the earth, connected by a conduit to underlying magma chamber, from which molten lava, volcanic gases, steam, and pyroclastic materials are ejected. It is Usually in the form of a peak which may be cone shaped or dome-shaped depending on the type of volcano and type of material ejected. The main causes of volcanic eruptions are associated with sea-floor spreading, plate-tectonics, and mountain building processes.

Sub unit-2

The Drainage System of India

The drainage system is an integrated system of tributaries and a trunk stream which collect and funnel surface water to the sea, lake or some other body of water. The total area that contributes water to a single drainage system is known as a 'Drainage basin'. This is a basic spatial geomorphic unit of a river system distinguished from a neighboring basin by ridges and highlands that form divides. Thus, river basins are natural units of land.

Drainage patterns :

A geometric arrangement of streams in a region; determined by slope, differing rock resistance to weathering and erosion, climate, hydrologic variability and structural controls of the landscape is known as a 'Drainage Pattern'. In other words drainage pattern refers to a design which a river and its tributaries form together, from its source to its mouth. The factors controlling the pattern of drainage in a region include the topography, slope, structural control, nature of all, the tectonic activities, supply of water and above the following types of drainage patterns are found :

The Himalayan Drainage :

The Himalayan drainage system comprises all the international rivers of Indian, i.e., the Indus, the Ganga, and the Brahmaputra. Most of these rivers and their major tributaries are perennial in character, obtaining their water from the glaciers and rains. These rivers are in their youthful stage carving out a number of erosional land-forms like waterfalls, cataracts, rapids, gorges, steep slopes, and river terraces. The Himalayan rivers are not only eroding agents. But are depositing agents in the plains and deltas.

Irrigation :

Irrigation in India includes network of major and minor canals from Indian rivers, ground water well based system, tanks and other rain water harvesting project for agricultural activities. Of the ground water system is the largest. In 2013-2014 only about 36.7% of total agricultural land in India was reliably irrigated and remaining 2/3rd cultivated land in India is dependent on monsoons.

Sub Unit-3**INDIAN MONSOON**

Monsoon is a complex meteorological phenomenon. Experts of meteorology have developed a number of concepts about the origin of monsoons.

JET STREAM AND INDIAN MONSOON

Jet stream is the most prominent movement in upper level westerly wind flows irregular concentrated meandering bands of geostrophic wind travelling at a speed of 300 to 400 kmph. The jet streams are high altitude (9000 to 12000 m) westerly winds between middle latitudes (summer $35^{\circ}N$ to $45^{\circ}N$; winter $20^{\circ}N$ – $35^{\circ}N$) in the Northern Hemisphere. Recent researches have shown that these winds exert considerable impact on surface weather conditions.

SEASON IN INDIA

The subcontinent of India has great latitudinal dimensions: there are different seasons from Kanyakumari (Cape-Camorin) to Jammu and Kashmir.

RAINFALL DISTRIBUTION

The distribution of rainfall in India is highly uneven. Its distribution is largely controlled by the nearness of the sea and the orographic features. The influence of the Western Ghats, the Plateau of Meghalaya, the north-eastern hills, and the Himalaya mountain is quite significant. The average annual distribution of rainfall in India has been shown in. it may be observed from (Fig.) that the regional variations in the distributions of average annual rainfall over India are quite pronounced. In the southern parts of the Meghalaya plateau (Mawsynram and Cherrapunji), the average annual rainfall is more than 1200 cm or less in the Brahmaputra valley and the adjoining hills.

CLIMATIC REGIONS OF INDIA

India is often referred to as a country with tropical monsoon type of climate. The large size of India, its latitudinal extent, the presence of the Himalayas in the north, and the Indian Ocean, Arabian Sea and Bay of Bengal in the south have resulted in great variations in the distribution of temperature and precipitation in the subcontinent of India.

KOPEN'S CLASSIFICATION OF INDIAN CLIMATE

A Koppen's classification is empirical in nature based on climatic data. Koppen, for the delineation of climatic regions took into consideration (i) the mean monthly temperature, (ii) the mean monthly rainfall, and (iii) the mean annual rainfall.

CLIMATIC DIVISION BY STAMP AND KENDREW

Professor L.D. Stamp and Kendrew divided India into several climatic divisions. This classification is arbitrary and subjective. Stamp used 18°C isotherm of mean temperature for January to divide the country into two broad climatic regions, namely:

Sub Unit-4

Mineral Resources

A mineral is aggregate of two or more than two elements. A mineral has a definite chemical composition, atomic structure and is formed by inorganic process.

Sub Unit-5

Types of Rural Settlements

1. Compact (Agglomerated, Clustered or Nucleated Settlement)

A compact settlement has a well defined form in which the house are clustered in a small space.

Sub Unit-6

Agricultural Productivity

Agricultural Productivity is a Synonym for agricultural efficiency. They yield per unit area is known as agricultural productivity. Agricultural Productivity is generally the result of the Physical, Socioeconomic, and cultural farmer. Agricultural Productivity, however, is a dynamic concept which changes in space and time.

Cropping Patterns

The cropping pattern is an indicator to show the proportion of area under different crop at definite point of time. The crop statistics published by the government are used to denote the cropping patterns.

Agricultural Regionalization

Region is one of the basic concepts in geography. It has been defined differently by different geographers. A Widely accepted definition of region is “an area that is differentiated from other areas according to a specific criteria” “In other word, geo region is differentiated segment of the earth surface (whitt lesey, 1936)”.

Sub Unit- 7

Industrial Development during the Five-Year Plans

The real growth and development of the industrial sector in India started during the period of Five-Year Plans.

Industrial Policy

The first industrial policy was announced by the government of India on 6 April, 1948. In this policy both the public and private sectors were involved towards industrial development.

Sub Unit- 8

Transport Communications and Trade

Transport – Provisions of quality and efficient infrastructure services are essential to realise the full potential of growth impulses surging through the economy.

2. Golden Quadrilateral –

The National Highways Development Project (NHDP) has taken up a massive programme of road building in the country. Launched in January 1999, the Golden Quadrilateral (GQ) project is perhaps one of the largest projects of road building in the country with a length of 5846 km.

Sub Unit-9

Regional Planning

Planning is a process to achieve certain objectives and goals. In fact, it is a process of human thought, and action based upon that through. Planning is believed to be related fundamentally to human beings, their behaviour, their aspirations, their thoughts, and their abilities.

Human Development Index

The Human Development Index (HDI) is a statistic composite index of life expectancy, education, and per capita income indicators, which are used to rank countries into four tiers of human development. A country scores a higher HDI when the lifespan is higher, the education level is higher, and the gross national income per capita is higher. It was developed by Pakistani Economist Mehabub ul Haq (1990) and Indian Economist Amartya Sen.

Sub Unit-10

Environmental Hazards

Most of the environmental hazards are natural hazards such as earthquakes, volcanoes, landslides, hurricanes, cyclones, typhoons, tornadoes, lightning, tsunami, floods, droughts, and epidemics.

Globalization And Indian Economy

The concept of globalization was introduced in the Indian economy in July 1991. It was a part of the structural adjustment package during the period of the government of Prime Minister Narasimha Rao. The government soon applied for a loan of \$2.3 billion from the International monetary Fund (IMF) and began fulfilling the anticipatory conditionalities, including two successive devaluations and withdrawal of export subsidies, to smoothen the passage of the application (Agarwal lads, 1995, P.182). The annual budget of July 1991 fully reflected the structural adjustment package, which came to be known as the New Economic Policy (NEP).



Section-2 : Key Statement

Basic key Statements:

Metamorphic rocks,(10.1.2) Sea floor Spreading (10.1.2) sediments (10.1.2) Duns (10.1.3) Glaciers and snowline (10.1.6) Great plain (10.1.8) Tarai Tract (10.1.8) Coastal Plain (10.1.11) Island (10.1.13) Vulcanicity (10.1.14) Drainage pattern (10.2.2) Dendritic Drainage (10.2.2) Tributaries (10.2.5) Waterfall (10.2.8) monsoon (10.3.1) Rural Settlement (10.5.1) Crop Combination (10.6.9) Backward Area (10.9.3) Integrated Area (10.9.2) Tsunami (10.10.1) Earthquake(10.10.1)

Standard Key Statements:

Pangia (10.1.2) Anticident river(10.1.3) Ice Ages (10.1.7) Gondwana Ice Age (10.1.7) Peninsular (10.1.8) Bhabar Plain (10.1.8) Bhangar Plain (10.1.8) Khadar Plain (10.1.8) Marusthali (10.1.8) Bagar (10.1.8) Consequent (10.2.2) Subsequent Drainage (10.2.2) Barbed Pattern (10.2.2) El-Nino(10.3.1) Alluvial (10.4.6) Laterite (10.4.6) Compact Settlement (10.5.1) Semi compact Settlement (10.5.1) Agricultural Productivity (10.6.5) Copping Pattern (10.6.5) crop Concentration (10.6.7) Agricultural Intensity (10.6.7) Golden Quadrilateral (10.8.1)

Advance Key Statement:

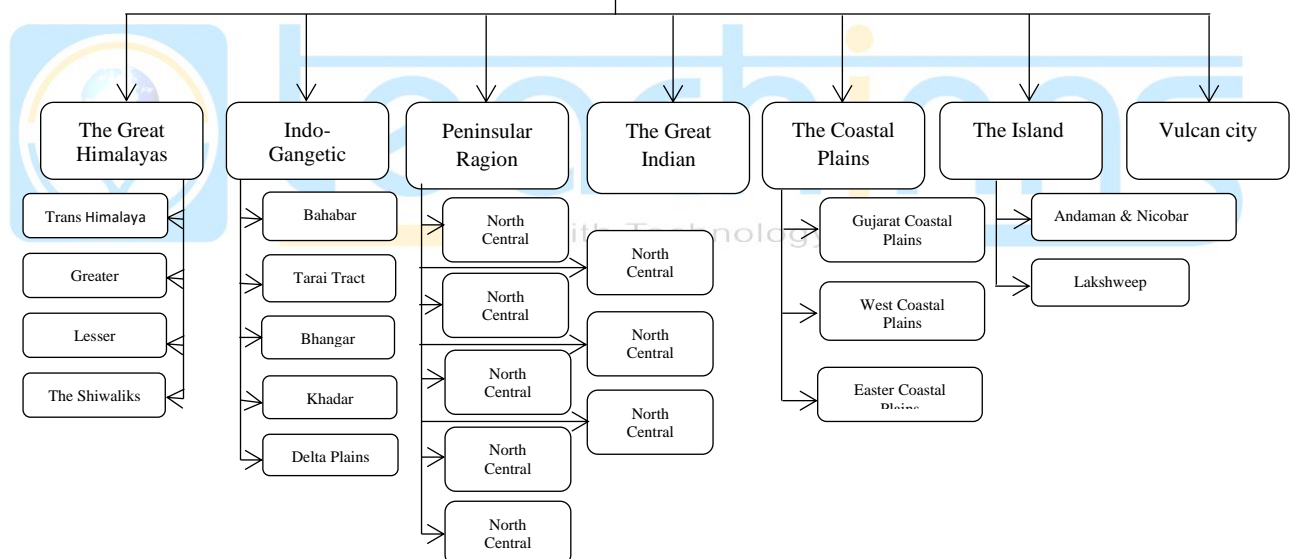
Eocenc Periods (10.1.2) Geosyncline (10.1.2) Tertiary granite (10.1.2) Dharwar Ice Age (10.1.7) Pleistocene (10.1.7) Malwa Palteau (10.1.11) South Decan (10.1.11) Rectangular Drainage (10.2.2) Radial (10.2.2) Jet Stream (10.3.2) Karewa (10.4.6) Scattered Settlement (10.5.1) Dispersed Settlement (10.5.1) Cloudburst (10.10.1)

Unit – 10

GEOGRAPHY OF INDIA

Introduction: physiography deals with the study of the surface features and landforms of the Earth. On the basis of tectonic history, stratigraphy, and physiography, India may be divided into the following physiographic divisions as shown on the map.

PHYSIOGRAPHIC DIVISIONS OF INDIA



Physiographic Divisions

10.1.2. Origin of the Himalaya: The origin of the Himalaya has been a point of contention among the geologists and geomorphologists. It is a complex mountain system having rocks from the Precambrian and Eocene periods. Mostly formed of sedimentary and metamorphic rocks, it has been subjected to intense folding and faulting. The main theories about the origin of the Himalayas are as under:

(i) The Geosynclinal Origin

The main supporters of the geosynclinal origin of the Himalaya are Argand, Kober, and Suess. According to these geologists, the disintegration of Pangaea, about 200 million years back, led to the formation of a long Tethys Sea between the Laurasian Shield (Angaraland) of the north and the Gondwanaland of the south. This sea was occupying the region of Himalaya during the Mesozoic Era (180 million years ago). At the end of the Palaeozoic and beginning of the Mesozoic Eras, the Tethys almost girdled the whole Earth running from Europe in the west to China in the east. Eroded material from the two land masses (Eurasian Shield – Angaraland and Gondwanaland) was deposited in the Tethys Sea and assumed considerable thickness due to the sinking nature of the sea bed. During the Cretaceous Period, the bed of the sea started rising which led to the folding of three successive ranges of the Himalaya. The first upheaval led to the formation of the Greater Himalaya during the Eocene Period (about 65 million years back). Similarly, the second upheaval took place during the Miocene Period (about 45 million years back) resulting in the formation of the Lesser Himalaya, and the third upheaval started in the Pliocene period (about 1.4 million years back) resulting in the formation of the Shiwaliks or the Outer Himalaya.

(ii) The Plate Tectonic Origin of the Himalaya

The theory of Plate Tectonics was put forward by W. J. Morgan of Princeton University in 1967. This theory is based on the concept of “Sea-Floor Spreading” advocated by H.H. Hess. According to this theory, about 70 or 65 million years ago there was an extensive geosyncline, called the Tethys, in place of the Himalaya. About 65-30 million years ago the Indian plate came very close to the Asian plate and started subducting under the Asian plate. This caused lateral compression due to which the sediments of the Tethys were squeezed and folded into three parallel ranges of the Himalaya. It has been estimated that this convergence has caused a crustal shortening of about 500km in the Himalayan region and is compensated by sea floor spreading along the oceanic ridge in the Indian ocean region. Since the northward movement of the Indian plate is still continuing the height of the Himalayan peaks is increasing.

10.1.3 Physiographic Divisions of the Himalaya

For a systematic study of the physiographic and relief, the Himalaya may be divided into the following four divisions from north to south:

- e) The Trans-Himalaya
- f) The Greater Himalaya
- g) The Lesser Himalaya and
- h) The Shiwaliks or the Outer Himalaya.

a) The Trans-Himalaya

The Trans-Himalaya are about 40 km wide. They contain the Tethys sediments. The rocks of this region contain fossils bearing marine sediments which are underlain by “Tertiary granite”. It has partly metamorphosed sediments and constitutes the core of the Himalayan axis. It has a great accumulation of debris in the valleys of defeated streams which could not maintain their southerly course across the rising barrier of the Himalaya.

b) The Greater Himalaya

The Greater Himalaya rise abruptly like a wall north of the Lesser Himalaya. The MCT separates the Greater Himalaya from the Lesser Himalaya. The Greater Himalaya are about 25 km wide with an average height above 6100 m (Wadia, D.N.). Almost all the lofty peaks of the Himalaya, Mt. Everest, Kanchanjunga, Nanga-Parbat, Gasherbrum, Manaslu, Dhaulagiri, Annapurna, Gosainthan, Cho-Cyu, Nanda-Devi, Kamet, Badrinath, Nanda Devi, etc., lie in this zone. The Greater Himalaya are composed of crystalline, igneous or metamorphic rocks (granite, schists, and gneiss). The basal complex of the Himalaya is Archaean. At places, due to heavy thrust, older rocks are found overlying the newer rocks. The Greater Himalaya are almost a contiguous range. The range has very few gaps mainly provided by the antecedent rivers. The Greater Himalaya receive less rainfall as compared to the Lesser Himalaya and the Shiwaliks. Physical weathering is pronounced. Erosion is, however, less effective over the Greater Himalaya as compared to the Lesser Himalaya. Being lofty, they have very little forest area.

c) The Lesser Himalaya

The width of the Lesser Himalaya is about 80 km with an average height of 1300-4600 m. It consists, generally, of unfossiliferous sediments or metamorphosed crystalline. The main rocks are slate, limestone and quartzites. Along the southern margin of the Lesser Himalaya lies the autochthonous belt of highly compressed Upper Palaeozoic to Eocene rocks, often containing volcanic material. Examples of autochthonous belts are found between Murree and Panjal thrust in Kashmir, Giri thrusts in the Shimla region and Krol and MBT in Garhwal region. This region is subjected to extensive erosion due to heavy rainfall, deforestation, and urbanisation.

d) The Shiwaliks or Outer Himalaya/Sub-Himalaya

The Shiwaliks extend from Jammu Division of Jammu and Kashmir State to Assam. In width Shiwaliks vary from 8 km in the east to 45 km in the west with an average elevation of about 900-1500m above sea level. It is not continuous range. It is broader in the west and narrows down in the east. Between the Shiwaliks and the Lesser Himalaya are longitudinal valleys called Doons/Duns. Some of the important Duns are Dehra Dun, Potli, Kothri, Kathmandu, Chumbi, and Kyarda. The Shiwaliks are mainly composed of sandstones, sand-rocks, clay, conglomerates and limestones, mostly belonging to the upper Tertiary period.

10.1.4 Longitudinal Divisions of the Himalaya

The Himalaya have also been divided by Sir S. Burrard into four divisions, namely (i) The Western Himalaya, (ii) The Kumaon Himalaya, (iii) the Nepal Himalaya, (iv) The Assam Himalaya. Prof. S. P. Chatterjee (1973), divided the Himalaya into the following six transverse divisions from west to east.

- a) The Kashmir Himalaya
- b) The Himachal Himalaya
- c) The Kumaon Himalaya
- d) The Central Himalaya
- e) The Eastern Himalaya

a) The Kashmir Himalaya

Sprawling over an area of about 350,000 sq km in the state of Jammu and Kashmir, the range stretches about 700 km in length and 500km in width. With an average height of 3000 m, it has the largest number of glaciers in India. The Ladakh region of the Kashmir Himalaya is characterized by cold desert conditions. Ladakh is one of the loftiest inhabited regions of the world (3600-4600m). the gorge of Gilgit is 5200 m in height above the sea level of the water at its bed. Surrounded by the Greater Himalaya and the Lesser Himalaya is the Kashmir Valley. Having a height of 1585 m above the sea-level, the total area of the Kashmir Valley is about 4920 sq km. It is a structural longitudinal “Dum” (D.N.Wadia). A special feature of the Vale of Kashmir is the karawa (lacustrine) deposits consisting of silt, sand and clay. These Karewas are mainly devoted to the cultivation of saffron and have orchards of apple, peach, almond, walnut and apricot. Kashmir Himalaya are characterised by high snow covered peaks, deep valleys, interlocked spurs and high mountain passes. Pirpanjal, Banihal (Jawahar tunnel), Zoji-La, Burzil, Khardungal, pensi-La, Saser-La, Lanak-la, Jara-La, Taska-La, Chang-La, Umasi-La, and Qara-Tagh-La (Karakoram) are the important mountain passes of the Kashmir Himalaya.

The Himadri: Known as the abode of gods, this section of the Himalaya has many snow capped peaks, such known as Nanga-Parbat (8119 m), Nanda Devi (7817 m), Trisul (7140 m), Nunkun (7135 m), Kamath (7756 m), etc.

b) The Himachal Himalaya

Stretching over Himachal Pradesh, it occupies an area of about 45,000 sq km. All the three ranges (the Greater, the Lesser, and Outter Himalaya) are well represented in this region. The northern slopes of the Himachal Himalaya are clothed with thick forests and show plains and lakes, while the southern slopes are rugged and forest clad. Rohtang, Bara-Lacha, and Shipki-La, are the important passes which join Himachal Pradesh with Tibet (China). The beautiful and highly productive valleys of Kangra, Kullu, Manali, Lahul, and Spiti lie in Himachal Pradesh. These valleys are well known for orchards and scenic beauty. Shimla, Dalhousie, Chamba, Dharamshala, Kullu-Manali are the important hill stations of this region.

c) The Kumaun Himalaya

The Kumaun Himalaya lie between the Satluj and the Kali rivers, stretching to a length of 320 km and occupying an area of about 38,000 sq km. Its highest peak is Nanda Devi (7817 m). Among the other peaks Kamet (7756 m), Trisul (7140 m), Badrinath (7138 m), Kedarnath (6940 m), Dunagiri (7066 m), Jaonli or Shivling (6638 m), Gangotri (6615 m), and Bandarpunch (6320 m) are important. Gangotri, Milam, and Pindar are main glaciers of Uttarakhand. The important hill stations include Mussorie, Nainital, Ranikhet, Almora, and Bageshwar. The Kumaun Himalaya are connected to Tibet by a number of passes namely, Thaga-La Muling-La (5669 m), Mana pass, Niti Pass, (5068 m), Tun-Jun-La, Shalsal Pass, Balcha Dhura, Kungrinbingri Pass, Lampiya Dhura, Mangsha Dhura and Lipu Lekh.

d) The Central Himalaya

This range stretches from river Kali to river Tista for about 800 km occupying an area of about 116,800 sq km. A major part of it lies in Nepal except the extreme eastern part called Sikkim Himalaya and in the Darjeeling District of West Bengal. All the three ranges of the Himalaya are represented here. The Highest peaks of the world like Mt. Everest (8850 m), Kanchenjunga (8598 m), Makalu (8481 m), Dhaulagiri (8172 m), Annapurna (8078 m), Manaslu (8154 m), and Gosainath (8014 m) are situated in this part of the Himalaya. It has very few passes. The passes of Nathu-La and Jelep-La (4538 m in Sikkim) connect Gangtok (Sikkim) with Lhasa (Tibet, China).

Kanchanjunga: Situated on the border of Sikkim and Tibet, it is the third highest mountain peak in the world. It is 8,598 m above sea level and remains snow covered throughout the year. Some of the important rivers of India like Kosi and Tista have their origin in this mountain.

e) The Eastern Himalaya

These lie between the Tista and the Brahmaputra rivers, covering a distance of about 720 km with an area of 67,500 sq km. The Eastern Himalaya occupy the state of Arunachal Pradesh (India) and Bhutan. In this part, the Himalaya rise very rapidly from the plains of Assam, and foothills of Shiwaliks are very narrow. The Eastern Himalaya include the Aka Hills, the Defla Hills, Miri Hills, Abor Hills, Mishmi Hills, and Namcha Barwa (7756 m). It has a number of mountain passes among which Bomdi-la, Bom La, Tunga, Yonggyap, Diphu, Pangsau, Tse-La, Debang (Arunachal Pradesh) are the most important. In the Eastern Himalaya, due to heavy rainfall, fluvial erosion is quite pronounced.

On the southern border of Arunachal Pradesh, the Himalaya take a southerly turn and the ranges are arranged in a north-south direction. Passing through the states of Arunachal Pradesh (Tirap Division) Nagaland, Manipur, Tripura, and Mizoram, the Himalaya are locally known as Purvanchal. The main hills of the Eastern Himalaya are Patkai-Bum (Arunachal Pradesh), Naga-Hills (Nagaland), Manipur Hills, Blue Mountains (Mizoram), Tripura Range, and Brail range. On the border of Nagaland and Myanmar lies the Arakanyoma. These hills are heavily forested. Northern Myanmar is connected through Diphu, Hpungan, Chaukan, Pangsau, and Likhapani (Arunachal Pradesh). Southwards, a pass joins Imphal (Manipur) with Mandalay (Myanmar). The Purvanchal is joined by the Meghalaya Plateau in the west. The extension of the Myanmar mountain chain continues southward up to Andaman and Nicobar Islands and even up to the Archipelago of Indonesia.

10.1.5 Main Mountain Passes of Himalayas

A mountain pass is a route through a mountain range or over a ridge. A pass plays a significant role in trade, war or migration.

Main Mountain passes

Name of the pass	Altitude above the sea level	Location
Aghil Pass	5000 m	Situated to the north of K2 in karakoram
Banihal Pass	2835 m	It is located in the Pir panjal ranga on NH1A that has been numbered as NH44
Bara Lacha	4843 m	Himachal Pradesh
Bomdi La	4331 m	Arunachal Pradesh. It is situated to the east of Bhutan in Greater Himalaya
Burzail Pass	Greater than 5000 m	Srinagar with Kishan-Ganga Valley
Chang-La	>5270 m	In Greater Himalayas Ladakh with Tibet
Debsa-La	5270 m	High Mountain Pass in Greater Himalayas between the Kullu and Spiti districts of Himachal Pradesh
Dihang Pass	4000 m	Situated in Himachal Pradesh
Diphu Pass		Situated in the eastern part of Arunachal Pradesh
Lmis La	>4500 m	Ladakh region of India and Tibet in China
Khardung La	>6000 m	Near Leh in China region
Khunjerab La	>5000 m	Karakoram Mountains in Ladakh

Likhapani	>4000 m	Arunachal Pradesh
Lipu Lekh		Pithoragarh district, Uttarakhand
Mana Pass	5611 m	Greater Himalayas
Mangsha Dhura Pass	5000 m	Pithoragarh district of Uttarakhand
Muling la		Situated North to Gangotri, Uttarakhand
Nathu La	4310 m	Situated at Indo-China border, Sikkim
Niti Pass	5068 m	Uttarakhand
Pangsau Pass	>4000 m	Arunachal Pradesh
Pensi La	>5000 m	Greater Himalayas
Pir Panjal Pass	3494 m	Mughal Road
Qara Tagh Pass	5540 m	Located in Karakoram Mountain
Rohtang Pass	3979 m	Eastern side of Pir Panjal Range, 51 km from Manali
Shencottah- Gap	>4300 m	Located through the Satluj Gorge
Shipki La	3930 m	Himachal Pradesh
Thang La	5359 m	Ladakh
Trill's pass	5212 m	Uttarakhand. Situated at the end of the Pindari Glacier in the Pithoragarh and Bageshwar district of Uttarakhand
Zoji La	3528 m	Kashmir (100 km from Srinagar)

10.1.6 Glaciers and Snowline

A glacier is a body of dense ice that drifts under its own weight. A glacier is formed by accumulation of snow exceeding its ablation point over many years. It is the largest reservoir of fresh water on the earth (about 75%).

Altitude of Snowline in the Himalaya

Sl.No	Himalaya Region	Altitude of Snowline
1	North Eastern Himalaya (Arunachal Pradesh)	4400 m
2	Kashmir Himalaya	5200 m to 5800 m
3	Kumaun Himalaya	5100 m to 5500 m
4	Karakoram	5500 m to above



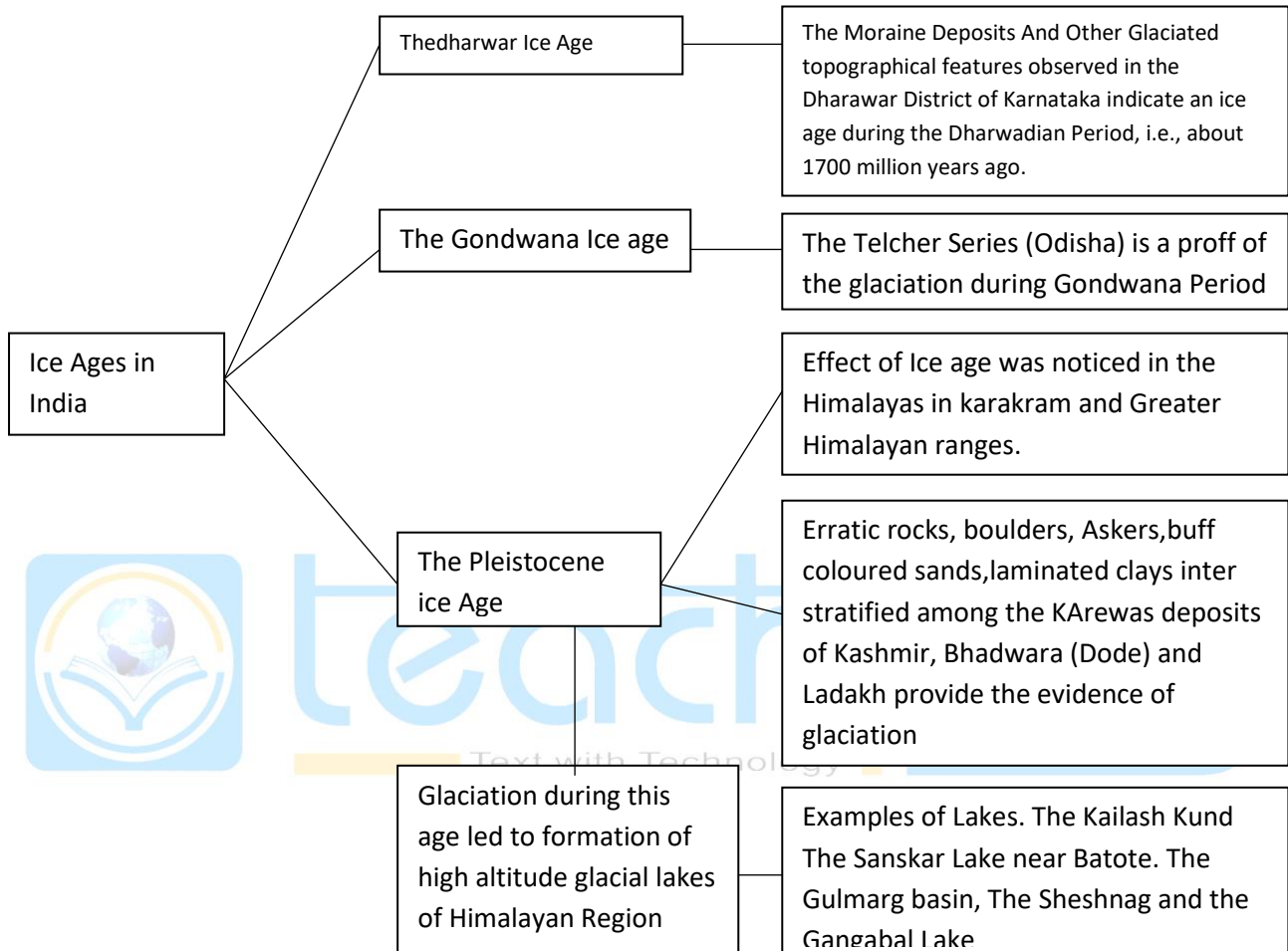
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Main Glaciers of the Himalaya Region

Name of the glacier	Location	Length (km)	Altitude (m)
Siachen	Karakoram	76	5400
Biafo	Karakoram (Baltistan region of Ladakh)	60	5128
Chogo Lungma	Karakoram	50	5016
Gangotri	Uttarakhand	28	3415
Rimo	Siachen Area of Ladakh	40	7385
Hispar	Gilgit-Baltistan	63	5128
Zemu	Sikkim/Nepal	26	
Drang Drung	Himalayan Range	23	4780
Shafat	Eastern Himalayan Range	14	4400
Sonapani	Chandra Valley of Lahaul and Spiti region	15	4000
Milam	Uttarakhand	15	22290
Rupal	Kashmir	15	
Gangri	Nun Kun Mountains; Himalayan Range	13	7135
Bara Shigri	Chandra Valley of Lahaul in Himachal Pradesh	11	-4570
Diamir (Nanga Parbat)	Kashmir (Pakistan Occupied)	11	4203
Pindari	Kumaon Region of Uttarakhand	3	3353
Chong Kumdan	Karakoram	21	7071
Hispar	karakoram	60	5128

10.1.7 Ice Ages in India

The subcontinent of India has recorded several ice ages. A brief Description of the Indian Ice Ages has been given in the following section:



10.1.8 THE GREAT PLAINS OF INDIA

The Great Plains of India lie to the south of the Shiwalik separated by the Himalayan Front fault (HFF). It is a transitional zone between the Himalaya of the north and Peninsular India of the south. It is an aggregational plain formed by the alluvial deposits of the Indus, Ganga, Brahmaputra and their tributaries. The plain stretches for about 2400 km from west to east. It has varying width, 90-100 km in Assam, 160 km near Rajmahal (Jharkhand), 200 km in Bihar, 280 km near Allahabad and 500 km in Punjab. In general, the width of the plain increases from east to west.

Origin of the Great Plains of India

There is no unanimity amongst the geologists about the origin of the Great Plains of India. The puzzling questions are related to the enormous thickness of the alluvium, nature of the depression mode of its formation, subterranean rock-beds and the underlying geological structure. Some of the important views about the origin of the Northern Plain of India have been presented briefly in the following section:

10.1.9 Physiographic

The Great Plains of India are a remarkably homogeneous surface with an imperceptible slope. In fact, they are a featureless alluvial fertile plains formed mostly by the depositional process of the Himalaya and Vindhyan rivers. These rivers deposit enormous quantity of sediments along the foothills. Beyond the foothills, the rivers deposit the alluvium in their flood plains. The Northern Plains of India may be divided into the following sub-regions:

1. The Bhabar Plain

- Location-lies to the south of the Shiwalik from west to east (Jammu Division to Assam).
- Its width is greater in the Western plains than in the eastern plains of Assam.
- Its width measures 8 to 15 km.
- Composition-Gravel and unasserted sediments deposited by the rivers descending from the Himalayan region and the Shiwaliks.
- Due to high porosity, small streams (chos and raos) disappear in the region and only big rivers flow over the surface in the tract.
- Unsuitable for crop cultivation.
- Big trees with large roots thrive in the region.
- Inhabitants are largely cattle keeping Gujjars.

2. The Tarai Tract

- Location-Lies south to the Bhabar tract and it is 15-30 km wide.
- It is wide in the eastern parts of the Great Plains in Brahmaputra region due to high rainfall.
- It is a zone of excessive dampness, thick forests, rich wild life and infested with mosquitoes.
- Once a marshy zone of jungle and wild grass along the southern edge of the Shiwaliks, Tarai has been almost reclaimed for agriculture.
- In Uttarakhand, Uttar Pradesh, Haryana, Punjab, and Jammu Division (J&K) the Tarai forests have been cleared for cultivation of crops.
- Cultivated crops include sugarcane, rice, wheat, maize, oilseeds, pulses, fodder

3. The Bhangar Plains

- They represent the upland alluvial tracts of the Great Plains of India, formed by the older alluviums.
- The Bhangar formations were deposited during the middle Pleistocene Period and it lies above the flood limits of the river.
- Its soil is dark in colour, rich in humus content and productive. It contains concretions and nodules of impure calcium carbonate or 'kankar'.
- In relatively drive areas, the Bhangar also exhibits small tracts of saline and alkaline efflorescences known as 'Reh', 'Kallar', or 'Thur'.
- Bhangar is generally a well-drained and most productive land of the Great Plains of India.
- The Bhangar deposit have the fossils of elephants, horses, man, rhinoceros, hippopotamus, etc.

4. The Khadar Plains

- The new alluvium tracts along the courses of the rivers are known as the 'Khadar' or 'Bet' lands.
- Tracts are enriched by fresh deposits of site every year during the rainy season.
- Khadar land consists of sand, silt, clay and mud. Post-independence, this region has been brought under cultivation and devoted to sugarcane, rice, wheat, maize, oilseeds, legumes, and fodder crops.
- The Khadar deposits have the fossils of living species like man, deer, oxen, buffaloes, horses, elephants, rhino, etc.

5. Delta Plains

- The deltaic plain is an extension of the Khadar land.
- It covers about 1.9 lakh sq km of area in the lower reaches of the Ganga River.
- It is an area of deposition as the river flows in this tract sluggishly.
- The deltaic plain consists mainly of old mud, new mud and marsh.
- In the delta region, the uplands are called 'Chars' while marshy areas are known as 'Bils'.
- The delta of Ganga being an active one is extending towards the Bay of Bengal.

10.1.10 Meso-regions of the Northern Plains of India

On the basis of geo-climatic and topographical characteristics, the Northern Plains of India may be divided into the following four meso-regions.

- a) The Plains of Rajasthan;
- b) The Punjab Haryana Plains;
- c) The Ganga Plains; and
- d) The Brahmaputra Plains.

a) The Plains of Rajasthan

They lie to the west of the Aravallis and include the Marusthali and the Bagar of Rajasthan. The Rajasthan plains cover a total area of about 175,000 sq km. This plain has a general slope from north-east to south-west. In the lower reaches of the Luni river (Gujarat), this plain is only 20 m above sea level. A substantial part of this plain has been formed by the recession of the sea as is evidenced by the presence of salt water lakes (Sambhar, Degana, Didwana Kuchaman, Lunkaransar-Tal, and Pachpadra). The Sambhar Lake occupying an area of about 300 sq km during the rainy season lies about 65 km to the north-west of Jaipur city.

b) The Punjab Haryana Plains

Stretching over an area of about 650 km from north-east to south-west and 300 km from west to east, the Punjab-Haryana Plain is an aggradational plain, deposited by the Satluj, Beas, and Ravi rivers. The height of the plains varies from 300 m in the north-near Jammu and Kathua to 200 m in the south-east. In the east the Delhi Ridge separates it from the Gangetic Plain. The general direction of slope is from north-east to south-west and south. The main topographical features of the Punjab-Haryana Plains are bluffs, locally called as Dhaya, as high as three metres or more, and the Khadar belts known as Bet. The undulating topography south of the Shiwaliks is adversely affected erosion, caused by seasonal streams locally called as Chos. The south western parts, especially Hissar District is sandy, characterised by shifting sand-dunes. Satluj, Beas, and Ravi are the only perinneeal rivers. Between the Satluj and the Yamuna, the Ghaggar (the ancient Saraswati) is a seasonal stream which passes through Ambala Cantt. Its course is about ten km wide and contains water only during the rainy season.

c) The Ganga Plains

The Ganga Plains lie between the Yamuna catchment in the west Bangladesh border in the east. It is about 1400 km from west to east and has an average width of 300 km from north to south. The general gradient of the plain is about 15 cm per km from north-west to south-east. The maximum height of this plain is found to the north of Saharanpur (276 m) followed by Roorkee (274 m), Agra (169 m), Kanpur (125 m), Allahabad (98 m), Patna (53 m), Kolkata (6 m), and Sagar Island only 3 m above sea level.

The main topographical variations in the plains include, Bhabar, Tarai, Bhangar, Khadar, river bluffs (levees), abandoned courses, Khols, dead-channels, Bills, Tals, and badlands.

d) The Brahmaputra Plain

Stretching over an area of about 56,275 sq km, it is the eastern part of the Great Plains of India. It is about 720 km long and about 80 km wide. The region is surrounded by high mountains on all sides, except on the west. It is a depositional plain. The general altitude of the Brahmaputra Plain varies between 130 m in the east to only 30 m in the west. The northern tributaries descending from the Arunachal and Assam Hills form a series of alluvial fans which coalesce and obstruct the courses of the tributaries forcing them to form meanders and adopt parallel course along the main stream, Brahmaputra. Consequently, there are numerous levees along the north bank. This has led to the formation of Bils, ox-bow lakes, marshy tracts, and Tarai lands with dense forest cover. The southern bank of the Brahmaputra is less uneven and less wide. Moreover, the tributaries in the southern part are considerably larger. Here Dhansiri and Kapili, through their headward erosion have almost isolated the Mikir and Rengma hills from the Meghalaya Plateau.

10.1.11

Physiography and relief features of Peninsular India :

Covering an area of about 16 lakh sq km, the peninsular upland forms the largest physiographic division of India. With a general elevation between 600-900 m, the region constitutes an irregular triangle with its base lying between the Delhi Ridge and the Rajmahal Hills and the apex formed by Kanyakumari.

1. The North Central Highlands :

The central highlands of peninsular India include the Aravallis, the Malwa Plateau, and the Vindhyan Range.

- (i) **The Aravallis:** It is a range that runs from north-east to south-west for about 800 km between Delhi to Palanpur (Gujrat). It is one of the oldest folded mountains of the world. Being highly denuded, its highest peak-Guru-Sikhar- is only 1722 m in height.
- (ii) **The Malwa Plateau:** It is bordered by the Aravallis in the north, the Vindhyan Range in the south and the Bundelkhand Plateau in the east. The Malwa Plateau has two drainage systems, one towards the Arabian Sea (Narmada and Mahi), and another towards the bay of Bengal (Chambal, Sind, Betwa, and Ken) joining the Yamuna river.

2. The South Central Highlands :

The Vindhyan Range extends from Jabat (Gujrat) and Chittorgarh (Rajasthan) to Sasaram in Bihar. It extends for about 1050 km with general elevation between the Vindhyan and the Satpura mountains.

3. The Chotanagpur Plateau :

The Chotanagpur Plateau sprawls over parts of West Bengal, Jharkhand, Chhattisgarh, Odisha, and north-eastern part of Andhra Pradesh. This Plateau has a series of the meso and micro plateaus (Ranchi, Hazaribagh, Singhbhum, Dhanbad, Palamu, Santhal, Parganas, and Purulia districts of west Bengal). It is composed of Archaean granite and gneiss rock with patches of the Cretaceous Period.

Moreover, the Chhotanagpur Plateau consists of plateaux at different levels of elevation, the highest general elevation of about 1100 m in the mid-western parts is known as pat lands.

4. The Meghalaya Plateau and Mikir Hills :

Consisting of the Garo, Khasi, Jaintia hills and the outlying Mikir and Rengma hills, it is a plateau which has been detached from the Indian Peninsula by the Malda Gap. The Meghalaya Plateau has a chequered evolutionary history of emergence, submergence, planation surface with several phases of erosion, sedimentation, diastrophism and intrusions. The Shillong Peak is the highest elevation (1823 m) in the Meghalaya Plateau, while Norkek (1515 m) is the highest Peak of the Garo Hills. Mawsynram ($25^{\circ}15'N$, $91^{\circ}44'E$) about 16 km west of Cherrapunji records the highest rainfall in the world.

5. The North Deccan (Maharashtra Plateau) :

The plateau of Maharashtra includes the entire state of Maharashtra, except the Konkan coast and the Sahyadris. It is mainly covered by the basalt of the Cretaceous Period. The basaltic sheet has a thickness of about 3 km in the western parts which diminishes towards the east and south-east. The most striking feature of the Maharashtra Plateau is the fault (1000 m), giving rise to the present shoreline of the Arabian Sea.

6. The South Deccan :

- (i) **Karnataka Plateau :** This Plateau has an average elevation of 600-900 m. Mulangiri (1913 m) is the highest peak in Baba-Budan Hills, followed by the Kudermukh (1892 m) peak.
- (ii) **The Telengana Plateau :** The plateau of Telengana consists of Dharwar and Cuddapah formations.
- (iii) **The Tamil Nadu Uplands :** This upland lies between the South Sahyadri and Tamil Nadu coastal plains. Between Coimbatore and Anaimalais, there is a board gap, known as Palakkad Gap (Palghat), about 25 km wide.

7. The Western Ghats :

The Western Ghats in Sanskrit Sahyadris run parallel to the western coast for about 1600 km in the north south direction from the mouth of the Tapi river to Kanyakumari (Cape Camorin). The average elevation of the Western Ghats varies between 1000 to 1300 m. Anaimudi is the highest peak of Sahayadris Mt. is 2695 m above the sea level.

8. The Eastern Ghats :

The Eastern Ghats form the eastern boundary of the Deccan Plateau. It is a massive outlying block of hills. The average height of the Eastern Ghats is above 600 m. The Eastern Ghat is a series of detached hills of heterogeneous composition which are called by various local names. The peak of Aroya-Konda (Andhra Pradesh) with an elevation of 1680 m is the highest peak of the Eastern Ghats

10.1.12

THE COASTAL PLAINS

The peninsular plateau of India is flanked by narrow coastal plains of varied width from north to south, known as the West-Coastal Plains and the East-Coastal Plains. These coastal plains differ from each other. They were formed by the depositional action of the river and the erosional and depositional actions of the sea waves.

According to geologist, the origin of the western and eastern coasts of India may be attributed to the faulting and subsidence of the Arabian Sea and the Bay of Bengal towards the close of the Eocene Period. Consequently, alluvial deposits along these coasts are very recent origin, ranging from Pliocene to recent times. These coastal plains have the evidence of submergence and emergence. The Indian coastal plains may be subdivided into the following three division: (i) The Gujrat Coastal Plain, (ii) The West Coastal Plain, and (iii) The East Coastal Plain.

(i) The Gujrat Coastal Plain :

The Gujrat plain covers almost the entire state of Gujrat, except the districts of Banaskantha and Sabarkantha. It is formed by the alluvial deposits of Sabarmati, Mahi, Luni, and numerous tiny parallel consequent streams. Part of this plain is the product of the winds and recession of the sea. It contains the Gondwana rock (Umia Series), resting over the marine Jurassic rock and capped by lower Cretaceous (Apatian) beds. The Deccan lava lies over the Umia series. Sahyadris in the southern side and igneous complex of the Girnar Hills (Goraknath Peak, 1117 m) and Mandev Hills in Kathiawad.

(ii) The West Coastal Plain :

It lies between the Sahyadris and the Arabian Sea. It is about 1400 km long and 10 to 80 km wide. It has an elevation up to 150m above sea level, reaching more than 300 m at places. The Western Coastal plain is characterised mainly by sandy beaches, coastal sand-dunes, mud-flats, lagoons, alluvial tracts along rivers, estuary, laterite-platforms and residual hills. The Sahyadris (elevation 750-1225 m) run parallel to the plain and present their steep face to the low lands with Thalaghaat and Bhorphat (gaps) in the north and the Palghat (Plakkad Gap) in the south of Nilgiri. The northern part of the west coastal plain, known as the Konkan Plain, is about 530 km long and 30 to 50 km wide. Southward is the Karnataka Coastal plain which is about 525 km long and 8 to 25 km wide. It is the narrowest part of the West Coastal plain. The southern part is known as the Malabar coast which is about 550 km long and 20 to 100 km wide.

The Eastern Coastal Plain :

The eastern coastal plain lies between the Eastern Ghats and the Bay of Bengal, and stretches along the coasts of Odisha, Andhra Pradesh, and Tamil Nadu. These Plains are formed by the alluvial fillings of the littoral zone comprising some of the largest deltas of the world. The Eastern Coastal plains consist mainly of recent and Tertiary alluvial deposits. These are gently, monotonous plains rising gently westwards to the foot of the eastern Ghats. The monotony of the topography is broken by the presence of numerous hills. This coastal plain has a straight shoreline with well defined beaches of sand and shingles.

10.1.13**THE INDIAN ISLANDS**

Indian Has a total of 615 island, of which 572 lies in the Bay of Bengal, and remaining 43 in the Arabian Sea. Out of the 572 islands of Andaman and Nicobar, only 36 are inhabited. The Bay of Bengal islands include the Andaman and Nicobar Islands which are largely tectonic and volcanic in origin, while the islands of the Arabian Sea are mainly coral formations. Moreover, there are a number of offshore islands along the mouth of the Ganga, eastern and western coasts and in the Gulfs of Khambat, Kachchh and Mannar.

Islands of the Bay of Bengal :

The main islands of the Bay of Bengal are the Andaman and Nicobar groups. The Andaman and Nicobar Islands are separated by the Ten Degree Channel. The shortest distance of the Andaman Islands from the mainland (Bay of Bengal Head) is about 2000 km and the extreme southern point is the Indira point- the southern most point of the Great Nicobar Island.

The Arabian Sea Islands :

There are 43 islands in the Arabian Sea, out of which only 11 are inhabited. The shortest distance form the mainland (Calicut) is about 109 km. Kavaratti, located on the island of this name is the capital of Lakshadweep. Lakshadweep islands are separated from the Maldiv Islands by the Eight degree Channel. Hills and Streams are absent on these islands.

Offshore Islands :

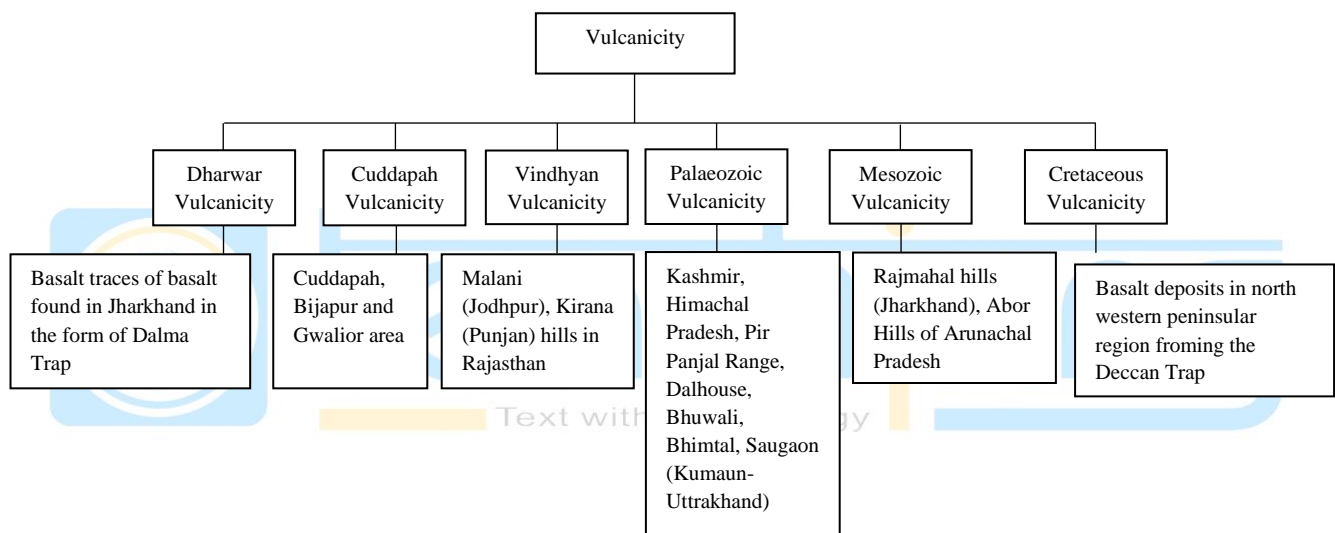
There are numerous islands in the delta region of Ganga and in the gulf of Mannar. Among the Western coast islands Piram, Bhaisala (Kathiawar), Diu, Vaida, Nora, Priotan (Priothan), Karunbhar (Kachchh coast), Khadiabet, Alibet (Narmada-Tapi mouths) Butchers, Elephanta, Karanja, cros (Near Mumbai), Bhatkal, Pegioncock, St. Mary (Mangalore coast), Anjidiv (Goa coast), Vypin near Kochi, Pamban, Crocodile, Adunda (Gulf of Mannar), Sri Harikota (mouth of pullicat lake, Pairkud (mouth of Chika Lake), Short, Wheeler (Mahanadi-Brahmani mouth), and New Moore, and Ganga-Sagar and Sagar (Ganga Delta). Many of these islands are Uninhabited and administered by the adjacent states.

10.1.14

VULCANICITY

A volcano is an opening in the crust of the earth, connected by a conduit to underlying magma chamber, from which molten lava, volcanic gases, steam, and pyroclastic materials are ejected. It is usually in the form of a peak which may be cone shaped or dome-shaped depending on the type of volcano and type of material ejected. The main causes of volcanic eruptions are associated with sea-floor spreading, plate-tectonics, and mountain building processes.

At present, the only active volcanoes in India are the Barren and Narcondom Islands (Andaman group of Islands), but geographical evidence is available for vulcanicity in the past. Prof. H.L. Chibber (1945) has identified six episodes of vulcanicity in the given as follow:



Previous Year Question**Unit – 10****Sub Unit – 1****December - 14**

1. The Pir Panjal range lies in

- (A) Outer Himalayas
- (B) Trans Himalayas
- (C) Greater Himalayas
- (D) Middle Himalayas

2. Match the following List – I with List – II and select the correct answer from the codes given :

List – I**(Mountain Range)**

- a. The Western Ghats
- b. The Eastern Ghats
- c. The Nilgiris
- d. The Aravalis

List – II**(Highest Peak)**

- i. Doddabetta
- ii. Gurusikhar
- iii. Annamudai
- iv. Deomali

Codes :

- | | (a) | (b) | (c) | (d) |
|-----|-----|-----|-----|-----|
| (A) | i | ii | iii | iv |
| (B) | iv | ii | i | iii |
| (C) | ii | iii | iv | i |
| (D) | iii | iv | i | ii |

3. Given below are two statements, one labelled as **Assertion (A)** and the other labelled as **Reason (R)**. Select the correct answer from the codes given below :

Assertion (A) : Indus and Ganges are the antecedent rivers.

Reason (R) : These rivers pass through the very narrow and deep gorges in the Himalayan mountain region.

Codes :

- (A) Both (A) and (R) are correct and (R) is the correct explanation of (A).
- (B) Both (A) and (R) are correct, but (R) is not the correct explanation of (A).
- (C) (A) is correct, but (R) is false.
- (D) (A) is false but (R) is correct.

4. Match the following **List – I** with **List – II** and select the correct answer from the codes given :

List – I	List – II
(Rivers)	(Origin)
a. Chenab	i. Great Himalaya
b. Beas	ii. Kullu Hills
c. Ganga	iii. Gangotri
d. Brahmaputra	iv. Kailas Range

Codes :

	(a)	(b)	(c)	(d)
(A)	i	ii	iii	iv
(B)	i	iii	ii	iv
(C)	ii	iii	i	ii
(D)	iv	iii	i	ii

5. Match the following **List – I** with **List – II** and select the correct answer from the codes given :

List – I	List – II
(Plateau)	(States)
a. Bhandar	i. Chhatisgarh
b. Ranchi	ii. Madhya Pradesh
c. Bastar	iii. Jharkhand
d. Shillong	iv. Meghalaya

Codes :

	(a)	(b)	(c)	(d)
(A)	i	ii	iii	iv
(B)	i	iii	iv	ii
(C)	ii	iii	i	iv
(D)	ii	i	iii	iv

Answer with Reference

SL. NO.	QUESTION NO.	ANSWER	REFERENCE NO.
1.	41	C	10.1.3
2.	57	D	10.1.11
3.	61	B	10.1.3
4.	62	A	10.1.3,10.1.4
5.	64	C	10.1.11



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December - 15

1. Which one of the following passes connects Arunachal Pradesh with Tibet ?

- (A) Aghil
- (B) Bom - Di La
- (C) Banihal
- (D) Changla



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Text with Technology

Answer with Reference

SL. NO.	QUESTION NO.	ANSWER	REFERENCE NO.
1.	44	B	10.1.5



teachinns
Text with Technology

July - 16

1. Which one of the following plateaus lies between Aravali and Vindhyan ranges ?

- (A) Chhota Nagpur
- (B) Deccan
- (C) Malwa
- (D) Both (2) and (3)

2. Which of the following mountain ranges does not emerge from the Pamir Knot ?

- (A) Hindu Kush
- (B) Zagros
- (C) Tienshan
- (D) Kunlun

3. Which one of the following sequences of physical features is correct ?

- (A) Mountain, Tarai, Plain and Bhabhar
- (B) Plain, Bhabhar, Tarai and Mountain
- (C) Mountain, Plain, Bhabhar and Tarai
- (D) Plain, Tarai, Bhabhar and Mountain

4. Match **List – I** with **List – II** and select the correct answer using the codes given below :

List – I**(Hill Name)**

- I. Mikir Hills
- II. Amarkantak
- III. Khasi Hills
- IV. Baba Budan Hills

List – II**(State Name)**

- A. Madhya Pradesh
- B. Assam
- C. Karnataka
- D. Meghalaya

Codes :

(a) (b) (c) (d)

- (A) ii iii i iv
- (B) iv i iii ii
- (C) ii i iv iii
- (D) iv iii ii i

Answer with Reference

SL. NO.	QUESTION NO.	ANSWER	REFERENCE NO.
1.	43	C	10.1.11
2.	64	B	10.1.2,10.1.3
3.	64	D	10.1.9
4.	66	C	10.1.4



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January - 17

1. Which one of the following regions separates the Great Plains of North India from the plateaus and coastal plains of the Deccan ?

- (A) Central Highlands
- (B) Western Himalayas
- (C) Eastern Himalayas
- (D) Western Arid Plains

2. Given below are two statements, one labelled as **Assertion (A)** and other labelled as **Reason (R)**. Select your answer from the codes given below :

Assertion (A) : The Tarai region represents a marsh like landscape.

Reason (R) : The Tarai region is a zone of seepage where the fine sand, silt and clay are deposited by the emerging streams.

Codes :

- (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 true, but (R) is false.
- (D) (A) is false, but (R) is true.

3. Which one of the following statements is correct ?

- (A) One Himalayas were formed due to faulting of the earth's crust.
- (B) Himalayas are the oldest mountains.
- (C) Himalayas belong to the Caledonian mountain system.
- (D) Himalayas have risen from the Tethys Sea when the sea got compressed.

4. The oldest rocks in India are reported from

- (A) Siwalik range
- (B) Aravali range
- (C) Dharwar region
- (D) Vindhyan range

5. Match **List-I** with **List-II** and select the correct answer from the codes given below :

List-I	List-II
(Pass)	(State)
I. Shipki-la	A. Arunachal Pradesh
II. Niti	B. Himachal Pradesh
III. Nathu-la	C. Uttarakhand
IV. Bomdi-la	D. Sikkim

Codes :

	(a)	(b)	(c)	(d)
(A)	i	ii	iii	iv
(B)	iii	i	ii	iv
(C)	ii	iii	iv	i
(D)	iv	ii	I	iii



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Answer with Reference

SL. NO.	QUESTION NO.	ANSWER	REFERENCE NO.
1.	36	A	10.1.11
2.	44	A	10.1.9
3.	45	D	10.1.2
4.	63	C	10.1.7
5.	64	C	10.1.5



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November - 17

1. Which one of the following passes connects Arunachal Pradesh with Tibet ?

- (A) Banihal Pass
- (B) Chang La Pass
- (C) Bom Dila Pass
- (D) Aghil Pass

2. Match List - I with the List - II and select the correct answer from the code given below :

List - I

(Mountains/Ranges)

- (a) Nilgiri
- (b) Satpura
- (c) Aravalli
- (d) Himalaya

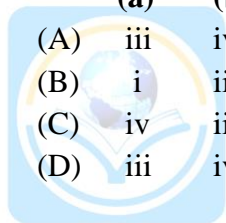
List - II

(Peaks)

- (i) Sagarmatha
- (ii) Mt. Abu
- (iii) Dhupgarh
- (iv) Dodabetta

Code :

- | | (a) | (b) | (c) | (d) |
|-----|-----|-----|-----|-----|
| (A) | iii | iv | i | ii |
| (B) | i | ii | iii | iv |
| (C) | iv | ii | ii | i |
| (D) | iii | iv | ii | i |



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Answer with Reference

SL. NO.	QUESTION NO.	ANSWER	REFERENCE NO.
1.	43	C	10.1.5
2.	66	C	10.1.11,10.1.4



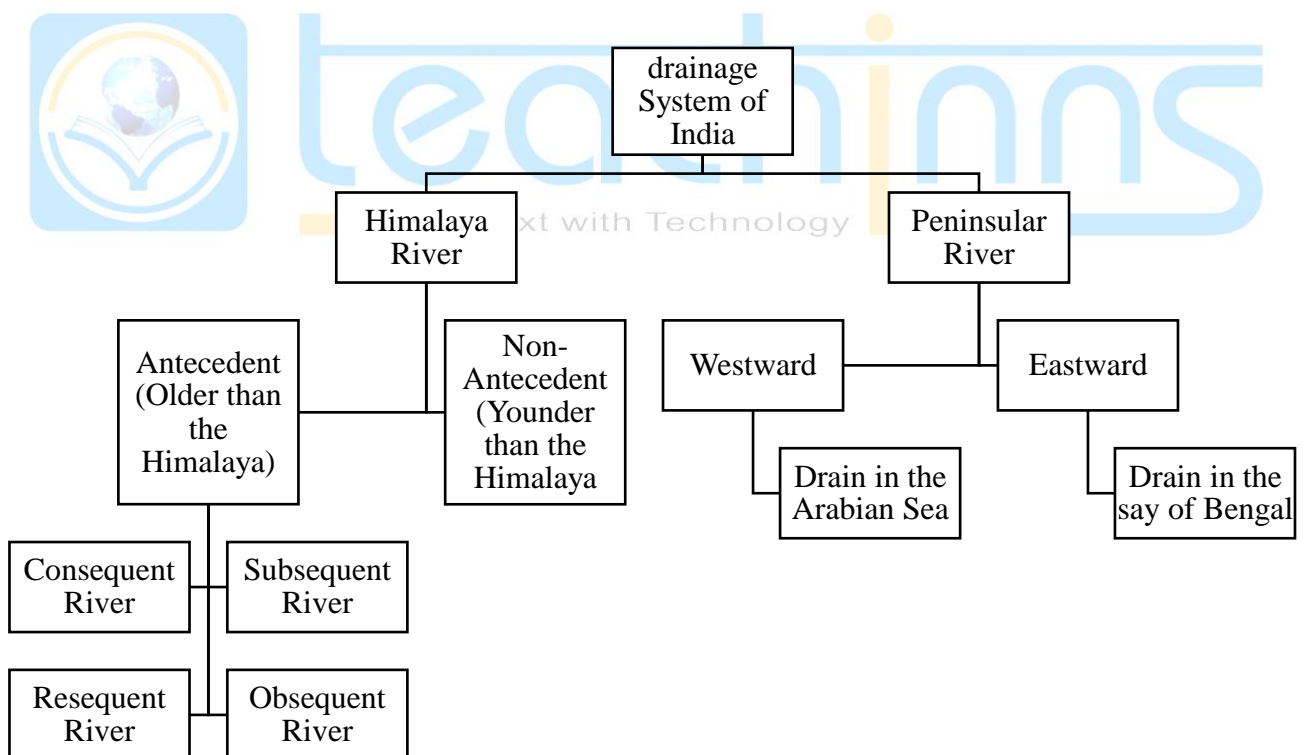
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SUB –UNIT-2

10.2.1 : The Drainage System of India

The drainage system is an integrated system of tributaries and a trunk stream which collect and funnel surface water to the sea, lake or some other body of water. The total area that contributes water to a single drainage system is known as a 'Drainage basin'. This is a basic spatial geomorphic unit of a river system distinguished from a neighboring basin by ridges and highlands that form divides. Thus, river basins are natural units of land. They are regarded as the fundamental geomorphic as well as hydrological units for a systematic study of the river basins, mainly due to the following three reasons :-

- They can be placed in an orderly hierarchy.
- They are areal units whose geomorphological and hydrological characteristics can be measured quantitatively, and
- They can be treated as working system with energy input of climatological variables like temperature and rainfall and output of river discharge as runoff.



10.2.2 : Drainage patterns :

A geometric arrangement of streams in a region; determined by slope, differing rock resistance to weathering and erosion, climate, hydrologic variability and structural controls of the landscape is known as a 'Drainage Pattern'. In other words drainage pattern refers to a design which a river and its tributaries form together, from its source to its mouth. The factors controlling the pattern of drainage in a region include the topography, slope, structural control, nature of all, the tectonic activities, supply of water and above the following types of drainage patterns are found :

1. The Antecedent or Inconsequent Drainage :

The river that existed before the upheaval of the Himalayas and cut their courses southward by making gorges in the mountains are known as the antecedent river. The Indus, Satluj, Ganga, Sarju (Kali), Arun (a tributary of Koshi), Tista and Brahmaputra are some of the important antecedent rivers originating from beyond the greater Himalayas.

- i) **Consequent River** : The rivers which follow the general direction of slope are the Consequent Rivers. Most of the rivers of peninsular India are consequent rivers. For example, river like Godavari, Krishna, and Kaveri.
- ii) **Subsequent Rivers** : A tributary stream that is eroded along the main an underlying belt of non-resistant rock after the main drainage pattern (Consequent Rivers) has been established is known as a Subsequent river. The Chambal, Sind, Ken, Betwa, Tons, and Son meet the Yamuna and the Ganga at right angles.
- iii) **Resequent Rivers** : It flow in the same direction as of the initial consequent stream. However, it develops in response to a new base level. They originate during the initiation of the cycle of erosion in a folded structure. Their origin is recent and thus they are called Resequent.
- iv) **Obsequent River** : It is formed when it adjusts itself to some rock structure. An Obsequent River may form perpendicularly to the subsequent stream. It flows opposite to the direction of flow of the original consequent stream. The northward flowing streams of the lesser Himalaya join the subsequent stream Sun Kosi as obsequent streams. The direction is opposite to that of Ganga and the Yamuna.

2. Superimposed, Epigenetic (Discordant) or Superinduced Drainage :

It is formed when a stream with a course originally established on a cover of rock now removed by erosion, so that the stream or drainage system is independent of the newly exposed rock and structures. In other words, it is a drainage pattern which exhibits discordance with the underlying rock structure because it originally developed on a cover of rocks that has now disappeared due to denudation.

3. dendritic Drainage or Tree-like pattern :

A term used for drainage which is branching, ramifying or dichotomizing, there by giving the appearance of a tree. Thus, a dendritic pattern develops in a terrain which has uniform lithology, and where faulting and jointing are insignificant; e.g., massive crystalline rocks or thick plains consisting of clays. Most of the river of the Indo-Gangetic plains are of dendritic type.

4. Trellis Drainage :

Trellis drainage pattern is characteristic of folded topography. This pattern exists in nearly parallel mountains, where drainage pattern are influenced by rock structures of variable resistance and fold straight. In a trellis drainage pattern, tributaries are arranged in a pattern similar to that of a garden trellis.

5. Barbed Pattern :

A pattern of drainage in which the confluence of a tributary with the main river is characterized by a discordant junction as if the tributary intends to flow upstream and not downstream.

6. Rectangular Drainage : A rectangular pattern is formed by a faulted and jointed landscape, directing stream courses in patterns of right angled bends and right-angled junctions between tributaries and the main stream is known as rectangular drainage.

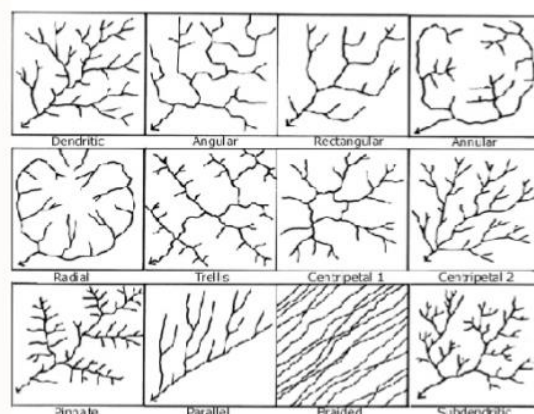
7. Radial Pattern :

Radial pattern of drainage results form streams flowing of a central peak or dome. It is a pattern characterized by out flowing rivers, away form a central point, analogous with the spokes of a wheel. It tends to develop on the flanks of a dome or a volcanic cone.

8. Parallel Drainage :

The drainage pattern in which the rivers flow almost parallel to each other is known as parallel drainage.

Drainage Pattern



10.2.3

SL. No.	Type of drainage	Example of drainage
1.	Superimposed/Epigenetic/Superinduced	The Damodar, the Subarnarekha, the Chambal, the Banas and the rivers flowing at the Rewa Plateau.
2.	Dendritic or tree-like pattern	Rivers of Indo-Gangetic plains
3.	Trellis	Rivers in mountains of Singhbhum (Chotanagpur Plateau).
4.	Barbed	The Arun river (Nepal)-Tributary of river Kosi
5.	Rectangular	Found in Vindhyan mountains.
6.	Radial	In Girnar Hills(Kathiawar, Gujarat) and Mikir Hills of Assam.
7.	Parallel	Surya, Kalu, Savitri in Maharashtra, Sai, Zuvari, Talpona in Goa, Kalinadi and Sharavati in Karnataka, Periyar, Pamba in Kerala.
8.	Annular	Pithoragarh (Uttarakhand), Nilgiri Hills(Tamil Nadu), Kerala
9.	Deranged	Found in glaciated valleys of Karakoram.

10.2.4 : The Himalayan Drainage :

The Himalayan drainage system comprises all the international rivers of Indian, i.e., the Indus, the Ganga, and the Brahmaputra. Most of these rivers and their major tributaries are perennial in character, obtaining their water from the glaciers and rains. These rivers are in their youthful stage carving out a number of erosional land-forms like waterfalls, cataracts, rapids, gorges, steep slopes, and rivers terraces. The Himalayan rivers are not only eroding agents. But are depositing agents in the plains and deltas. The great Himalayan rivers (Indus, Satluj, Ganga, Kali, Karnali, Kosi, Tista and Brahmaputra) are older than the greater Himalayas. They are antecedent and drain not only the southern slopes of the Himalayas but to a large extent, the northern Tibetan slope as well.

10.2.5 : Major Rivers of The Himalayan Region :

River	Source	Length(km)	Main Tributaries
The Indus	Glacier bokharchu in the mt. Kailash	2880	Jhelum, Chenab, Ravi, Beas, Satluj
The Jhelum	Chashma verinag in the Kashmir Valley	725 km but in India it is 165 km	Sandran river, Bringi river, Arioath, Rambhara stream, Nallah Lidder, Nallah Sindh, Nallah Vishnu, Dudhganga river, Pohore.
The Chenab (Chandra-bhaga)	Lahaul Valley of Himachal Pradesh	960	Stream Chandra, Stream Bhaga, The Mivir Nallah, The Bhut Nallah, The Marusudar, The Tawi River, The Niru.
The Ravi	Near Rohtang	725	River Bhadal, River Siu, River Baira, River Tanti Gari.
The Beas	Beas Kund near Rohtang pass	460	Bain, Bangana, Luni, Uhai, Banner, Chakki, Gaj, Harla, Mamuni, Parvati, Patlikuhlai, Sainj, Suketi, Tirthan
The Satluj	Manasarovar-Rakas lakes	1450km in total and 1050 km in India	Baspa, Spiti, Nogli Khad, Soan
The Ganga (Bhagirathi)	Gangotri glacier in Garhwal, Himalaya	2525	Gomti, Ghaghara, Gandaki, Kosi, Yamuna, Son, Punpun, Damodar
The Yamuna	Yamunotri glacier near Bandarpunch peaks in The Mussoorie	1376	Tons, Ghambal, Hindon, Betwa, Ken, Giri, Sind, Uttanagar, Sengar, Rind.
The Brahmaputra	Kailash Ranges	2900	Lohit, Dibang, Subansiri, Jia Bharali, Dhansiri, Manas, Torsa, Sankosh, Teesta, Desang, Dikhow.

10.2.6 : Major Rivers of Peninsular India

River	Source	Length (km)	Main Tributaries
Godavari	Trimbak plateau near Nasik (Maharashtra)	1465	Sabari, Indravati, Penganga, Wardha, Pranhitha, Purna, Wainganga, Manjra, Trina, Pranhita, Moher
Krishna	Near Mahabaleshwar (Maharashtra)	1400	Musi, Muneru, Koyna, Nira, Muthumula, Sina, Kagna, Bhima, Ghataprabha, Malprabha, Nira, Panchganga, Dudhganga, Tungbhadra.
Narmada	Amarkantak	1310	Heran, Orsang, Barna, Kolar, Burknar, Banjar, Shar, Sakkar, Dudhi, Tawa, Kundi
Kaveri	Taal Kaveri	800	Herangi, Hemavati, Yogachi, bhavani, Novil, Amaravati, Sanmukta, Nanganji, Laxman-Tiratha, Suvarnavati, Turunananimutta.
Mahanadi	Dandakarnya Plateau near Raipur	875	Id, Mand, Hasdeo, Seonath, Ong, Jonk, Tel
Tapi	Multai in Betul Distt.(MP)	730	Purna, Girna, Panjhra, Betul, Patki, Arunavati, Ganjal, Dhatranj, Aner, Bokad, Mon, Guli

10.2.7 : Main Lakes of India

- 1. Ashtamudi Lake (Astamudi Kayal)** – It is a lagoon in the kollam District of Kerala.
- 2. Bhimtal** – Situated near the town of Bhimtal in Kumaun Division of Uttarakhand.
- 3. Bhoj Wetland** – Located in the city of Bhopal(Capital of Madhya Pradesh).
- 4. Chandra Tal** – It is a high altitude lake in Lahaul and Spiti district of Himachal Pradesh.
- 5. Chembarambakkam Lake** – It is located in the Chengalpattu district of Tamil Nadu
- 6. Chilka Lake** – Situated in the state of Odisha.
- 7. Dal Lake** – Dal is a famous lake in Srinagar.
- 8. Dhebar Lake** – Situated in the state of Rajasthan.
- 9. Himayat Sagar** – Located at a district of 20km form the ,city of Hyderabad.
- 10. Hussain Sagar** – Hussain Sagar is in the city of Hyderabad.
- 11. Kaliveli Lake** – It is a coastal lake in the district of Viluppuram in Tamil Nadu.
- 12. Khajjiar Lake** – Located in the Chambal district of Himachal Pradesh.
- 13. Khecheopalri Lake** – It lies in West Sikkim.
- 14. Kolleru Lake** – Situated in Andhra Pradesh.
- 15. Loktak Lake** – It is the largest fresh water lake in north-east India.
- 16. Nako Lake** – Situated in the district of Kinnaur (Himachal Pradesh).
- 17. Osman Sagar** – It is an artificial lake in Hyderabad.
- 18. Pongong Tso** – Pong Tso is an endorheic Lake that is situated in Ladakh.
- 19. Pulicat Lake** – It is the Second largest brackish water lake on the coromandel coast.
- 20. Pushkar Lake** – Situated in the district of Ajmer it is an artificial lake.
- 21. Renuka Lake** – Situated in the Siarmaur district of Himachal Pradesh.
- 22. Roopkund** – Situated in Uttarakhand.
- 23. Sambhar Lake** – Situated about 70 km to the West of Jaipur city, it is the largest salt lake of India.

- 24. Sasthamkotta lake** – It is a large fresh water lake in Kerala State.
- 25. Satta or Sat Tal** – It is the calm, quiet group of seven lakes near Bhimtal town of the Kumaun division of Uttarakhand.
- 26. Suraj Tal** – Located below the summit of The Baralacha pass.
- 27. Chandra Tal Lake** – It is located in Spiti district of Himachal Pradesh.
- 28. Tawa Reservoir** – Located in Hoshingabad on the River narmada (MP)
- 29. Tsongmo Lake** – Situated in the state of Sikkim.
- 30. Veeranam Lake** – Cuddalore district of Tamil Nadu.
- 31. Veeranpuzha Lake** – Located in Kochi.
- 32. Vembanattu Lake** – About 16 km from Kottayam.
- 33. Wular Lake** – Situated in the Valley of Kashmir between Sopore and Bandipore.
- 34. Vembanad Lake** – It is the Largest lake in Kerala.



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10.2.8 : Some Important waterfalls of India :

State	Name of the Waterfalls
Chhattisgarh	Teerathgarh
Madhya Pradesh	Dhunwadhar (River Narmada, Near Jabalpur)
Himachal Pradesh	Bundla and Palani Falls
Jharkhand	Ghagri, Hundru, Johna Falls
Karnataka	Abbey Falls, Arisina Gundi Falls, Hebbe Falls, Irupu Falls, Kalhatti Falls, Keppa Falls, Koosali Falls, Kudumari Falls, Kunchikal Falls, Magod Falls, Mekedaalu Falls, Muthyala Falls, Sathodi Falls, Simsa falls, Chunchi Falls, Unchalli Falls.
Kerala	Athirappilly Falls, Meenmutty Falls, Palaruvi Falls, Soochipara Falls, Thusharagiri Falls.
Maharashtra	Chchi Falls, Gatha Falls, Keoti Falls, Kune Falls, Marleshwar Falls, Pandavgat Falls.
Meghalaya	Beogon Falls, Bishop Falls, Elephant Falls (Shillong peak), Kynrem Falls, Langshiang Falls, Margaret Falls, Nohkalikai Falls, Spread Eaglo Falls, Sweet Falls.
Mizoram	Vantawng Falls
Odisha	Joranda Falls, Khandadhar Falls near Bugada.
Tamil Nadu	Aintharvi (Five Falls), Beman Falls (Palani Hills), Bear Shola Falls (Kotagiri), Chitraruvi Falls (Small falls), Courtallam Falls, Eik Falls, (Palani Hills National Park), Vaideki falls, Thakkam Thootam Falls (Near Palani), Thenaruvi Falls (Honey Falls), Pazhaya Counallam Falls (Old Falls), pykara Falls (Nilgiri), Neptune Falls (In Palani National park), Pull Aruvi (tiger Falls), Puthu Aruvi (New Falls-Milk-falls), Suruli Falls(Near Madurai)

10.2.9: Irrigation :

Irrigation in India include network of major and minor canals from Indian rivers, ground water well based system, tanks and other Rain water harvesting project for agricultural activities. Of the ground water system is the largest. In 2013-2014 only about 36.7% of total agricultural land in India was reliably irrigated and remaining 2/3rd cultivated land in India is dependent on monsoons. 65% of the irrigation in India is from ground water. Currently about 51% of the agricultural area cultivating food grains is covered by irrigation. The rest of the area is dependent on rainfall.

Canal Irrigation :

Most of the canal irrigation is in the canal network of Ganga-Jamuna Basin mainly in the states of Punjab, Haryana and Uttar Pradesh and somewhat in Rajasthan and Bihar while small local canal networks also exist in the south in Tamil Nadu, Karnataka and Kerala, etc. The largest canal in India is Indira Gandhi canal, which is about 650 km long.



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PREVIOUS YEAR QUESTIONS**Sub Unit – 2****December - 14**

1. Match **List – I** with **List – II** and select the correct answer using the codes given below :

List – I	List – II
(Major Rivers)	(Tributaries)
a. Vaigai	i. Tista
b. Cauvery	ii. Yamuna
c. Brahmaputra	iii. Suruli
d. Ganga	iv. Amaravati

Codes :

	(a)	(b)	(c)	(d)
(A)	i	iii	iv	ii
(B)	iii	iv	ii	i
(C)	iii	iv	i	ii
(D)	i	iii	ii	iv

2. Match the following **List – I** with **List – II** and select the correct answer from the codes given :

List – I	List – II
(Modern name of River)	(Name of River in Rig Veda)
a. Sutlej	i. Lauhitya
b. Brahmaputra	ii. Sindhu
c. Indus	iii. Vitasta
d. Jhelum	iv. Sutudri

Codes :

	(a)	(b)	(c)	(d)
(A)	iv	ii	iii	i
(B)	iv	i	ii	iii
(C)	ii	iii	iv	i
(D)	iv	ii	i	iii

Answer with Reference

SL. NO.	QUESTION NO.	ANSWER	REFERENCE NO.
1.	42	C	10.2.5,10.2.6
2.	28	B	10.2.5,10.2.4



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June - 15

1. Teesta river is a tributary of :

- (A) Subansiri
- (B) Meghna
- (C) Ganga
- (D) Brahmaputra

2. Where is Govind Sagar Lake located ?

- (A) Ranjit Sagar Dam
- (B) Hirakund Dam
- (C) Kosi Dam
- (D) Bhakra Nangal Dam

3. The maximum % share of irrigated area of the gross cultivated area is found in :

- (A) Jammu and Kashmir
- (B) Uttar Pradesh
- (C) Punjab
- (D) Haryana

4. Kakrapar irrigation project is on the river :

- (A) Narmada
- (B) Godavari
- (C) Tapi
- (D) Mahanadi

5. The river Indus Originates from :

- (A) Mansarovar Lake
- (B) Kailash range
- (C) Loktak lake
- (D) Tibet

6. Which of the canal has transformed agricultural activities of Sri Ganga Nagar, Bikaner and Jaisalmer districts ?

- (A) Kankar Canal
- (B) Ram Ganga Canal
- (C) Sarda Canal
- (D) Indira Gandhi Canal

Answer with Reference

SL. NO.	QUESTION NO.	ANSWER	REFERENCE NO.
1.	42	D	10.2.5
2.	61	D	10.2.7
3.	62	C	10.2.9
4.	63	C	10.2.6
5.	64	B	10.2.5
6.	66	D	10.2.9



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December - 15

1. The main river flowing in the state of Jammu and Kashmir is :

- (A) Jhelum
- (B) Chenab
- (C) Indus
- (D) Nubra

2. The Rajasthan Canal (Indira Gandhi Canal) draws its water from the rivers :

- (A) Yamuna river
- (B) Chambal river
- (C) Ravi
- (D) Satluj and Beas



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Answer with Reference

SL. NO.	QUESTION NO.	ANSWER	REFERENCE NO.
1.	41	C	10.2.4
2.	62	D	10.2.9



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July - 16

1. In which state of India Subansiri Hydropower Project is located?

- (A) Manipur
- (B) Meghalaya
- (C) Arunachal Pradesh
- (D) Tamil Nadu

2. Match **List-I** with **List-II** and select the correct answer using codes given below.

List – I	List – II
(Rivers)	(Tributaries)
I. Krishna	A. Chambal
II. Brahmaputra	B. Indravathi
III. Godavari	C. Tista
IV. Yamuna	D. Bhima

Codes :

	(a)	(b)	(c)	(d)
(A)	iv	iii	ii	i
(B)	iii	iv	ii	i
(C)	iv	iii	i	ii
(D)	i	iv	iii	ii

3. Match **List – I** with **List – II** and select the correct answer using the codes given below :

List – I	List – II
(River Name)	(Urban Settlement)
I. Ganga	A. Vijayawada
II. Krishna	B. Tezpur
III. Brahmaputra	C. Kanpur
IV. Mahanadi	D. Cuttack

Codes :

	(a)	(b)	(c)	(d)
(A)	i	ii	iii	iv
(B)	iii	ii	i	iv
(C)	iii	I	iv	ii
(D)	iii	I	ii	iv

Answer with Reference

SL. NO.	QUESTION NO.	ANSWER	REFERENCE NO.
1.	44	C	10.2.5
2.	68	A	10.2.5,10.2.6
3.	67	D	10.2.5,10.2.6



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January - 17

1. Select the correct sequence of the Eastward flowing rivers of peninsular India from North to South :

- (A) Subarnarekha, Krishna, Mahanadi, Godavari, Cauvery, Vaigai, Pennar
- (B) Subarnarekha, Mahanadi, Godavari, Krishna, Pennar, Cauvery, Vaigai
- (C) Mahanadi, Godavari, Subarnarekha, Krishna, Cauvery, Vaigai, Pennar
- (D) Godavari, Subarnarekha, Krishna, Pennar, Vaigai, Cauvery, Mahanadi



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Answer with Reference

SL. NO.	QUESTION NO.	ANSWER	REFERENCE NO.
1.	66	B	10.2.6



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November - 17

1. Match **List - I** with the **List - II** and select the correct answer from the code given below :

List - I (Hydel Power Projects)	List - II (States)
(a) Sharavathi	(i) Odisha
(b) Balimela	(ii) Uttar Pradesh
(c) Obra	(iii) Karnataka
(d) Shanan	(iv) Punjab

Code :

	(a)	(b)	(c)	(d)
(A)	i	iii	iv	ii
(B)	ii	iii	iv	i
®	ii	iv	®	iii
(D)	iii	®	ii	iv

D. Given below are two statements, one labelled as **Assertion (A)** and the other labelled as

Reason ®. Select your answer from the code given below :

Assertion (A) : Northern part of Ganga plain has very few irrigation canals.

Reason ® : This area receives high rainfall and has plenty of underground water.

Code :

- (A) Both (A) and ® are true and ® is the correct explanation of (A).
(B) Both (A) and ® are true , but ® is not a correct explanation of (A).
® (A) is true, but ® is false.
(D) (A) is false, but ® is true.

Answer with Reference

SL. NO.	QUESTION NO.	ANSWER	REFERENCE NO.
1.	63	D	10.2.9
2.	64	B	10.2.4



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July - 18

1. Match the **List - I** with **List - II** and select the correct answer from the code given below :

List - I (Name of Dams)	List - II (States)
(a) Mayurkashi	(i) Tamil Nadu
(b) Mettur	(ii) Andhra Pradesh
(c) Nagarjunsagar	(iii) Odisha
(d) Hirakund	(iv) West Bengal

Code :

	(a)	(b)	(c)	(d)
(A)	(iv)	(i)	(ii)	(iii)
(B)	(i)	(ii)	(iii)	(iv)
(C)	(iv)	(iii)	(ii)	(i)
(D)	(iii)	(ii)	(iv)	(i)



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Answer with Reference

SL. NO.	QUESTION NO.	ANSWER	REFERENCE NO.
1.	83	A	10.2.9



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SUB UNIT-3

Climate of India

Introduction

The climate of India is essentially sub-tropical monsoonic. The word “monsoon” has been derived from the Arabik word “mausim” which means “season”. Originally, the word monsoon was used by Arab navigators several centuries ago, to describe a system of seasonal reversal of winds along the shores of the Indian Ocean, especially over the Arabian Sea, in which the winds blow from the south west to north east during the summer season and from the north east to south west during the winter season.

10.3.1

INDIAN MONSOON

Monsoon are a complex meteorological phenomenon. Experts of meteorology have developed a number of concepts about the origin of monsoons.

(i) The Thermal Concept of Halley

Halley a noted astronomer in 1686 hypothesized that the primary caused of the annual cycle of the Indian monsoon circulation was the differential heating effects of the land and the sea. According to this concepts monsoons are the extended land breeze and sea breeze on a larz scale, produced by the differential heating of continents and ocean basins.

(ii) The Dynamic Concept by Flohn

The dynamic concept about the origin of monsoon was put forward by Flohn in 1951. According to this concept, monsoon is the result of seasonal migration of planetary winds and pressure belts. The inter-Tropical Convergence Zone (ITCZ) is formed due to the convergence of north east and south east trade winds near the equator. The northern and the southern boundaries of the ITCZ are called NITC (Northern inter tropical convergence) and SITC (southern inter tropical convergence), respectively. There is a belt of doldrums within the Inter Tropical Convergence, characterized by equatorial westerlies. At the time of the summer solstice (21th June), when the sun's rays are vertical over the Tropic of cancer, the NITC is extended up to 30°N latitude, covering south and south east Asia. Thus, equatorial westerlies are established over these areas. The equatorial westerlies become south west or summer monsoons.

(iii) Recent Concepts about the origin of Indian Monsoon

During the Last five decades, the upper atmospheric circulation has been studied significantly, as a result of which meteorologists have raised certain doubts about the validity of the classical concept of the origin Indian monsoon. It is now believed that the differential heating of land and sea cannot produce the monsoon circulation. More recent theories have laid greater emphasis on the circulation in atmosphere over the subcontinent and the adjoining areas. Apart from the upper atmospheric circulation, recent concepts rely heavily on the role of the Tibetan Plateau, jet streams, and the El-Nino(Southern Oscillation).

The data gathered by meteorologists after the second World War have revealed that the origin and mechanism of monsoons are related to the following phenomena:

- (i) The role of the Himalayan and Tibetan Plateau as a physical barrier and a source of high-level heat.
- (ii) The circulation of upper air streams in the troposphere.
- (iii) The existence of upper air circum-polar whirl over north and south poles in the troposphere.
- (iv) The differential heating and cooling of the huge landmass of Asia and the Indian and the Pacific Ocean.
- (v) The occurrence of El-Nino in the south Pacific and Indian Ocean.

10.3.2

JET STREAM AND INDIAN MONSOON

Jet stream is the most prominent movement in upper level westerly wind flows irregular concentrated meandering bands of geostrophic wind travelling at a speed of 300 to 400 kmph. The jet streams are high altitude (9000 to 12000 m) westerly winds between middle latitudes (summer $35^{\circ}N$ to $45^{\circ}N$; winter $20^{\circ}N - 35^{\circ}N$) in the Northern Hemisphere. Recent researches have shown that these winds exert considerable impact on surface weather conditions.

The influence of jet streams on the origin and development of Indian monsoons may be appreciated from the following description of weather phenomena during the summer and the winter seasons. The upper air westerly jet streams are extended up to $20^{\circ}N - 35^{\circ}N$ (Nagpur, Raipur latitudes) due to equator-ward shift of upper air north polar whirl during northern winter (October to February). In the winter season the upper air westerly jet streams are bifurcated into two branches due to physical obstruction of the Himalayan and Tibetan Plateau. One branch is located to the south of the Himalayas, while the second branch is positioned to the north of the Tibetan Plateau.

10.3.3

SEASON IN INDIA

The subcontinent of India has great latitudinal dimensions: there are different seasons from Kanyakumari (Cape-Camorin) to Jammu and Kashmir. The Meteorological Department of India, however, divides the seasons of India into the following four seasons:

A. Seasons of North East Monsoon

1. Winter season, mid-December to mid-March, and
2. Hot weather season, mid-March to May

B. Seasons of South-West Monsoon

3. Rainy season June to September and
4. Season of retreating monsoon, October to mid-December.

1. The Cold Weather Season

The cold weather season in the greater parts of India begins in the latter part of November in the north and by beginning of December in the rest of the country. The cold weather season is characterized by out-flowing winds dry and stable air and clear skies. There develops a high pressure (anti-cyclone) area over north India, and a north-westerly flow prevails down the Indus and Ganges Valleys. During this season the southern branch of the subtropical jet stream is positioned over northern India. The middle latitude westerlies reach down to the surface north of about $25^{\circ}N$. South of this latitude the general movement of air is from the north-east. This north easterly wind is called the winter monsoon. In Peninsular India the general direction of wind is from east to west. Because of its trajectory over the Bay of Bengal the easterlies are full of moisture and yield some precipitation along south east coastal regions.

2. The Hot Weather Season

The north Indian region experiences a well defined hot weather season from mid-march to mid-June. with the northward march of the sun towards the Tropic of cancer after the vernal Equinox, the temperature begins to rise. Thermal heating over north western India gradually establishes a thermal “low” at the surface but, while the jet stream remains south of the Himalayas it maintains its dynamic anticyclone aloft over Afghanistan and the borderland of Pakistan. This “lid” of subsiding warming dry air prevents the surface thermal “low” from having sufficient effect as a lifting agent to carry air aloft and so bring about precipitation (Johnson, 1969, p.17).

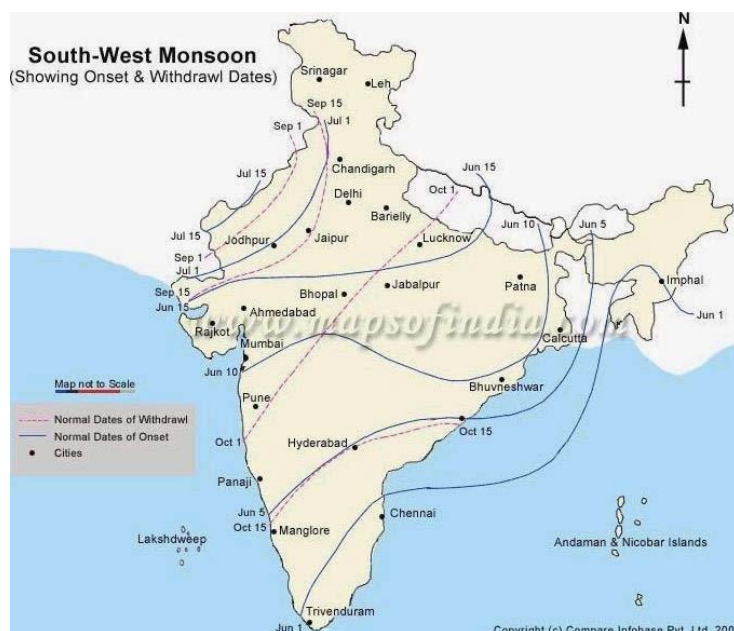
At the advent of March, the temperature starts rising abruptly. By April, the peninsular regions south of Vindhyan range heat up with mean maximum temperature of 40°C . In May, the mean maximum temperature reaches 42°C in Rajasthan, Delhi, west Uttar Pradesh, south Panjab, Jammu city and Haryana.

3. The Season Of General Rains

By the end of June, a low pressure area develops over Punjab and Rajasthan. The southern branch of the jet stream weakens and finally withdrawn from the southern slopes of the Himalayas by mid-June leading to the formation of a dynamic depression over the surface thermal low. The Inter-Tropical Convergence Zone (ITCZ) moves further northwards occupying a position of 25°N by mid-June and allowing equatorial westerlies to gush in the subcontinent. The cyclonic vortices developed in the ITC cause rains in the country. The tropical easterly jet streams originating due to thermal heating of Tibet intensifies Indian ocean high pressure cell from which south east trade winds are pushed by the Antarctic circumpolar whirl to develop as south west monsoon.

4. Season of Retreating Monsoon

The south west monsoon begins to retreat from northern India by the third week of September with the southward migration of the sun. By the end of September, the south west monsoon retreats from the Punjab plains and adjacent regions. However unlike the sudden burst of monsoon, the retreat is a steady and gradual (Fig.). By mid-October, the southerly branch of the jet stream returns to its winter position south of the Himalaya.



Normal dates of Withdrawal (Retreat) of South-West Monsoon

10.3.3.1

RAINFALL DISTRIBUTION

The distribution of rainfall in India is highly uneven. Its distribution is largely controlled by the nearness of the sea and the orographic features. The influence of the Western Ghats, the Plateau of Meghalaya, the north-eastern hills, and the Himalaya mountain is quite significant. The average annual distribution of rainfall in India has been shown in Fig. it may be observed from (Fig.) that the regional variations in the distributions of average annual rainfall over India are quite pronounced. In the southern parts of the Meghalaya plateau (Mawsynram and Cherrapunji), the average annual rainfall is more than 1200 cm or less in the Brahmaputra valley and the adjoining hills.

In Peninsular India, the highest rainfall occurs along the Kankan and Malabar coasts. The isohyet of 150 cm rainfalls runs southwards from the Gujarat coast, roughly parallel to the crest of the Western Ghats up to Kanyakumari. In northern India, it includes the hills of Himachal Pradesh, Uttarakhand, Chhattishgarh, eastern Maharashtra and northern Andhra Pradesh. The regions lying to the west and south west of this line have generally deficient rainfall where agriculture largely vulnerable to drought. Along the Coromandal coast of India the average annual rainfall is over 100cm. In Punjab, Haryana and northern Rajasthan the mean annual rainfall is 60cm or less. The lowest rainfall is recorded in western Rajasthan, the north western parts of Gujarat, and Ladakh where it is less than 20cm.

10.3.4

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CLIMATIC REGIONS OF INDIA

India is often referred to as a country with tropical monsoon type of climate. The large size of India, its latitudinal extent, the presence of the Himalayas in the north, and the Indian Ocean, Arabian Sea and Bay of Bengal in the south have resulted in great variations in the distribution of temperature and precipitation in the subcontinent of India.

A number of attempts have been made by climatologists, geographers and experts of agriculture to divide India into climate regions. While some of these classifications have been suggested for world climates, others are exclusively applied to Indian conditions. Some of the important climatic divisions of India were made by the following experts:

1. H.E. Blandford, 1889
2. W. Koppen, 1918,1931,1936
3. C.W. Thornthwaite, 1931,1933,1948
4. L.D. Stamp and W.G. Kendrew,1953

5. S.P. Chatterji, 1953
6. G.T. Trewartha, 1954
7. V.P Subramanyam, 1956
8. B.L.C Johnson, 1969
9. K.L. Rao, et.al., 1971
10. R.L. Singh, 1971

A systematic study of the climate divisions of India was attempted for the first time by H.E. Blandford- the first Director General of the Indian Meteorological Department-in 1889, who discovered that all types of climates found in the world are present within the subcontinent of India. This classification based on temperature and rainfall of a few selected stations of India was almost an over generalisation. A brief description of some of the important classifications of Indian climate has been given in the following:

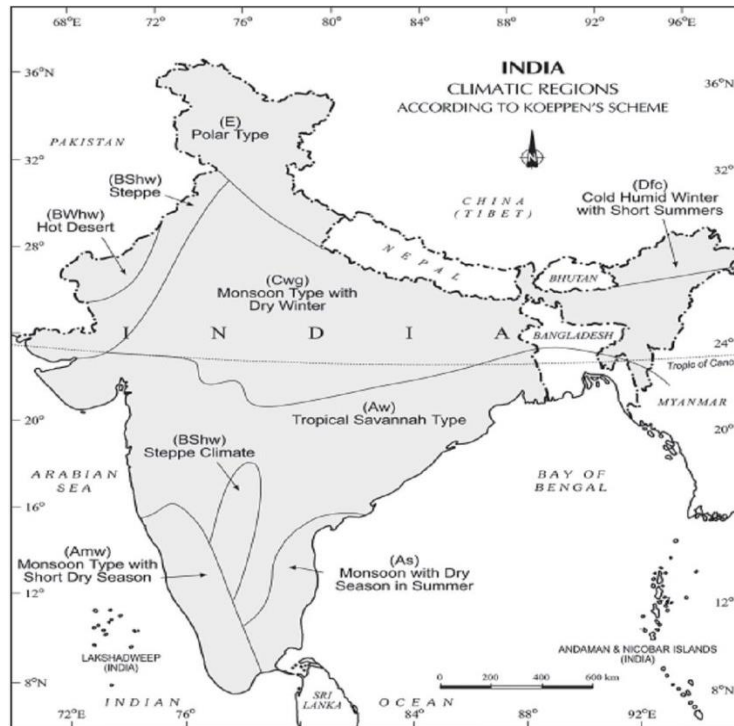
10.3.5

KOPPEN'S CLASSIFICATION OF INDIAN CLIMATE

A Koppen's classification is empirical in nature based on climatic data. Koppen, for the delineation of climatic regions took into consideration (i) the mean monthly temperature, (ii) the mean monthly rainfall, and (iii) the mean annual rainfall. Koppen divided the country into three broad climatic zones:

1. Humid (A)
2. Arid (B)
3. Semi-Arid (C and D)

These three broad climatic divisions were sub-divided into sub-types on the basis of seasonal variations in the distribution pattern of precipitation and temperature for which the symbols S, W, m, f, w, s, c and h have been used. Based on Köppen's climate scheme, India can be divided into the following nine climate regions.



Koppens Climatic Regions

Table- Koppen's Classification of Indian Climate

Code	Climate type	Features	Temperature	Rainfall	Regions of India
Aw	Tropical savanna	Tropical savanna grassland, monsoon deciduous vegetation	Hottest month-May (max. temp: 40°C and min. temp: 27°C) Coldest month temperature is greater than 18°C High ranges of annual and diurnal temperatures	Occurs during season of southwest monsoon-July to September Dry winters	Peninsular India, Jharkhand, Chhattisgarh, Odisha, Andhra Pradesh, Telangana, Maharashtra, Karnataka, Purulia district of West Bengal
Amw	Tropical monsoon	Short winter season, luxurious evergreen rain forests	Annual temperature 24°C to 27°C	Heavy rainfall over 200 cm during the season of southwest monsoon	Konkan, Malabar Coast, adjoining areas of Western Ghats, Plateaus of Tamil Nadu, Southern areas of Tripura and Mizoram
As	Tropical moist	Dry summers	Mean monthly temperature $>18^{\circ}\text{C}$	Average rainfall varies between 75 and 100 cm 75% of total rainfall occurs between September and December	Narrow zone along the Coromandel Coast

BShw	Semi-arid steppe	Hot and dry summer from March to May	Maximum temperatures as high as 40°C	Seasonal rainfall(in summers)	Stretches over rain shadow zone of Karnataka, Tamil Nadu, eastern Rajasthan, Gujarat, Southwestern Haryana
Cwg	Mesothermal climate; Gangetic Plain Type	Hot desert type of climate; dry winters	Average temperature $<18^{\circ}\text{C}$ and temperature of coldest month $>15^{\circ}\text{C}$ Max temperature is recorded in May or first half of June	Below 40 cm	Thar desert
Dfc	Cold humid winter	Short and humid summer and cold humid winter	Winter temperatures are about 10°C and summer temperature 30 to 35°C	Over 200 cm	Sikkim, Arunachal Pradesh, Assam, Tripura, Mizoram
E	Polar	Areas remain under ice during greater part of the year	Temperature of warmest month $<10^{\circ}\text{C}$ Temperature falls by 0.6°C for every 100 m rise in altitude in the Himalayas	Lesser rain on leeward side of the mountains and heavy rainfall on the well exposed slopes	Higher mountainous areas of Jammu and Kashmir, Himachal Pradesh, Uttarakhand
ET	Tundra	Polar ice caps, soil is frozen to hundreds of metre depth, vegetation constitutes of mosses, lichens, dwarf trees, scattered woody shrubs	Average temperature of warmest month is between 0°C and 10°C		Higher altitudes of Ladakh, Kashmir, Himachal Pradesh, Uttarakhand

10.3.6**CLIMATIC DIVISION BY STAMP AND KENDREW**

Professor L.D. Stamp and Kendrew divided India into several climatic divisions. This classification is arbitrary and subjective. Stamp used 18°C isotherm of mean temperature for January to divide the country into two broad climatic regions, namely:

- A. the subtropical or continental zone lying to the north of this isotherm, and
- B. the tropical zone lying to the south of this isotherm. It may be seen from that the isotherm of 18°C runs roughly parallel to the Tropic of Cancer.

The two major climate divisions, on the basis of rainfall, have been further divided into eleven regions.

- A. The subtropical or Continental climate has been divided into the following five divisions:

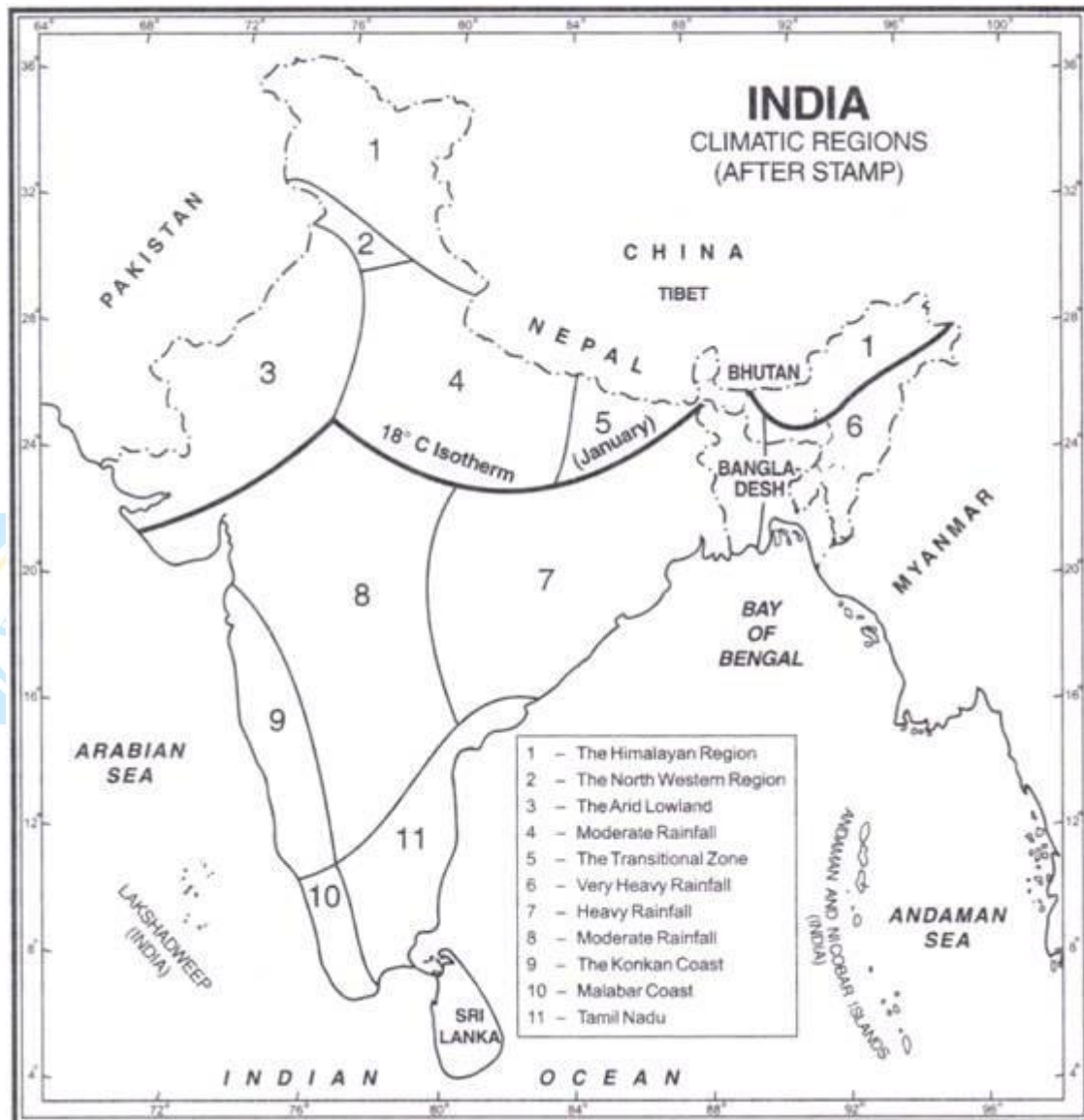
1. The Himalayan Region
2. The North-Western Region
3. The arid lowland (dry plans
4. The region of moderate rainfall
5. The transitional zone]

- B. Tropical India has been divided into the following six regions:

1. Region of very heavy rainfall
2. Region of heavy rainfall
3. Region of moderate rainfall
4. The Konkan Coast
5. The Malabar Coast
6. The Tamil Nadu region

A. Subtropical Climate

The subtropical climate has been subdivided into:



Climatic Division (Stamp)

PREVIOUS YEAR QUESTIONS**Sub Unit – 3****December - 14**

1. Find combination of two given areas where rainfall is characterised by Tropical monsoon rain.

- (i) The Sahyadri (ii) The Ganga Delta
(iii) Kashmir Valley (iv) Ladakh Region
(A) (i) and (iii)
(B) (ii) and (iv)
(C) (i) and (ii)
(D) (iii) and (iv)

2. Find the sequence of higher to lower rainfall from the following areas of India :

- i. Ganga Delta ii. Sahyadri
iii. Eastern U.P. iv. Northern Gujarat

- (A) i, ii, iii, iv
(B) ii, i, iii, iv
(C) iii, iv, ii, i
(D) iv, iii, ii, i

3. Arrange the cities from the higher to lower temperature :

- i. Jaipur ii. Mumbai
iii. Bengaluru iv. Jaisalmer

- (A) iv, i, ii, iii
(B) i, ii, iii, iv
(C) ii, iii, i, iv
(D) iii, ii, iv, i

Answer with Reference

SL. NO.	QUESTION NO.	ANSWER	REFERENCE NO.
1.	10	C	10.3.5
2.	45	B	10.3.3.1
3.	66	A	10.3.5



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June - 15

1. Which one of the following coastal areas of India was affected by 'Hudhud' cyclone ?

- (A) Chennai coast
- (B) Kerala coast
- (C) Andhra Pradesh coast
- (D) Bengal coast

Answer with Reference

SL. NO.	QUESTION NO.	ANSWER	REFERENCE NO.
1.	45	C	10.3.3



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July - 16

1. Generally the variability of rainfall during August in India would be more pronounced at
- (A) Kolkata
 - (B) Ranchi
 - (C) Jodhpur
 - (D) Lucknow



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Answer with Reference

SL. NO.	QUESTION NO.	ANSWER	REFERENCE NO.
1.	44	C	10.3.3



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SUB UNIT-4

10.4.1

Table - The Region Wise Distribution of Forests in India-2017

S. No	Physiographic Zone	Geographical Area	Forest Cover	Percent of Forest cover to Geographical Area
1	Western Himalaya	328,952	9393	2.86
2	Eastern Himalaya	81,752	610	0.75
3	North East Ranges	127,857	2792	2.18
4	Northern Plains	295,909	9196	3.11
5	Eastern Plains	222,365	4759	2.14
6	Western Plains	320,507	6352	1.98
7	Central Highlands	371,281	1,1534	3.11
8	North Deccan	365,711	7994	2.19
9	East Deccan	333,824	10,663	3.19
10	South Deccan	291,317	7857	2.70
11	Western Ghats	73,681	4109	5.58
12	Eastern Ghats	192,068	3936	2.05
13	West Coast	73,681	4109	8.31
14	East Coast	168,634	5175	3.07
	Total	3,287,469	93,815	2.85

10.4.2

Table - India classification of forests on the basis of Rainfall Distribution

Vegetation Type	Average Annual Rainfall(cm)	Zone
1. Evergreen forests	Above 200	Humid
2. Monsoon forests	100-200	Semi-Humid
3. Dry forests	50-100	Dry
4. Desert forests	Below 50	Very Dry(deserts)

10.4.3

Table - Forest Cover of India-2007

Class	Area(km ²)	Percentage of Geographical Area
Very dense forest	98,158	2.99
Moderately dense Forest	308,318	9.38
Open Forest	301,797	9.18
Total Forest Cover *	708,273	21.54
Scrub	45,979	1.40
Non Forest	2,533,217	77.06
Total Geographical Area	3,287,469	100.00

10.4.4**Table - Percentage Share of Different Types of Forests(2010)**

Type of Forest	Percent (Total Forest Area)
1. Tropical Moist Deciduous	37.0
2. Tropical Dry Deciduous	28.8
3. Tropical Evergreen	12.1
4. Subtropical	9.5
5. Montane Wet Temperate	7.0
6. Alpine and Sub-alpine	2.9
7. Tropical Thorny	2.6
8. Mangrove	0.06



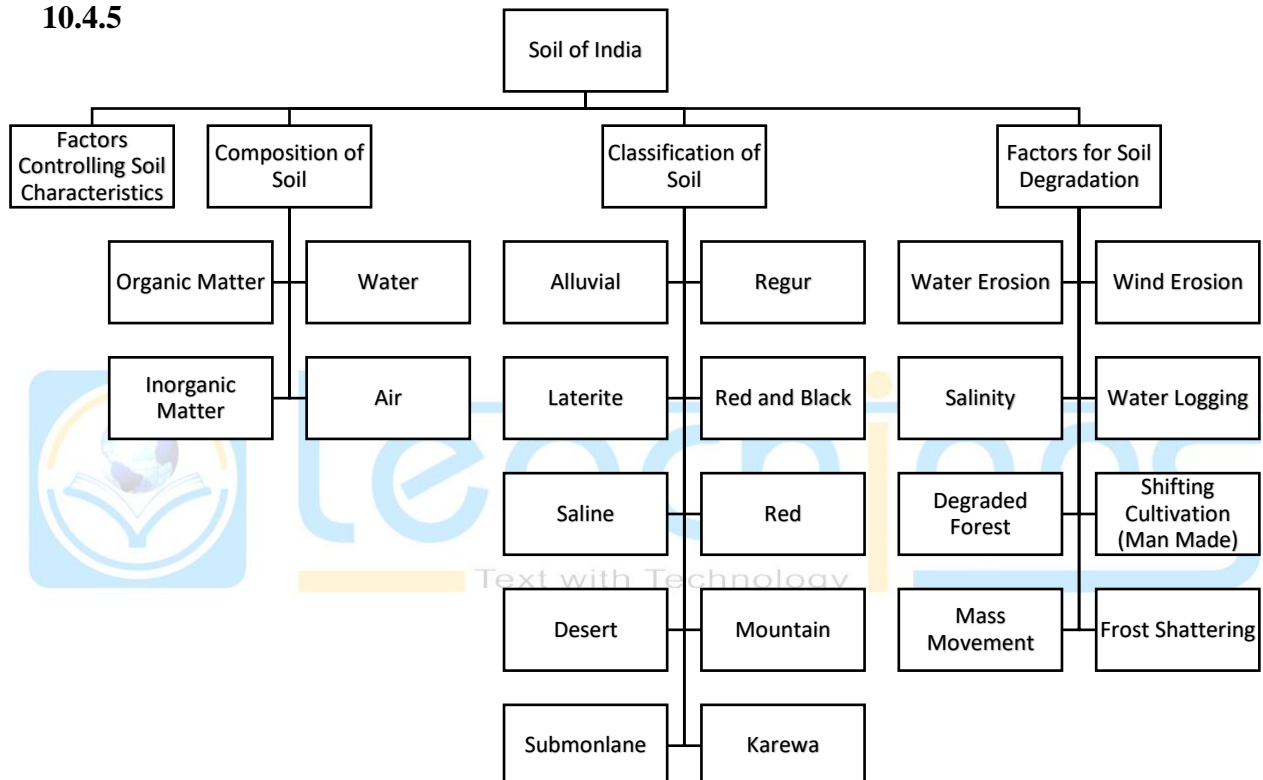
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Soil

INTRODUCTION

The loose material or the upper layer of the mantle rock (regolith -a layer of loose, heterogeneous material covering solid rock) consisting mainly of very small particles and humus which can support the growth of plants is known as soil.

10.4.5



10.4.6


Types of soils of India


Soil Type		Area (in million hectares)	Percentage	Composition	Regions	Crops
Alluvial	Khadar	143.1	43.36	Rich in Phosphoric acid, poor in potash	Indus-Ganga-Brahmaputra-plains, Narmada-Tapi plains	Wheat, maize, sugar cane, pulses, oilseeds, berseem(fodder)
	Bhangar					
Red (omnibus group)		61.0	18.49	Ferric oxide gives it red colour, deficient in lime, phosphate, manganese	Western Tamil Nadu, Karnataka, Southern Maharashtra, Andhra Pradesh, Chhattisgarh, Jharkhand, Odisha, some areas of Bundelkhand, Mirzapur, Sonbhadra, Bansware, Bhilwara, Udaypur	Wheat, Cotton, Pulses, Tabaco, millets, oilseeds, potato, orchards




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Black(Regur); internally known as Tropical chernozems	49.8	15.09	Iron, lime, calcium, potassium, aluminium, magnesium, deficient in nitrogen, phosphorous, organic matter	Gujarat, Maharashtra, Western Madhya Pradesh, North western Andhra Pradesh, Karnataka, Tamil Nadu, Rajasthan, Chhattisgarh, Jharkhand up to Rajmahal	Cotton, pulse, millets, linseed, castor, tobacco, sugar cane and vegetables
Mountain 	18.2	5.51	Acidic and low humus content	Mid – latitude zone of Himalaya, regions of Assam, Darjeeling, Uttarakhand, Himachal Pradesh, Jammu and Kashmir	Maize, rice, legumes, fodder, orchards
Desert	14.6	4.42	High percentage of soluble salts, low organic matter, varying percentage of calcium carbonate	Rajasthan, West of Aravallis, northern Gujarat, Saurashtra, Kutch, Western parts of Haryana, South- western parts of Punjab	Bajra, guar, pulses, fodder and less water requiring crops like Aloe vera

Laterite	12.2	3.70	Rich in iron and aluminium, poor in nitrogen, potash, potassium, lime, organic matter	Western Ghats, Eastern Ghats, Rajmahal Hills, Satpura, Vindhya, Odisha, Chhattisgarh, Jharkhand, West Bengal, North Cachar Hills of Assam, Garo Hills of Meghalaya.	Rice, ragi, sugar cane, cashew nuts
Submontane 	5.7	1.73	Neutral to alkaline	Jhelum and Indus valley of Tarai region of submontane from J & K to Assam	Rice
Snowfields	4.0	1.21	Covered with ice and glacier	Greater Himalayan Region, Karakoram, Ladakh, Zaskar	Unsuitable for cultivation of crop
Grey and Brown	3.6	1.09	Iron oxide	Rajasthan and Gujarat	Cotton and oil seeds.
Saline and alkaline (Known by local names as kallar, usar, dakar, thur, kari, chopan)			Sodium chloride and sodium phosphate	Rajasthan, Haryana, Punjab, Uttar Pradesh, Bihar, Maharashtra	Berseem, dhaincha, leguminous crops

Peaty and marshy			Rich in organic matter, highly saline, deficient in phosphate and potash	Kottayam, Alappuzha districts of Kerala, Sundarban Deltas of Mahanadi, Krishna, Kaveri, Rann of Kutch.	Rice cultivation
Karewa			Characterised with fossils of mammals and peat	Kashmir valley, Bhadarwah valley and Doda districts of Jammu	Saffron almond, walnut, apple, orchards
Red and Black 	17.8			Isolated parts of Bundelkhand, East of Aravallis in Rajasthan, Gujarat	Maiza, bajra, millets, pulses, oilseeds.

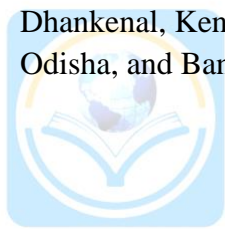
10.4.7**Mineral Resources**

A mineral is aggregate of two or more than two elements. A mineral has a definite chemical composition, atomic structure and is formed by inorganic process.

Distribution of Minerals

The mineral wealth of India is largely confined to the igneous and metamorphic rocks of peninsular India, while the Great plains of India and the Himalayan region are almost devoid of the metallic minerals. The state which are rich in the metallic and non-metallic minerals are Jharkhand, Chhattisgarh, Odisha, Bihar, West Bengal, Madhya Pradesh, Karnataka, Kerala, Maharashtra, Tamil Nadu, Rajasthan, Gujarat, Uttarakhand, Andhra Pradesh, Tripura and Assam. The states of Uttar Pradesh, Haryana, Punjab, Himachal Pradesh, Jammu and Kashmir and Gangetic West Bengal are however, poor in mineral resources.

The following minerals belts may be identified in India- The chotanagpur Belt-(Dhanbad, Hazaribad, Palamu, Ranchi, Santhal Pargana, and Singhbhum in Jharkhand, Cuttack, Dhankenal, Kendujhar(Keonjhar), Koraput, Mayurbhanj, Sambhalpur, and Sundargarh in Odisha, and Bankura, Birbhum, Medinipur and Purulia in West Bengal).



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PREVIOUS YEAR QUESTIONS**Sub Unit – 4****June - 15**

1. Which one of the following states has the maximum area under teak forest of India ?
- (A) Uttar Pradesh
 - (B) Bihar
 - (C) Karnataka
 - (D) Madhya Pradesh.



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Answer with Reference

SL. NO.	QUESTION NO.	ANSWER	REFERENCE NO.
1.	43	D	10.4.2,10.4.5



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December - 15

1. Which of the following is incorrect in the case of India ?
- (A) Red soils are rich in iron
 - (B) Black soils are rich in phosphorus, nitrogen and organic matters
 - (C) Alluvial soils are rich in potash but poor in phosphorus
 - (D) Red soils are suitable for cultivation of pulses and coarse grains.

2. Which region of India is known as the 'Rice Bowl' ?

- (A) Indo-Gangetic Plain
- (B) Krishna-Godavari Delta Region
- (C) North Eastern Region
- (D) Kerala and Tamil Nadu

3. Match **List - I** with **List - II** and select the correct answer from the codes given below :

List - I**(National Park)**

- (a) Fossil
- (b) Brakmagiri
- (c) Guindy
- (d) Rohia

List - II**(State)**

- (i) Himachal Pradesh
- (ii) Madhya Pradesh
- (iii) Tamil Nadu
- (iv) Karnataka

Codes :

- | | (a) | (b) | (c) | (d) |
|-----|-----|-----|-----|-----|
| (A) | i | ii | iii | iv |
| (B) | iii | iv | ii | i |
| (C) | iv | iii | i | ii |
| (D) | ii | iv | iii | i |

Answer with Reference

SL. NO.	QUESTION NO.	ANSWER	REFERENCE NO.
1.	40	B	10.4.6
2.	66	B	10.4.6
3.	60	D	UNIT-4



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June - 16

1. Which one of following groups of states accounts for about 90% of the annual coal production in India ?

- (A) Madhya Pradesh, Tamil Nadu and West Bengal
- (B) Orissa, Madhya Pradesh and Tamil Nadu
- (C) Jharkhand, Orissa and Madhya Pradesh
- (D) Jharkhand, Orissa and West Bengal

2. Which one of the following soils is commonly known as 'self-mulching soil' ?

- (A) Grey soil
- (B) Red soil
- (C) Brown soil
- (D) Black soil

3. Vertisols (Kan har soils) of Chhattisgarh in respect of depth are considered to be

- (A) Shallow
- (B) Medium
- (C) Medium to deep
- (D) Deep

4. The rank of Chhattisgarh in Indian states in terms of percentage of their forests cover is

- (A) First
- (B) Second
- (C) Third
- (D) Fourth

5. Match **List-I** with **List-II** and select the correct answer using codes given below.

List – I**(Soils)**

I. Alluvial

II. Black Soil (Regur)

III. Desert

IV. Red

List – II**(States)**

A. Rajasthan

B. Uttar Pradesh

C. Maharashtra

D. Meghalaya

Codes :

- | | (a) | (b) | (c) | (d) |
|-----|-----|-----|-----|-----|
| (A) | i | ii | iv | iii |
| (B) | ii | iii | iv | i |
| (C) | ii | iii | i | iv |
| (D) | iv | ii | iii | i |

Answer with Reference

SL. NO.	QUESTION NO.	ANSWER	REFERENCE NO.
1.	41	D	10.4.7
2.	27	D	10.4.6
3.	65	D	10.4.6
4.	66	C	10.4.1
5.	67	C	10.4.6



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November - 17

1. In which one of the following states of India the maximum Teak forest is found ?

- (A) Madhya Pradesh
- (B) Bihar
- (C) Uttar Pradesh
- (D) Karnataka



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Answer with Reference

SL. NO.	QUESTION NO.	ANSWER	REFERENCE NO.
1.	42	A	10.4.1,10.4.2,10.4.3



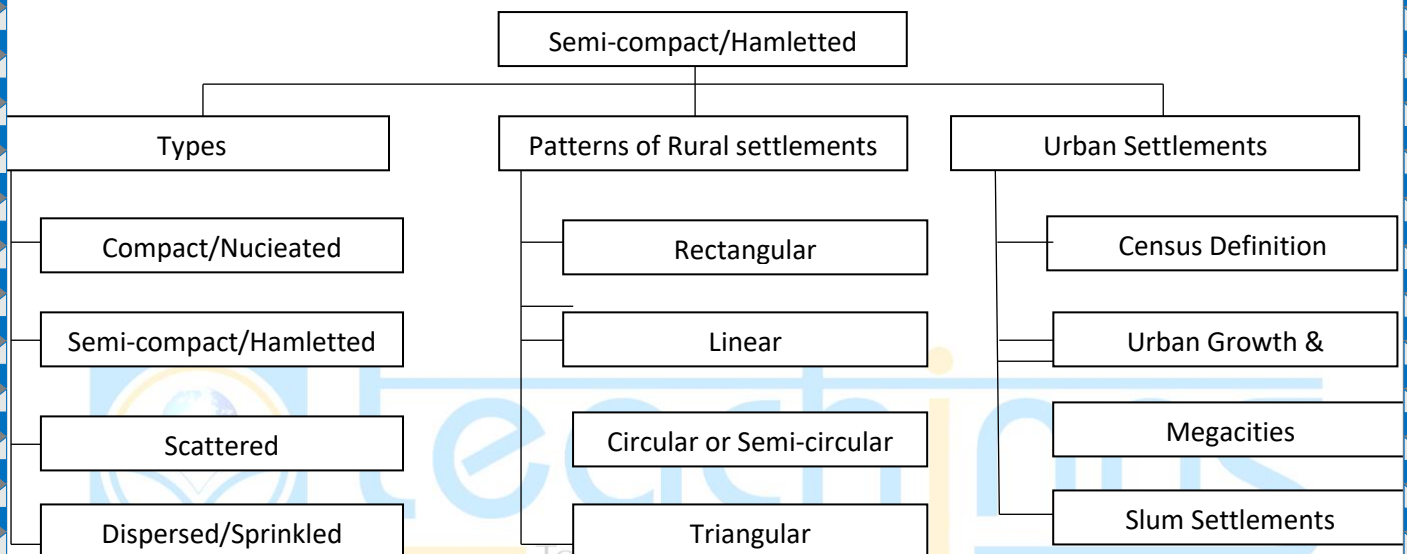
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SUB UNIT-5

INTRODUCTION

After food, settlement is the most important need of human being. They construct houses and develop settlements to protect themselves against the vagaries of weather and to enjoy social life. In fact, settlement is man's most important step towards adapting himself to his or her physical and cultural environment.

10.5.1



Types of Rural Settlements

2. Compact (Agglomerated, Clustered or Nucleated Settlement)

A compact settlement has a well defined form in which the house are clustered in a small space.

3. Semi-Compact or Hamletted Settlements

The semi-compact settlement is an intermediary type of settlement, marked by the presence of one easily recognisable site and one or more small hamlets closely linked with the main site by foot-paths, cart-tracks or roads.

4. Scattered (Semi-Sprinkled Settlements)

Such settlements are characterised by the presence of several smaller purvas (hamlets) and several individual habitations.

5. Dispersed or Sprinkled Settlements

The dispersed settlements is characterised by complete diffusion of farmsteads over the entire Mauza Land.

Patterns (Forms or Designs) of Rural Settlements

1. **Rectangular Pattern:** Rectangular settlements develop generally in the intensively cultivated productive plains of the country.
2. **Linear Pattern:** Linear settlements are those which develop in a line and acquire a linear shape.
3. **Circular and Semi-Circular Pattern:** Circular and semi-circular settlements generally develop around a pond, a lake, a crater or sea-coast. Since people prefer to stay closer to the water body, they construct their houses close to the pond or lake.
4. **Star-Like Pattern:** The star-like pattern of rural settlements develop at the sites and places where several roads converge.
6. **Triangular Pattern:** The triangular patterns of rural settlements develop at the confluence of rivers or where two roads converge in the form of a triangle.
7. **Nebular Pattern:** When the shape of a settlement resembles a nebula, it is known as a nebular pattern of rural settlement.
8. **Terraced Patterns:** In the mountainous areas the cultivators develop terraced fields for cultivation and orchards.
9. **Amorphous Patterns:** When the village land is dotted with several hamlets and individual farmsteads, all being linked by footpaths with the main settlement, no definite pattern is discernible.

10.5.2

Trend of Urbanisation – 1881-2011

Year	Urban Population (in.million)	Decadal Growth (per cent)	Urbalisation (per cent)	No.of Towns
1881	9.3			
1891	9.4			
1901	25.85	-	11.0	1917
1911	25.95	0.35	10.4	1909
1921	28.09	8.27	11.3	2047
1931	33.46	19.12	12.2	2216
1941	44.15	31.97	14.1	2424
1951	62.44	41.42	17.6	3059
1961	78.93	26.41	18.3	2699
1971	109.09	38.22	20.2	3119
1981	156.19	46.02	23.7	4019
1991	217.61	39.32	25.7	4689
2001	286.12	31.48	27.8	5167
2011	377.00	31.00	31.16	7935

10.5.3

Urban Population 2011

State/Union Territory	Percentage of Urban Population to total Population
States	
Andhra Pradesh	33.48
Including Telangana	
Arunachal Pradesh	22.67
Assam	14.08
Bihar	11.30
Chhattisgarh	23.24
Goa	62.17
Gujarat	42.58
Haryana	34.79
Himachal Pradesh	10.04
Jammu & Kashmir	27.21
Jharkhand	24.05
Karnataka	38.57
Kerala	47.72
Madhya Pradesh	27.63
Maharashtra	45.23
Manipur	30.21
Mizoram	51.51



Maghalaya	20.08
Nagaland	28.97
Odisha	16.68
Punjab	37.49
Rajasthan	24.89
Sikkim	24.97
Tamil Nadu	48.45
Tripura	26.18
Uttar Pradesh	22.31
Uttarakhand	30.55
West Bengal	31.89
Union Territories	
Chandigarh	97.25
Delhi	97.50
Daman & Diu	75.16
Lakshadweep	78.08
Pondicherry	68.31
Dadar & Nagar Haveli	46.62
Andaman & Nicobar	35.67
Island	
India	31.16



10.5.3.1**Number of Towns and Households and Slum Population-2011**

Sl. No	Indian/State/Union territory	Urban households	Slum households. Absolute	Percentage
1	Arunachal Pradesh	65,891	4,005	6.1
2	Nagaland	115,054	15,268	13.3
3	Manipur	171,400	NS	NS
4	Mizoram	116,203	16,240	14
5	Tripura	235,002	33,830	14.4
6	Meghalaya	116,102	10,936	9.4
7	Assam	992,742	48,122	4.8



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PREVIOUS YEAR QUESTIONS**Sub Unit – 5****December - 14**

1. Which one of the North-Eastern states has the highest concentration of tribal population ?

- (A) Meghalaya
- (B) Assam
- (C) Mizoram
- (D) Nagaland



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Text with Technology

Answer with Reference

SL. NO.	QUESTION NO.	ANSWER	REFERENCE NO.
1.	65	C	10.5.3.1



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June - 15

1. Report published by UNDP which compares countries based on education levels of people, their health status and per capita income, is :

- (A) Human Education Report
- (B) Human Population Report
- (C) Human Development Report
- (D) Human Quality Report



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Answer with Reference

SL. NO.	QUESTION NO.	ANSWER	REFERENCE NO.
1.	67	C	10.9.6



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November - 17

1. Given below are two statements, one labelled as Assertion (A) and the other labelled as Reason (R). Select your answer from the code given below :

Assertion (A) : With every successive census in India, the growth of population results in greater increase in slum population.

Reason (R) : Both the area and the population of India have been increasing continuously.

Code :

- (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 a correct explanation of (A).
- (C) (A) is true, but (R) is false.
- (D) (A) is false, but (R) is true.



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Text with Technology

Answer with Reference

SL. NO.	QUESTION NO.	ANSWER	REFERENCE NO.
1.	67	C	10.5.3.1



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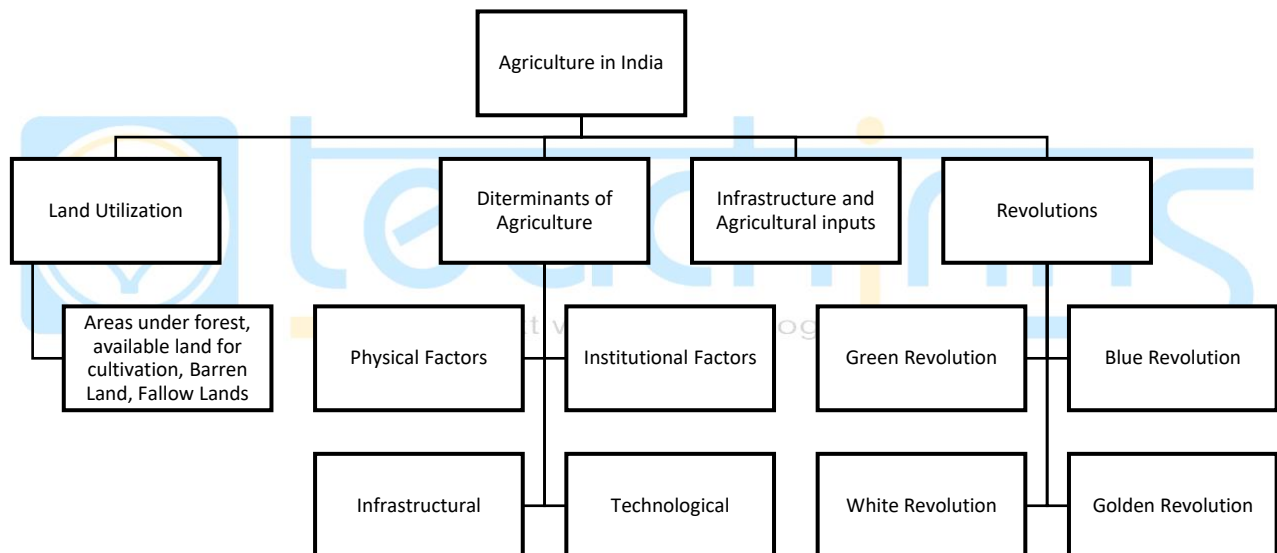
SUB UNIT-6

Agriculture

10.6.1

Indian economy hinges on agriculture. Over 58% of Indian population is directly or indirectly dependent on agriculture. Agriculture and allied sectors contribute nearly 15.87% of gross domestic product (GDP) of India (Statistics Times Feb 8, 2019). Besides, agriculture is an important source of raw material for industrial products.

10.6.2



Determinants of Agriculture

The Agricultural practices, cropping patterns and their productivity are closely determined by the geo-climatic, socioeconomic and cultural-political factors. In fact, the agriculture of any region is influenced by the following factors –

1. Physical factors – Terrain, topography, climate and soil.
2. Institutional factors – Land tenure, land tenancy, size of holdings, size of fields and land reforms.
3. Infrastructural factors – Irrigation, electricity, roads, credit and marketing, storage facilities, crop insurance and research.
4. Technological factors – High yielding varieties (New seeds), chemical fertilisers, insecticides, pesticides and farm machinery.

These factors individually and collectively have their impact on the cropping patterns, level of agricultural development and yield of crops in a region. A brief account of these factors has been given below.

10.6.3

Revolutions in India	Product	Person Associate with
1. Black Revolution	Petroleum Production	
2. Blue Revolution	Fisheries	Dr. Arun Krishnan
3. Brown Revolution	Honey-bee(Apiculture)	
4. Evergreen Revolution	Over-all Development of Agriculture	Dr. Arun Krishnan
5. Grey Revolution	Housing Development/Fertilisers	
6. Golden Revolution	Horticulture	Nirpakh Tutez
7. Golden Fibre Revolution	Jute	Nirpakh Tutez
8. Green Revolution	Agriculture	Norman Borlaug, M.S Swaminathan, W. Gaud

9. Pink Revolution	Prawn, onion, pharmaceutical	Durgesh Patel, Vishal Tewari
10.Red Revolution	Meat and Tomato	Vishal Tewari
11.Round Revolution	Potato	Indira Gandhi
12.Silver Fibre Revolution	Cotton	Verghese Kurien
13. Silver Revolution	Poultry and Eggs	Indira Gandhi
14. White Revolution	Dairy Development	Verghese Kurien
15. Yellow Revolution	Oil – seeds	Sam Pitroda
16. Protein Revolution	Technology driven 2 nd Green Revolution	Coined by PM Narendra Modi and FM Arun Jaitley

Spatial Organisation of Agriculture

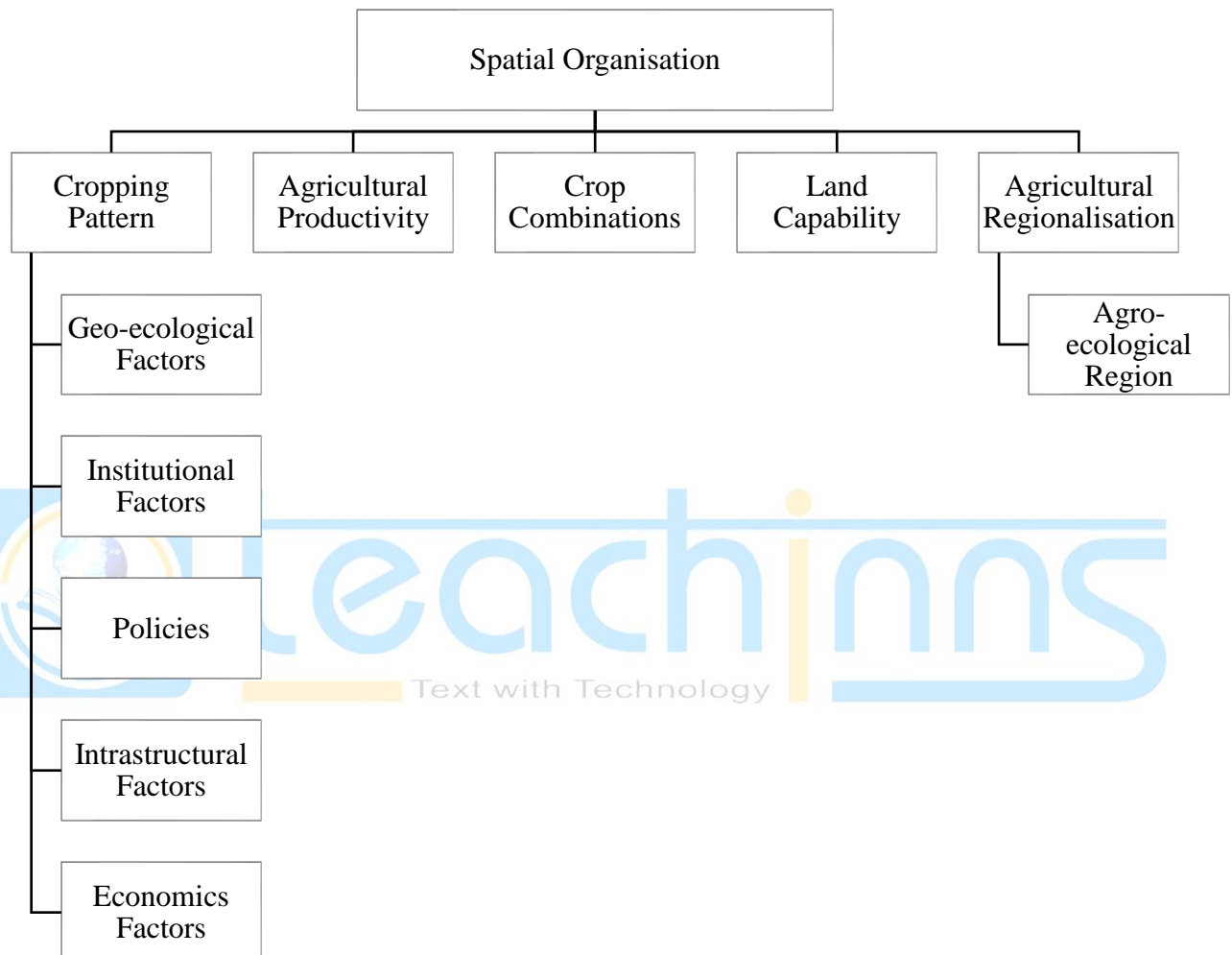
10.6.5 Agricultural Productivity

Agricultural Productivity is a Synonym for agricultural efficiency. They yield per unit area is known as agricultural productivity. Agricultural Productivity is generally the result of the Physical, Socioeconomic, and cultural farmer. Agricultural Productivity, however, is a dynamic concept which changes in space and time.

Agricultural Productivity of a region is closely influenced by a number of physical (physiography, terrain, climate, soils and water), socioeconomic, infrastructural institutional and organisational factors. Agricultural Productivity also depends on the managerial skill of the farmer, his attitude, and aspirations for the better standard of living.

10.6.6 Cropping Patterns

The cropping pattern is an indicator to show the proportion of area under different crop at definite point of time. The crop statistics published by the government are used to denote the cropping patterns.



$$\text{Relative Yield Index} = \frac{\text{Mean Yield of the Crop in a component areal Unit}}{\text{Mean yield of the total area}} \times 100$$

$$\text{Relative Spread Index} = \frac{\text{Cultivated area in the areal unit}}{\text{Area of the drop expressed as-percentage of the total cultivated area}} \times 100$$

10.6.7 Crop Concentration

Crop Concentration Index =

$$\frac{\text{Area of } \times \text{crop in the component areal unit}}{\text{Area of all crops in the component area unit}} \bigg/ \frac{\text{Area of } \times \text{crop in the entire regions/ country}}{\text{Area of all crops in the entire region/ country}}$$

10.6.8 Agricultural Intensity

$$\text{Agricultural Intensity} = \frac{\text{Gross (total)cropped area}}{\text{Net Cultivated area}} \times 100$$

10.6.9 Crop Combinations

Crop Combination regions may be summed up under two categories –

- 1) The arbitrary choice method and
- 2) The Statistical method.

In the arbitrary choice method, the first two or the first three crops in the area are included and the rest of the crops are excluded from the combination.

The second method is known as statistical method. This method being based on statistical formula is more scientific and reliable for the objective grouping of crops. In the field of agricultural geography, weaver (1954) was the first to use statistical technique for the demarcation of crop combination regions of the middle west (USA).

Monoculture = 100% of the total harvested crop land in one crop.

2 crop combination = 50 % in each of the two crops.

3 crop combination = 33.3 % each of the crops.

4 crop combination = 25 % in each of the four crops.

5 crop combination = 20 % in each of five crops.

10 crop combination = 10 % in each of 10 crops.

For the determination of the minimum deviation the standard deviation method was used

$SD = \sqrt{\frac{\sum d^2}{N}}$ where 'd' is the difference between the actual crop percentage in a given county (areal unit) and the appropriate percentage in the theoretical curve and n is the number of crops in a given combination.

10.6.10 Agricultural Regionalisation

Region is one of the basic concepts in geography. It has been defined differently by different geographers. A Widely accepted definition of region is “an area that is differentiated from other areas according to a specific criteria” “In other word, geo region is differentiated segment of the earth surface (whitt lesey, 1936)”.

Many of the scholars have attempted to delineate the agricultural regions of India. The divisions of India into climatic divisions made by L.D stamp (1958), M.S.A. Randhawa (1958). O.H.K. spate and A.T.A. Learmonth (1960), P.Sengupta and G. Sdasyuk (1967). R.L.Sing (1971) and Jasbir Sing (1975) are important. A brief account of some of the important agricultural regionalisation's of India have been given in the following section.

M.S. Randhawa's classification of Agriculture (1958)

On the basis of geo-climatic variations, crop characteristics and animals, Randhawa has identified five main agricultural region of India –

- 1) The Temperate Himalayan Region.
- 2) The Northern Dry (Wheat) Region.
- 3) The Eastn Wet (Rice) Region.
- 4) The Western Wet (Malabar) Region.
- 5) The Southern Coarse (Cereals) Region.

P. Sengupta and G. Sdasyuk's classification of Agricultural

Miss P. Sengupta and Galina sdasyuk (1968) presented a three-tier classification of Indian's agricultural regions.

- i) Climatic Characteristics: 4 macro region.
- ii) Physiographic Characteristics: 11 meso region.
- iii) Crop Combinations: 60 micro regions.

These agricultural regions have been plotted in to.

- 1) Himalayan Agricultural Region.
- 2) The Dry Agricultural Region.
- 3) The Sub-Humid Region.
- 4) The Wet Agricultural Region.

AGROCLIMATIC REGION

10.6.11

INTRODUCTION :- India is a country of great geographical diversity. The variations in its terrain, temperature, rainfall and soils have closely influenced the cropping patterns and other agricultural activities. For the planning and development of agriculture, the planning commissions and the National Remote Sensing Agency (NRSA) have divided the country in agroclimatic regions. In the delineation of these agroclimatic regions, the physical attributes of the regional and socio-economic characteristics have been taken into consideration.

The agroclimatic regions are :-

- (1) The north western mountainous region.
- (2) The north – eastern region
- (3) The Sat - Yamuna plain
- (4) The upper Ganga plain
- (5) The middle Ganga plain
- (6) The lower Ganga plain
- (7) The south – eastern plateau
- (8) The Aravalli – Malwa upland
- (9) The plateau of Maharashtra
- (10) The Deccan interior
- (11) The Easter Coast
- (12) The Wester Coast
- (13) The Gujarat region
- (14) The wester Rajasthan
- (15) The Island of Andaman & Nicobar.

PREVIOUS YEAR QUESTIONS**Sub Unit – 6****December - 14**

1. Main cause of difference between shifting cultivation and contour farming in India, is
- (A) Environmental effect
 - (B) Technological development
 - (C) Availability of land
 - (D) Population density



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Answer with Reference

SL. NO.	QUESTION NO.	ANSWER	REFERENCE NO.
1.	63	A	10.6.2



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December - 15

1. In which state of India the highest production of wheat is found ?

- (A) Punjab
- (B) Uttar Pradesh
- (C) Haryana
- (D) Bihar

2. Which region of India is known as the 'Rice Bowl' ?

- (A) Indo-Gangetic Plain
- (B) Krishna-Godavari Delta Region
- (C) North Eastern Region
- (D) Kerala and Tamil Nadu



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Text with Technology

Answer with Reference

SL. NO.	QUESTION NO.	ANSWER	REFERENCE NO.
1.	43	B	Highest Production of wheat is found in U.P,2018
2.	66	B	10.4.6



teachinns
Text with Technology

July- 16

1. Given below are two statements, one labelled as **Assertion (A)** and other labelled as **Reason (R)**. Select your answer from the codes given below :

Assertion (A) : Wheat producing area confine to sub-humid and semi-arial areas in India

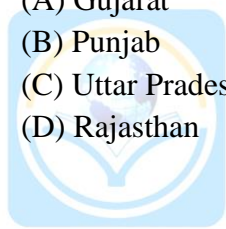
Reason (R) : This crop does not require plenty of stagnant water

Codes :

- (A) Both (A) and (R) are true and (R) is correct explanation of (A).
- (B) Both (A) and (R) are true, but (R) is not correct explanation of (A).
- (C) (A) is true, but (R) is false.
- (D) (A) is false, but (R) is true.

2. The largest milk producer state of India is

- (A) Gujarat
- (B) Punjab
- (C) Uttar Pradesh
- (D) Rajasthan



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Text with Technology

Answer with Reference

SL. NO.	QUESTION NO.	ANSWER	REFERENCE NO.
1.	43	B	Rainfall 75c.m annual,and Temperature 10 – 15 degree C,21-26 degree C
2.	40	C	The largest Milk producer state of India is U.P,Total 17% Out of 100%



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Text with Technology

November - 17

1. Match List - I with the List - II and select the correct answer from the code given below :

List - I

(Crops)

- (a) Raw cotton
- (b) Mustard
- (c) Maize
- (d) Wheat

List - II

(Largest producer state, 2016-17)

- (i) Uttar Pradesh
- (ii) Rajasthan
- (iii) Gujarat
- (iv) Andhra Pradesh

Code :

- | | (a) | (b) | (c) | (d) |
|-----|-----|-----|-----|-----|
| (A) | iii | iv | ii | i |
| (B) | iv | iii | i | ii |
| (C) | iii | ii | iv | i |
| (D) | i | ii | iii | iv |



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Text with Technology

Answer with Reference

SL. NO.	QUESTION NO.	ANSWER	REFERENCE NO.
1.	65	C	Largest Producer State Raw cotton is Gujarat, Largest Producer State Mustard is Rajasthan, Largest Producer State Maize is Andhra Pradesh, Largest Producer State Wheat is Uttar Pradesh



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Text with Technology

SUB UNIT-7

10.7.1 Industrial Development during the Five-Year Plans

The real growth and development of the industrial sector in India started during the period of Five-Year Plans.

First Five-Year Plan (1951-1956)

The main thrust of the First Five-Year Plan was on agricultural development. Therefore, the emphasis was on increasing capacity of the then existing industries rather than the establishment of new industries. Cotton, woollen and jute textiles, cement, paper, newsprint, power-looms, medicine, paints, sugar, vanaspati (Vegetable Oil), Chemical and Engineering goods, and transport equipment's showed some Progress.

Second Five-Year Plan (1956 – 1961)

Great emphasis was laid on the establishment of heavy industries during the second Five-Year Plan. The second industrial policy was announced in 1956. The main thrust of industrial development was on iron and steel, heavy engineering, lignite projects, and fertiliser industries.

Third Five-Year Plan (1961 – 1966)

There was an emphasis on the expansion of basic industries like iron and steel, fossil-fuel, power, and machine building.

Fourth Five-Year Plan (1969 – 1974)

The Period between 1966 and 1969 was the period of annual plans. The industrial period could not make much progress during the annual plans period.

Fifty Five-Year Plan (1974 – 1979)

The main Stress in this plan was on rapid growth of Steel Plants, export – oriented, and goods of mass consumption. The Steel Plants at Salem, Vijanagar, and Vishakhapatnam were proposed to creat additional capacity. The Steel Authority of India (SAIL) was constituted, moreover, drug manufacturing oil refining, chemical fertilisers, and heavy engineering industries made steady progress.

Sixth Five-Year Plan (1980 – 1985)

The main emphasis in the Sixth Five-Year Plan was on Producing goods to exploit the domestic and international markets. To achieve this objective industries like aluminium, automobiles, electric equipment's, thermostatic were given the Priority.

Seventh Five-Year Plan (1985 – 1990)

The main thrust of the Seventh Five-Year Plan was on “high tech” and electronic industries. Industrial dispersal, Self-employment, exploitation of local resources, and proper training were the preference areas of the plan.

Eight Five-Year Plan (1992 – 1997)

The period between 1990 and 1995 was the period of annual plan. There was a major change in the industrial policy of the Government, of India which was initiated in 1991.

Ninth Five-Year Plan (1997 – 2002)

The main emphasis during this plan was on cement, coal, crude oil, consumer goods, electricity, infrastructures, refinery, and quality steel products.

Tenth Five-Year Plan (2002 – 2007)

During the Tenth Five-Year Plan, the main emphasis was on –

- i) the modernization, technology upgrading, reducing transaction costs, and increased export.
- ii) To enhance export and to increase global competitiveness; and
- iii) To achieve these objectives and reduce the regional inequalities special Economic Zones (SEZS) Policy has been adopted.

Eleventh Five-Year Plan (2007 – 2012)

The Eleventh Plan document entitled “Towards faster and more Inclusive Growth” gave priority to agriculture, irrigation, and water resources, education, health, infrastructure, and employment, along with programs for SCs/STs, other backward classes, minorities, women and children. Government has realized that in recent years although economics growth has accelerated but it has failed to be ‘inclusive’.

Twelfth Five-Year Plan (2012 – 2017) and Niti Ayog

This Plan was approved on October 4, 2012. The objective of this Plan was “Faster, more inclusive and sustainable Growth”. The target of the growth rate was 8 %. The twelfth five year plan was the last plan to be implemented. It ended on march 31, 2017.

The Niti Ayog (National Institute for Transforming India) was founded on January 1, 2015. It replaced the planning commission. The tree-year agenda is further divided into seven parts, with a number of specific action points for each part to boost economic growth. The key feature of this document is to reduce fiscal deficit to 3 % by 2018 – 2019 and revenue deficit to 0.9 % of the GDP by 2019 – 2020.

10.7.2

Industrial Policy

The first industrial policy was announced by the government of India on 6 April, 1948. In this policy both the public and private sectors were involved towards industrial development.

Industrial policy, 1991 – A major shift in the industrial policy was made by the congress Government, led by Shri. P.V Narasimha Rao on 24 July, 1991. The main aim of this policy was to unshackle the country’s industrial economy from the cobwebs of unnecessary bureaucratic control, induced liberalization with a view to integrate the Indian economy with the world economy, to remove restrictions on direct foreign investment and also to free the domestic entrepreneur from the restriction of MRTP (Monopolies and Restrictive Practices Act.).

Drug Policy – The salient features of the modified drug policy (1986) as announces on 15 September.

Pharmaceutical Policy, 2002 – The first pharmaceutical policy – ‘Drug Policy’ was drafted in 1978. The government of India announced the New Pharmaceutical Policy 2002.

10.7.3

Industrial Regions of India

Delineation of Industrial regions empirically has been attempted by a number of geographers. The parameters used by them, however, differ from each other. It was Trewartha and Burner (1944) who divided India into industrial regions. Subsequently, P.P Karan and W.M. Jankrins (1959) demarcated the industrial regions of India. Industrial region of India were also delineated by Spencer and Thomas (1968), R.L. Sing (1971), B.N. Sinha (1972), M.R. Chaudhary (1976), and the centre for monitoring Indian Economy (1971,1982) CMIE.

Picture – (Industrial regions)**The Major industrial regions**

1. The Mumbai – Pune Industrial Region.
2. The Kolkata Hugli Industrial Region
3. The Ahmedabad – Vadodra Industrial Region
4. The Madurai – Coimbatore – Bangalore Industrial Region.
5. The Chotanagpur Industrial Region
6. The Agra – Delhi Kalka – Saharanpur Industrial Region

Minor industrial regions

- (i). Kanpur – Lucknow Industrial Region.
- (ii). Assam Valley Industrial Region.
- (iii) Darjeeling – Siliguri Industrial Region.
- (iv) North Bihar and Eastern Uttar Pradesh Industrial Region.
- (V) Indore – Ujjain Industrial Region.
- (vi) Amritsar – Jalandhar – Ludhiana Industrial Region.
- (vii) Nagpur – Wardha Industrial Region.
- (Viii) Godavari – Krishna Delta

PREVIOUS YEAR QUESTIONS**Sub Unit – 7****December - 14**

1. Given below are two statements, one labelled as **Assertion (A)** and the other labelled as **Reason (R)**. Select the correct answer from the codes given below :

Assertion (A) : Bangaluru has grown into the hub of information technology and ITES.

Reason (R) : City is provided with world class infrastructure, power supply and security.

Codes :

- (A) Both (A) and (R) are correct and (R) is the correct explanation of (A).
- (B) Both (A) and (R) are correct, but (R) is not the correct explanation of (A).
- (C) (A) is correct, but (R) is false.
- (D) (A) is false but (R) is correct.



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Answer with Reference

SL. NO.	QUESTION NO.	ANSWER	REFERENCE NO.
1.	58	A	10.7.3



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July - 16

1. Which one of the following industries is called as heavy engineering industry ?

- (A) Heavy Electricals
- (B) Heavy Machinery
- (C) Glass
- (D) iron and Steel



teachinns
Text with Technology

Answer with Reference

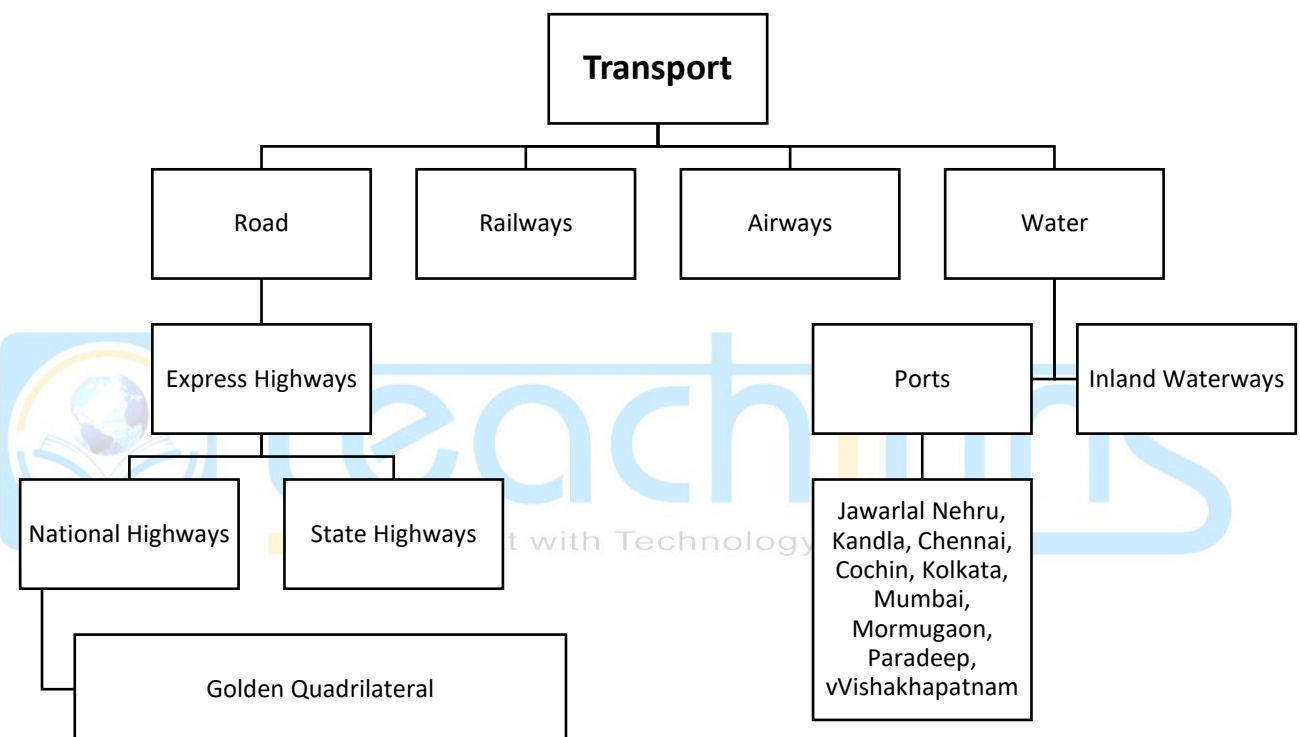
SL. NO.	QUESTION NO.	ANSWER	REFERENCE NO.
1.	30	B	10.7.3



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SUB UNIT-8**10.8.1****Transport Communications and Trade**

Transport – Provisions of quality and efficient infrastructure services are essential to realise the full potential of growth impulses surging through the economy.



Roads –

India is second largest road network in the world with an aggregate distance of 4.3 millions km (India 2016, p 789).

Highways and Roads –

1. National Highways – The central Government is responsible for the development and maintenance of the National Highways System. The National Highways of India have been shown in : The total length of the National Highways in 2017 was 115,435 km.

2. Golden Quadrilateral –

The National Highways Development Project (NHDP) has taken up a massive programme of road building in the country. Launched in January 1999, the Golden Quadrilateral (GQ) project is perhaps one of the largest projects of road building in the country with a length of 5846 km.

Golden Quadrilateral Corridor and its Length

Delhi – Mumbai – 1419 km

Mumbai – Chennai – 1290 km

Kolkata – Chennai – 1684 km

Delhi – Kolkata – 1453 km

10.8.2 India – some of the important National Highways and their Lengths

NH NO	Route	Length (in km)
44 (old NH 7)	3745	Srinagar – Kanyakumari
27	3507	Porbandar – Silchar
48 (old NH 8)	2807	Delhi – Chennai
52	2317	Hisar, jaipur, Kota, Indore, Dhule, Aurangabad, Bijapur, Hubli
30	2010	Sitarganj (Uttarakhand) – Ibrahimpatnam in Andhra Pradesh
6	1873	Jorabat (Meghalaya) Shillong (Mizoram)
53	1781	Hazira (Gujarat) – Pradip port (Odisha)
16 (old NH 5)	1659	Part of Golden Quadrilateral West Bengal – Andhra Pradesh
66 (old NH 17)	1593	Panvel - Kanyakumari
19 (old NH 2)	1435	De3lhi – Kolkata (has historical part of Grand Trunk Road)
34	1426	Gangotri Dam (Uttarakhand) – Lakhnadon (Jabalpur)
2	1214	Dibrugarh, Assam, Nagaland, Manipur, Mizoram (second longest in North Eastern Region)
13 (old NH 229)	1150	Tawang (Arunachal Pradesh) to Pasighat (Assam)
47	1080	Bamanbore (Gujarat) Nagpur (Maharashtra)
31	968	Uttar Pradesh – West Bengal

Rail Transport –

India has the third largest rail network in the world (66,000 route kms), after the USA (224,792 km), China (98,000).

Railway Management –

The entire railway system is managed by the Railway Board. The railway network has been divided into 16 railway zones which are subdivided into divisions. These divisions are the basic operating units for the Indian railways.

Water Transport –

Waterways are the cheapest means of transportation.

Ports – There are 13 major and 200 minor ports in India.

Major sea ports of India – The major sea ports of India are:

1. Chennai, 2. Cochin, 3. Ennore, 4. Jawarlal Nehru Port (Nhava Sheva), 5. Kandla, 6. Kolkata / Haldia, 7. Mormugao, 8. Mumbai, 9. New Mangalora, 10. Paradeep, 11. New Tuticorin, 12. Vishakhapatnam.

Pipelines Transportation

Pipeline provide the most convenient mode of transport of crude – oil, petroleum, products, natural gas and solid minerals.

Advantages of Pipelines –

The main advantages of pipeline are given below –

1. Pipelines can be laid through rough and mountainous terrain as well as under water.
2. The operating and maintenance cost of pipelines are lower than that of other modes of transportation.
3. Pipelines involve low energy consumption.
4. The industrial regions are well integrated by pipeline construction.
5. Pipelines are free from bottlenecks due to poor conditions.
6. They are not affected by strikes.
7. They do not pollute the environment.

Disadvantages of Pipelines –

1. Construction of pipelines is a very expensive and demand heavy investment.
2. The capacity of pipeline cannot be increased.
3. The repair of pipeline is highly technical and difficult.
4. Security threats from terrorist.

10.8.3**International Trade**

A flow of commodities from producers to consumers is known as trade. It is an important tertiary sector of economy which is carried out at the local, regional, national and international levels.

India's Foreign Trade (in Rupees Crore)

Year	Exports	Imports	Total Trade	Trade Deficit
1950-51	606	608	1214	-2
1960-61	642	1122	1764	-480
1970-71	1535	1634	3169	-99
1980-81	6710	12549	19259	-99
1990-91	32,558	43,193	75,751	-10,635
2000-01	203,571	230,873	434,444	-27,302
2008-09	696,498	870,399	1,566,897	-173,901
2014-15	1,896,348	2,737,087	4,633,435	-840,738

India – Commodity Composition of Exports –

Commodity Group	Percentage Share 2016-17
I - Primary Product	15.4
i) Agriculture and allied	10.2
ii) Ores and minerals	5.2
II – Manufactured Goods	65.7
iii) Engineering Goods	20.7
iv) Gems and jewellery	15.1
v) Textile including RMG	14.5
vi) Chemicals and related products	11.6
vii) Leather and manufactures	02.6
viii) Handicrafts including hand – made - carpets	01.2
III – Petroleum, crude and products (including coal)	11.5
IV - others	07.4
Total	100.00

PREVIOUS YEAR QUESTIONS**Sub Unit – 8****December - 14**

1. Given below are two statements, one labelled as **Assertion (A)** and the other labelled as **Reason (R)**. Select the correct answer from the codes given below :

Assertion (A) : The Golden Quadrilateral Express Highway is the visionary project to facilitate India joining the group of Developed Countries of the World.

Reason (R) : GQEH greatly reduced time distance in flow of transport and commodities and boosted urban growth and non-primary activities.

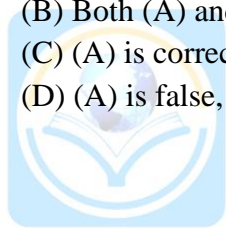
Codes :

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

(B) Both (A) and (R) are correct, but (R) is not the correct explanation of (A).

(C) (A) is correct, but (R) is false.

(D) (A) is false, but (R) is correct.



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Answer with Reference

SL. NO.	QUESTION NO.	ANSWER	REFERENCE NO.
1.	59	D	10.8.1



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July - 16

1. Which one of the following factors is not a reason for government to concentrate on transport policies ?

- (A) Social
- (B) Economic
- (C) Cultural
- (D) Political

2. Which one of the following is the largest shipbuilding with in India ?

- (A) Cochin Shipyard
- (B) Hindustan Shipyard
- (C) Goa Shipyard
- (D) Garden Reach Shipyard



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Answer with Reference

SL. NO.	QUESTION NO.	ANSWER	REFERENCE NO.
1.	29	C	10.8.1
2.	62	A	Cochin Shipyard is the largest shipbuilding with in India



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November - 17

1. National Highway No. 48 in India passes through which of the places ?

- (A) Pune, Bengaluru, Chennai
- (B) Pune, Goa, Coimbatore
- (C) Agra, Bhopal, Mumbai
- (D) Pune, Surat, Ahmedabad



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Answer with Reference

SL. NO.	QUESTION NO.	ANSWER	REFERENCE NO.
1.	41	A	10.8.2



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SUB UNIT-9

Regional Development and Planning

10.9.1 Regional Planning

Planning is a process to achieve certain objectives and goals. In fact, it is a process of human thought, and action based upon that through. Planning is believed to be related fundamentally to human beings, their behaviour, their aspirations, their thoughts, and their abilities.

Regional Planning is neither economic planning, nor physical planning alone. It is a synthesis of physical, social, economic, political, and cultural interests of the concerned region. It has to deal with the concerned region not in isolation, but in integration with other regions constituting the regional space as a whole. It may be at the macro, meso or micro level. It varies both in time and space.

Principles of regional Planning

The principles of regional planning are –

- 1) The principle of vertical unity of phenomena.
- 2) The principle of Horizontal spatial unity.
- 3) The principle of space-time continuum.
- 4) The principle of comprehensive Development.
- 5) The principle of community Development.
- 6) The principle of Equilibrium between social Desirability and Economic Viability.
- 7) The principle of Ecological Equilibrium.

10.9.2 Integrated Area Development

The concept of integrated area development is difficult to define. It has different meanings and interpretations at different points of time. In fact, it is difficult to decide what type of integration should be sought and what ways should be adopted to accomplish it. In general, four aspects of integration can be differentiated.

10.9.3 Development of Backward Areas

Identification of backward area is a difficult task. In general, any area with relatively low per capita income and low per capita consumption is known as backward area. At the time of formulation of the Fourth Five-Year Plan (1966 – 1971), the planning commission appointed a study Group to suggest the criteria for identifying backward areas. The group suggested the following criteria for the identification of backward area –

- 1) Total Population and the density of Population.
- 2) Number of workers engaged in agricultural including agricultural labourers as percentage, to total workers.
- 3) Total area per agricultural worker.
- 4) Net area sown per agricultural worker.
- 5) Percentage of total irrigated area, to net irrigated area.
- 6) Percentage of area sown more than once to net sown area.
- 7) Per capita (rural population) gross value of agricultural output.
- 8) Establishments (manufacturing and repair) using electricity –
 - i) Total.
 - ii) Household.
 - iii) Non-household.
- 9) Number of workers per lakh of population employed in registered factories
- 10) Mileage of surface roads
 - i) Per 100 sq km.
 - ii) Per lakh of population.
- 11) Number of commercial vehicles registered in a district.
- 12) Percentage of literate population.
- 13) Percentage of school going children –
 - i) Boys and
 - ii) Girls
- 14) Number of seats per million population for technical training –
 - i) Craftsmen and
 - ii) Diploma level
- 15) Hospital beds per lakh of population.
- 16) Per capita income.

10.9.4 Command Area Development

The command Area Development programme was launched in 1974 – 1975 with set objectives of improving the utilisation or created irrigation potential and optimising agriculture production and productivity from irrigated agriculture through a multi-disciplinary team under an Area Development Authority. It is about the command areas of the major and medium irrigation projects in the country.

The programme was restructured and termed as “command Area Development and Water Management (CADWM) programme” from 1 April 2004.

According to the census of India 2011, the total population of the scheduled tribes was 84.3, million or 8.6% of the total population of India. The Government of India has included 427 communities in the scheduled tribes, given in the Eighth schedule of the constitution of India.

10.9.5 Desertification and Desert Development Programme

The term desertification was coined by the French forester Aubreville in 1949 to describe land degradation. Since then there have been over 100 published definitions of this controversial term which gained prominence after the 1977 UN conference on Desertification. The term has been confused with drought in some circles, and its social impacts have sometimes been associated with famine that may in fact have non-environmental causes.

10.9.6 Human Development Index

The Human Development Index (HDI) is a statistic composite index of life expectancy, education, and per capita income indicators, which are used to rank countries into four tiers of human development. A country scores a higher HDI when the lifespan is higher, the education level is higher, and the gross national income per capita is higher. It was developed by Pakistani Economist Mehbub ul Haq (1990) and Indian Economist Amartya Sen.

Rank	State/Union Territory	HDI
1	Kerala	0.785
2	Chandigarh	0.774
3	Goa	0.764
4	Lakshadweep	0.749
5	Delhi	0.744
6	Andaman Nicobar Island	0.742
7	Puducherry	0.739
8	Punjab	0.721
9	Himachal Pradesh	0.720
10	Sikkim	0.716
11	Tamil Nadu	0.708
12	Daman and Diu	0.706
13	Haryana	0.704
14	Mizoram	0.697
15	Maharashtra	0.695
16	Manipur	0.695
17	Jammu and Kashmir	0.684
18	Karnataka	0.682
19	Uttarakhand	0.677
20	Nagaland	0.667
21	Gujarat	0.664
22	Telangana	0.661
23	Dadra and Nagar Haveli	0.658
24	Arunachal Pradesh	0.655
25	Tripura	0.655
26	Meghalaya	0.650
27	Andhra Pradesh	0.643
28	West Bengal	0.637
29	Rajasthan	0.621
30	Assam	0.605
31	Chhattisgarh	0.600
32	Odisha	0.597
33	Madhya Pradesh	0.594
34	Jharkhand	0.589
35	Uttar Pradesh	0.583
36	Bihar	0.566

The annual HDI 2019 report, released on December 9, 2019 rank in India at the 129 th position out of 189 countries, 1st rank Norway 0.954

PREVIOUS YEAR QUESTIONS**Sub Unit – 9****December - 14**

1. Match the following **List – I** with **List – II** and select the correct answer from the codes given :

List – I
(Planning Programmes)

- a. Metropolitan Planning
- b. Tribal Area Planning
- c. J.N.U.R.M.
- d. River Basin Planning

List – II
(Associated Features)

- i. Command area
- ii. Upgradation of urban infrastructure
- iii. Social and cultural sensibility
- iv. Green belt

Codes :

- | | (a) | (b) | (c) | (d) |
|-----|-----|-----|-----|-----|
| (A) | i | ii | iii | iv |
| (B) | iv | iii | i | ii |
| (C) | iii | iv | ii | i |
| (D) | iv | iii | ii | i |

2. Which one of the following suggested new method to measure regional imbalances in development and allocation of funds to different states of India ?

- (A) A. Mitra
- (B) Ashok Dutta
- (C) Raghu Rajan
- (D) A. Kundu

Answer with Reference

SL. NO.	QUESTION NO.	ANSWER	REFERENCE NO.
1.	54	D	10.9.1
2.	55	D	10.9.1



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June - 15

1. In which part of India Dandakaranaya is situated ?

- (A) North Eastern
- (B) South Eastern
- (C) Central
- (D) Northern



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Answer with Reference

SL. NO.	QUESTION NO.	ANSWER	REFERENCE NO.
1.	41	C	10.9.1



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December - 15

1. In which year a major earthquake occurred in Jammu and Kashmir region near Muzaffarabad ?

- (A) 2005
- (B) 1905
- (C) 2001
- (D) 2013

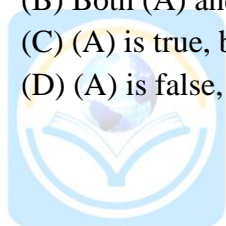
2. Given below are two statements, one labelled as **Assertion (A)** and other labelled as **Reason (R)**. Select your answer from the codes given below :

Assertion (A) : Indian economy is diversifying its base towards non-primary activities.

Reason (R) : During Post-Independence period service sectors are slowly but gradually increasing its contribution to Gross Domestic Products in India.

Codes :

- (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 true, but (R) is false
- (D) (A) is false, but (R) is true



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Answer with Reference

SL. NO.	QUESTION NO.	ANSWER	REFERENCE NO.
1.	45	A	10.10.1
2.	61	A	



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July - 16

1. The surveys that are conducted to identify deteriorated or deficient area in development are termed as

- (A) Socio-economic surveys
- (B) Structural surveys
- (C) Environmental Quality surveys
- (D) Diagnostic surveys

2. Which one of the following indicators is not concerned with Human Development Index (H.D.I.) ?

- (A) Life expectancy at birth
- (B) Social overhead capital
- (C) Educational attainment
- (D) Standard of living



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Answer with Reference

SL. NO.	QUESTION NO.	ANSWER	REFERENCE NO.
1.	39	D	10.9.1
2.	57	B	10.9.6



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January - 17

1. Match **List – I** with **List – II** and select the correct answer using the codes given below :

List – I
(Macro Economic regions by Bhatt)

- I. Southern
- II. North-Central
- III. Eastern
- IV. Western

List – II
(Group of States)

- A. Maharashtra and Gujarat
- B. Bihar, Odisha, West Bengal and Assam
- C. Mysore, Tamil Nadu and Andhra Pradesh
- D. Uttar Pradesh and Madhya Pradesh

Codes :

- | | (a) | (b) | (c) | (d) |
|-----|-----|-----|-----|-----|
| (A) | ii | iv | iii | i |
| (B) | iii | ii | iv | i |
| (C) | iv | iii | i | ii |
| (D) | iii | iv | ii | i |

2. Which one of the following authors used 1961 Census of India data to group the seven industrial categories of workers (excluding the first two categories representing the agricultural sector) into the functional types of manufacturing town, trade and transport town and service towns ?

- (A) Amrit Lal
- (B) Qazi Ahmed
- (C) Ashok Mitra
- (D) S.M Rafiullah

Answer with Reference

SL. NO.	QUESTION NO.	ANSWER	REFERENCE NO.
1.	35	D	10.9.1
2.	38	C	10.9.1



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SUB UNIT-10

10.10.1 Environmental Hazards

Most of the environmental hazards are natural hazards such as earthquakes, volcanoes, landslides, hurricanes, cyclones, typhoons, tornadoes, lightning, tsunami, floods, droughts, and epidemics.

Earthquakes

Earthquakes are the most important cause of landslides in the folded mountainous areas (Himalayas, etc.). In India, landslides are more frequent in the Folded Mountains of the Tertiary period. In the Kashmir valley, earthquake of 1905 resulted into landslides in the lesser and the Greater Himalayas in which several thousand people lost their lives.

Tsunami

A tsunami is a series of waves created when a body of water, such as ocean, is rapidly displaced. Earthquakes, mass movements above or below water, volcanic eruption and other underwater explosions, landslides, underwater earthquakes, large meteorites or asteroid impacts, and testing with nuclear weapons at sea all have potential to generate a tsunami.

Floods

A high water level that overflows the natural banks along any portion of a stream is called flood. Thus, floods are commonly associated with a stream or river.

Droughts

Occurrence of substantially lower than average precipitation in a season that normally has ample precipitation in a season for the support of cereal and non-cereal crops is known as a drought.

Cloudburst

Cloudburst is a sudden rainfall which can be quite unexpected, very abrupt, characterised with flash floods. In other words, cloudburst is an extreme amount of precipitation, sometimes with hail and thunder which normally lasts no longer than a few minutes but is capable of creating have condition of flood, landslides, avalanches, mudflow, earth-flow, rock-fall, subsidence, slumps, soil-creep and mass wasting.

Cloudburst or Himalayan Tsunami in Uttarakhand

Uttarakhand the above of gods with its magnificent snow-covered peaks, pristine forests and awe-inspiring rivers is a sacred place in India culture. Millions of pilgrims and tourists visit the state of Uttarakhand every year, especially during the summer season. Despite all these attractions, the state of Uttarakhand has a highly vulnerable ecosphere. There are sudden cloudburst, flash floods, landslides, avalanches, rock fall, soil creep and mass wasting.

The cloudburst of 16th June, 2013 has been termed by the experts as the Himalayan Tsunami.

10.10.3 Globalization And Indian Economy

The concept of globalization was introduced in the Indian economy in July 1991. It was a part of the structural adjustment package during the period of the government of Prime Minister Narasimha Rao. The government soon applied for a loan of \$2.3 billion from the International Monetary Fund (IMF) and began fulfilling the anticipatory conditionalities, including two successive devaluations and withdrawal of export subsidies, to smoothen the passage of the application (Agarwal led, 1995, P.182). The annual budget of July 1991 fully reflected the structural adjustment package, which came to be known as the New Economic Policy (NEP).

Liberalization of economy means freedom of the producing units from direct or physical controls by the government.

PREVIOUS YEAR QUESTIONS**Extra****December - 14**

1. Given below are two statements, one labelled as **Assertion (A)** and the other labelled as **Reason (R)**. Select the correct answer from the codes given below :

Assertion (A) : Women status in the North-Eastern States of India is encouraging.

Reason (R) : Participation of women in economic activities in these States is quite good.

Codes :

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

(B) Both (A) and (R) are correct, but (R) is not the correct explanation of (A).

(C) (A) is correct, but (R) is false.

(D) (A) is false, but (R) is correct.



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Answer with Reference

SL. NO.	QUESTION NO.	ANSWER	REFERENCE NO.
1.	67	A	Women Status in the north –eastern states of India is encouraging for Participation of women in economic activities in these States is quite good.



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June - 15

1. Who has designed the plan of Chandigarh City ?

- (A) Ernst May
- (B) Le Corbusier
- (C) Soria Y Matte
- (D) Charles Edward Jeanneret



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Answer with Reference

SL. NO.	QUESTION NO.	ANSWER	REFERENCE NO.
1.	40	B	Chandigarh is the planed city in India which is the designed by le Corbusier.



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July - 16

1. In which of the following years, India became the 7th largest manufacturer of vehicles in the world ?

- (A) 2007
- (B) 2008
- (C) 2009
- (D) 2010

2. In which one of the following years, Kisan Call Centres were established to promote agricultural efficiency to a great extent ?

- (A) 2000
- (B) 2002
- (C) 2004
- (D) 2006

3. The famous Makrana marble mines are located in which of the following Indian States ?

- (A) Gujarat
- (B) Rajasthan
- (C) Madhya Pradesh
- (D) Maharashtra

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Text with Technology

Answer with Reference

SL. NO.	QUESTION NO.	ANSWER	REFERENCE NO.
1.	42	C	India became the 7 th largest manufacturer of vehicles ,2009
2.	63	C	Kisan call center were established,2004
3.	62	B	Rajasthan is famous for makrana marble



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January- 17

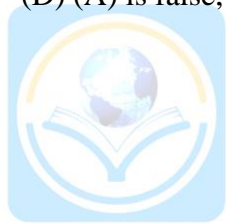
1. Given below are two statements, one labelled as **Assertion (A)** and the other labelled as **Reason (R)**. Select your answer from the codes given below :

Assertion (A) : India is a multi-religious and multi-ethnic society.

Reason (R) : The constitution of India offers to all citizens, individually and collectively, fundamental rights without discrimination on grounds of religion, race, caste, sex or place of birth.

Codes :

- (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 true, but (R) is false.
- (D) (A) is false, but (R) is true.



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Answer with Reference

SL. NO.	QUESTION NO.	ANSWER	REFERENCE NO.
1.	65	B	India is a multi-religious and multi ethnic society and the constitution of India offers to all citizens fundamental rights without discrimination on grounds of religion, race, caste, sex or place of birth.



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