FIRST PAPER (PART-B)
UNIT- 2
GEOGRAPHY OF INDIA

1. What is the east-west and north-south extent of mainland India?

East-West Extent of Main Land India (Including Pak occupied Kashmir-POK):	68° 7′ east to 97° 25′ east longitude
South-North Extent of Main Land India:	8° 4′ north to 37° 6′ north latitude
Locational Extent:	8° 4′ N to 37° 6′ N latitude and 68° 7′ E to 97° 25′ E longitude.

2. Write an introduction about the extension of geography of India?

- The southernmost point of the country is the Pygmalion Point or Indira Point is located at 6° 45′ N latitude.
- North-South extent from Indira Col in Kashmir to Kanyakumari is 3,214 km.
- East-West width from the Rann of Kachachh to Arunachal Pradesh is 2,933 km.
- With an area of 32,87,263 sq km, India is the seventh largest country of the world.
- India accounts for about 2.4 per cent of the total surface area of the world.

3. Why India is treated as tropical country?

- The country is separated from the rest of Asia by Himalayas.
- Its climate is dominated by the tropical monsoons and the temperate air masses are blocked by Himalayas.
- The entire area south of the Himalayas is essentially tropical from climatic point of view although the night temperatures in winter at several places in North India may come down to the level of those prevailing in temperate lands, yet clear skies and intense insolation raise the day temperatures to a tropical level.

4. Write in brief about India's frontier?

- India has 15106.7 Km of land border running through 92 districts in 17 States and a coastline of 7516.6 Km (6100 km of mainland coastline + coastline of 1197 Indian islands) touching 13 States and Union Territories (UTs).
- Barring Madhya Pradesh, Chhattisgarh, Jharkhand, Delhi, Haryana and Telangana, all other States in the country have one or more international

borders or a coastline and can be regarded as frontline States from the point of view of border management.

- India's longest border is with Bangladesh while the shortest border is with Afghanistan.

5. Write down the major physical division of India?

- The Himalayas (young fold mountains),
- Indo-Gangetic Plain (monotonous topography– featureless topography),
- The Peninsular Plateau (one of the most stable landmasses and one of the oldest plateaus of the world)
- Coastal Plains (Sediments due to fluvial action).
- The Indian Islands (Coral Islands = coral reef built up on atolls – Lakshadweep. Tectonic = Andaman and Nicobar Islands – Interaction between Indian Plate and Eurasian plate).

6. Provide a description about Peninsular Plateau?

- It Includes the entire South India, Central India, Aravalis, Rajmahal hills, Meghalaya plateau, Kuchchh- Kathiawar region (Gujarat) etc.
- It is the oldest and the most stable landmass of India.
- It is volcanic in origin, made up of horizontal layers of solidified lava forming trap structure with step-like appearance.
- It is suitable for the cultivation of cotton, home to rich mineral resources and a source to generate hydroelectric power.
- It is roughly triangular in shape with its base coinciding with the southern edge of the great plain of North India and apex of the triangular plateau is at Kanyakumari.

7. Write an account of geographical feature of Himalayas?

- Includes the Himalayas, Purvanchal and their extensions Arakan Yoma (Myanmar) and Andaman and Nicobar Islands (but we will consider these as islands only).
- It is the youngest and highly unstable landmass of India. (Continent – Continent Convergence)
- Tectonic movements are very common.
- It is mostly formed of sedimentary and metamorphic rocks, it has been subjected to intense folding and faulting.
- The high altitude of Himalayas blocks cold continental air masses of Central Asia from entering India.

8. India is divided in how many physiographic divisions?

- The elevated Peninsular region.
- The mighty Himalaya and their associated young folded mountain.
- The Indo-Gangetic-Brahmaputra Plains
- The Deserts
- The Coastal Plains and Islands.

9. Write the geographic and its extension in India distribution of Himalayas?

- The Himalayas consist of four litho tectonic mountain ranges, they are:
  1. The Trans-Himalaya or the Tethys Himalaya.
  2. The Great Himalaya
  3. The Lesser Himalaya
  4. The Shiwalik or Outer Himalaya.
- The Indian Himalaya extend from the eastern boundary of Pakistan to the border of Myanmar for about 2500 km with a varying width of about 500 km in the west and about 320 km in the east.
- They lies to the north of the Ganga-Brahmaputra Plains are separated from the plains by the Himalayan Front Fault (HFF).
- They include parts of Jammu and Kashmir, Himachal Pradesh, Uttarkhand, Nepal, Sikkim, Bhutan and Arunachal Pradesh.
- Their offshoots run in a north-south direction along the India- Myanmar boundary through Nagaland, Manipur and Mizoram.

10. Explain the origin of Himalaya on the basis of Geosynclinals Origin?

- Himalayan mountains have come out of a great called the Tethys sea and that the uplift has taken place in different phases.
- This sea was occupying the region of Himalaya during the Mesozoic Era.
- The Tethys almost girdled the whole Earth running from Europe in the west to china in the east.
- The 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 bad.
- During the cretaceous period, the bed of the sea started rising which led to the folding of three successive ranges of Himalaya.

11. Write short note on 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 6100m
- Almost all the lofty peaks of the Himalaya like Mt. Everest, Kanchanjunga, Nanga-Prabat, Nanda-Devi, Manaslu etc. lies in this zone.
- It is composed of crystalline, igneous or metamorphic rocks.

12. Write a note on the features of Indo-Gangetic Plain?

- It lies between Peninsular and Himalayan region.
- Most youthful, monotonous (lack of change or variety) region prone to tectonic forces.
- The ganga along with its tributaries originating in the Himalayas have brought large quantities of alluvium from build this extensive plain.
- The general slope of the entire plain is to the east and south-east.

- Rivers flow sluggishly in the lower section of Ganges as a result of which the area is marked by local prominence such as levees, bluffs, oxbow lakes, marshes ravines etc.

13. Examine the significance of coastal plains?

- The coastal plains are agriculturally very productive.
- Western coast grows specialized tropical crops while eastern coasts witnessed green revolution in rice.
- The delta regions of eastern coastal plains have a good network of canals across the river tributaries.
- Coastal plains are source of salt, monazite, mineral oil and gas as well as are centres of fisheries.
- Although lacking in adequate natural harbours, the coastal plains have number of major and minor ports.

14. Write a short note on the Indian Islands?

- It consists of two major groups – Lakshadweep and Andaman and Nicobar Islands.
- **Lakshadweep** (Hotspot) are group of atolls occupied by coral reefs. No significant volcanism or tectonic activity in recent past. Highly vulnerable to sea-level rise.
- **Andaman and Nicobar Islands**– Continuation of ArakanYoma. Has active volcanoes and is tectonically active.
- The Andaman and Nicobar Island have Tropical weather moderated by cooling effect of the ocean.

15. Write the Division of the Himalayas?

- Shiwaliks or outer Himalayas
- Lesser or Middle Himalayas
- The Greater Himalayas
- The Trans-Himalayas – Tibetan Himalayas.
- The Eastern Hills – Purvanchal: A chain of hills in North-East India.

16. Discuss some important features of Himalayan Ranges?

- It is a series of several parallel or converging ranges.
- The ranges are separated by deep valleys creating a highly dissected topography (of a plateau or upland) divided by a number of deep valleys).
- The southern slopes have steep gradients and northern slopes have comparatively gentler slopes.
- Most of the Himalayan ranges fall in India, Nepal and Bhutan. The northern slopes are partly situated in Tibet (trans-Himalayas) while the western extremity lies in Pakistan, Afghanistan and Central Asia.
- Himalayas between Tibet and Ganga Plain is a succession of three parallel ranges.

17. Write an account on Shivalik Range?

- It is also known as Outer Himalayas and located in between the Great Plains and Lesser Himalayas.
- The altitude varies from 600 to 1500 metres. Runs for a distance of 2,400 km from the Potwar Plateau to the Brahmaputra valley.

- They are almost unbroken chain of low hills except for a gap of 80-90 km which is occupied by the valley of the Tista River and Raidak River.
- Shiwalik range from North-East India up to Nepal are covered with thick forests but the forest cover decreases towards west from Nepal.
- The southern slopes of Shiwalik range in Punjab and Himachal Pradesh are almost devoid of forest cover. These slopes are highly dissected by seasonal streams called **Chos.**

18. Explain the formation of Duns (Duras)?

- Shiwalik Hills were formed by the accumulation of conglomerates (sand, stone, silt, gravel, debris etc.).
- These conglomerates, in the initial stages of deposition, obstructed the courses of the rivers draining from the higher reaches of the Himalayas and formed temporary lakes.
- With passage of time, these temporary lakes accumulated more and more conglomerates. The conglomerates were well settled at the bottom of the lakes.
- When the rivers were able to cut their courses through the lakes filled with conglomerate deposits, the lakes were drained away leaving behind plains called 'duns' or 'doons' in the west and 'duars' in the east.
- Dehra Dun in Uttarakhand is the best example of it.
- Kotah, PatliKothri, Chumbi, Kyarda, Chaukhamba, Udhampur and Kotli are other important duns.

19. Provide a description about Middle or the Lesser Himalaya?

- It lies In between the Shiwaliks in the south and the Greater Himalayas in the north.
- Runs almost parallel to both the ranges.
- It is also called the Himachal or Lower Himalaya.
- Lower Himalayan ranges are 60-80 km wide and about 2400 km in length.
- Elevations vary from 3,500 to 4,500 m above sea level.
- Lower Himalayas have steep, bare southern slopes (steep slopes prevents soil formation and more gentle, forest covered northern slopes).
- In Uttarakhand, the Middle Himalayas are marked by the Mussoorie and the Nag Tibba ranges.
- East of the Kosi River, the Saptkosi, Sikkim, Bhutan, Miri, Abor and Mishmi hills represent the lower Himalayas.

20. Highlight some important facts about the Pir Panjal range?

- The PirPanjal range in Kashmir is the longest and the most important range.
- It extends from the Jhelum river to the upper of Beas river for over 300 km.
- It rises to 5,000 metres and contains mostly volcanic rocks.

21. Write the features of the Greater Himalaya?

- It is also known as Inner Himalaya, Central Himalaya or Himadri.
- Average elevation of 6,100 m above sea level and an average width of about 25 km.
- It is mainly formed of the central crystallines (granites and gneisses) overlain by metamorphosed sediments (limestone).
- The folds in this range are asymmetrical with steep south slope and gentle north slope giving hog back (a long, steep hill or mountain ridge) topography.
- This mountain arc convexes to the south just like the other two.
- Terminates abruptly at the syntaxial bends. One in the Nanga Parbat in north-west and the other in the Namcha Barwa in the north-east.

22. Provide a detailed account of the Trans Himalayas?

- The Himalayan ranges immediately north of the Great Himalayan range.
- Also called the Tibetan Himalaya because most of it lies in Tibet.
- The Zaskar, the Ladakh, the Kailas and the Karakoram are the main ranges.
- It stretches for a distance of about 1,000 km in east-west direction.
- Average elevation is 3000 m above mean sea level.
- The average width of this region is 40 km at the extremities and about 225 km in the central part.
- The Nanga Parbat (8126 m) is an important range which is in The Zaskar Range.
- The Kailas Range (Gangdise in Chinese) in western Tibet is an offshoot of the Ladakh Range. The highest peak is Mount Kailas (6714 m). River Indus originates from the northern slopes of the Kailas range.
- The northern most range of the Trans-Himalayan Ranges in India is the Great Karakoram Range also known as the Krishnagiri range.

23. Describe Purvanchal or Eastern Hills in detail?

- Eastern Hills or The Purvanchal are the southward extension of Himalayas running along the north-eastern edge of India.
- At the Dihang gorge, the Himalayas take a sudden southward bend and form a series of comparatively low hills which are collectively called as the Purvanchal.
- Purvanchal hills are convex to the west.
- They run along the India-Myanmar Border extending from Arunachal Pradesh in the north to Mizoram in the south..
- Patkai Bum and Naga Hills form the watershed between India and Myanmar.
- The Barail range separates Naga Hills from Manipur Hills.

- Further south the Barail Range swings to west into Jaintia, Khasi and Garo hills which are an eastward continuation of the Indian peninsular block. They are separated from the main block by Ganga and Brahmaputra rivers.

24. Explain the Syntaxial bends of the Himalayas?

- Himalayas extend in the east-west direction from the Indus gorge in the west to the Brahmaputra gorge in the east.
- Himalayan ranges take sharp southward bends at these gorges. These bends are called syntaxial bends of the Himalayas.
- The western syntaxial bend occurs near the Nanga Parbat where the Indus river has cut a deep gorge.
- The eastern syntaxial bend occurs near the Namche Barwa.

25. What do you know about Punjab Himalayas?

- It lies in between the Indus and the Satluj rivers (560 km long).
- All the major rivers of Indus river system flow through Punjab Himalayas.
- A large portion of Punjab Himalayas is in Jammu and Kashmir and Himachal Pradesh. Hence they are also called the Kashmir and Himachal Himalaya.
- Karakoram, Ladakh, Pir Panjal, Zaskar and Dhaola Dhar are the major ranges in this section.
- The general elevation falls westwards.

26. Highlight some important features of Assam Himalayas?

- Spreads over Sikkim, Assam and Arunachal Pradesh.
- Elevation here is much lesser than that of the Nepal Himalayas.
- The southern slopes are very steep but the northern slopes are gentle.
- The Lesser Himalayas are very narrow and are very close to the Great Himalayas.

27. Examine the features of Western Himalayas?

- It lies in Between the Indus in the west and the Kali river in the east (880 km).
- It spread across three states of Jammu and Kashmir, Himachal Pradesh and Uttarakhand.
- It encompasses three physiographic provinces namely Kashmir Himalaya, Himachal Himalaya and Kumaon Himalaya (Uttarakhand Himalayas).
- The Ladakh plateau and the Kashmir valley are two important areas of the Kashmir Himalayan region.
- In Himachal Himalayas, The Greater Himalaya is represented by the Zaskar range, lesser Himalaya by PirPanjal and Dhauladhar ranges and the Outer Himalaya by the Shiwalik range.
- The southern slopes are rugged, steep and forested while the northern slopes are bare, gentle and show plains with lakes.
- The Kumaon Himalayas lie in Uttarakhand and extend from the Satluj to the Kali river.
- The Lesser Himalayas in Kumaon Himalaya is represented by the Mussoorie and Nag Tiba ranges.

28. Highlight some important Characteristics of Central Himalayas?

- It lies about 800 km in between river Kali in the west and river Tista in the east.
- The Great Himalaya range attains maximum height in this portion.
- Some of the world famous peaks Mt. Everest, Kanchenjunga, Makalu, Annapurna, Gosainthan and Dhaulagiri are located here.
- The range is crossed by rivers like Ghaghara, Gandak, Kosi, etc.
- In between the Great and the Lesser Himalayas, there are Kathmandu and Pokhra lacustrine valleys (previously, they were lakes).
- The Shiwalik range come very close to the lesser Himalaya towards the east and is almost non-existent beyond Narayani (Gandak).

29. Provide a description of Eastern Himalayas?

- This part of the Himalayas lies between the Tista river in the west and the Brahmaputra river in the east and stretches for a distance of about 720 km.
- It also known as the Assam Himalayas, the Eastern Himalayas occupy mainly the areas of Arunachal Pradesh and Bhutan.
- The Assam Himalayas show a marked dominance of fluvial erosion due to heavy rainfall.
- The Himalayas take a sudden southward turn after the Dihang gorge and the hill ranges running in more or less north-south direction along India's border with Myanmar are collectively known as the Purvanchal.

30. Write a note on Karewas?

- Karewas are lacustrine deposits (deposits in lake) in the Valley of Kashmir and in Bhadarwah Valley of the Jammu Division.
- These are the flat topped mounds that border the Kashmir Valley on all sides.
- They are characterized with fossils of mammals and at places by peat.
- The Karewas are devoted to the cultivation of saffron, almond, walnut, apple and orchards.
- The Karewas have been elevated, dissected and in great measure removed by denudation as well as by the Jhelum river giving them the present position.

31. Explain the Formation of Indo – Gangetic – Brahmaputra through?

- The rivers which were previously flowing into Tethys sea (Before Indian Plate collided with Eurasian Plate – continental drift, plate tectonics) deposited huge amount of sediments in the Tethys Geosyncline. (Geosyncline – a huge depression)
- Himalayas are formed out of these sediments which were uplifted, folded and compressed due to northern movement of Indian Plate.
- Northern movement of Indian Plate also created a trough to the south of Himalayas.

32. Discuss Features of Indo – Gangetic – Brahmaputra Plain?

- Indo-Gangetic-Brahmaputra Plain is the largest alluvial tract of the world.
- It stretches for about 3,200 km from the mouth of the Indus to the mouth of the Ganga. Indian sector of the plain accounts for 2,400 km.
- The northern boundary is well marked by the Shiwaliks and the southern boundary is a wavy irregular line along the northern edge of the Peninsular India.
- The western border is marked by Sulaiman and Kirthar ranges. On the eastern side, the plains are bordered by Purvanchal hills.
- The width of the plain varies from region to region. It is widest in the west where it stretches for about 500 km. Its width decreases in the east.
- The thickness of the alluvium deposits also vary from place to place.
- The cones or alluvial fans of Kosi in the north and those of Son in the south exhibit greater alluvial thickness while the intra-cone areas have relatively shallower deposits.

33. Describe the Bhabar region?

- It is a narrow, porous, northern most stretch of Indo-Gangetic plain.
- It is about 8-16 km wide running in east-west direction along the foothills (alluvial fans) of the Shiwaliks.
- They show a remarkable continuity from the Indus to the Tista.
- Rivers descending from the Himalayas deposit their load along the foothills in the form of alluvial fans.
- These alluvial fans have merged together to build up the bhabar belt.
- The porosity of bhabar is the most unique feature.
- The porosity is due to deposition of huge number of pebbles and rock debris across the alluvial fans.
- The streams disappear once they reach the bhabar region because of this porosity.

34. Provide a description about the Terai region?

- Terai is an ill-drained, damp (marshy) and thickly forested narrow tract to the south of Bhabar running parallel to it.
- The Terai is about15-30 km wide.
- The underground streams of the Bhabar belt re-emerge in this belt.
- The Terai is more marked in the eastern part than in the west because the eastern parts receive comparatively higher amount of rainfall.
- Most of the Terai land, especially in Punjab, Uttar Pradesh and Uttarakhand, has been turned into agricultural land which gives good crops of sugarcane, rice and wheat.

35. Write a short note on Rajasthan Plain?

- It is occupied by Thar or the Great Indian Desert.
- This plain is an undulating plain (wave like) whose average elevation is about 325 m above mean sea level.
- The desert region is called Marusthali and forms a greater part of the Marwar plain.
- It has a few outcrops of gneisses, schist's and granites which proves that geologically it is a part of the Peninsular Plateau. It is only at the surface that it looks like an aggradational plain.
- The eastern part of the Thar Desert up to the Aravali Range is a semi-arid plain known as Rajasthan Bagar.
- It is drained by a number of short seasonal streams originating from the Aravali and supports agriculture in some patches of fertile tracts.
- Luni is an important seasonal stream which flows into Rann of Kuchchh. The tract north of the Luni is known as thali or sandy plain.

36. Give an account on Punjab Plain?

- This plain is formed by five important rivers of Indus system.
- The plain is primarily made up of 'doabs'- the land between two rivers.
- The depositional process by the rivers has united these doabs giving an homogenous appearance.
- Punjab literally means "(The Land of) Five Waters" referring to the following rivers: the Jhelum, Chenab, Ravi, Sutlej, and Beas.
- The total area of this plain is about 1.75 lakh sq km.
- The average elevation of the plain is about 250 m above mean sea level.
- The eastern boundary of Punjab Haryana plain is marked by subsurface Delhi-Aravali ridge.
- The northern part of this plain (Shiwalik hills) has been intensively eroded by numerous streams called Chos.
- To the south of the Satluj river there is Malwa plain of Punjab.
- The area between the Ghaggar and the Yamuna rivers lies in Haryana and often termed as 'Haryana Tract'. It acts as water-divide between the Yamuna and the Satluj rivers.
- The only river between the Yamuna and the Satluj is the Ghaggar which is considered to be the present day successor of the legendary Saraswati River.

37. Describe Ganga Plain in brief?

- This is the largest unit of the Great Plain of India stretching from Delhi to Kolkata (about 3.75 lakh sq km).
- The Ganga along with its large number of tributaries originating in the Himalayans have brought large quantities of alluvium from the mountains and deposited it here to build this extensive plain.
- The peninsular rivers such as Chambal, Betwa, Ken, Son, etc. joining the Ganga river system have also contributed to the formation of this plain.
- The general slope of the entire plain is to the east and south east.
- Rivers flow sluggishly in the lower sections of Ganges as a result of which the area is marked by local prominences such as levees, bluffs, oxbow lakes, marshes, ravines, etc.
- Almost all the rivers keep on shifting their courses making this area prone to frequent floods. The Kosi river is very notorious in this respect. It has long been called the 'Sorrow of Bihar'.

38. Describe Brahmaputra Plain?

- This is also known as the Brahmaputra valley or Assam Valley or Assam Plain as most of the Brahmaputra valley is situated in Assam.
- Its western boundary is formed by the Indo-Bangladesh border as well as the boundary of the lower Ganga Plain. Its eastern boundary is formed by Purvanchal hills.
- It is an aggradational plain built up by the depositional work of the Brahmaputra and its tributaries.
- The innumerable tributaries of the Brahmaputra river coming from the north form a number of alluvial fans. Consequently, the tributaries branch out in many channels giving birth to river meandering leading to formation of bill and ox-bow lakes.
- There are large marshy tracts in this area. The alluvial fans formed by the coarse alluvial debris have led to the formation of terai or semi-terai conditions.

39. Discuss some of the Significance of the Plain?

- This one fourth of the land of the country hosts half of the Indian population.
- Fertile alluvial soils, flat surface, slow moving perennial rivers and favorable climate facilitate intense agricultural activity.
- The extensive use of irrigation has made Punjab, Haryana and western part of Uttar Pradesh the granary of India (Prairies are called the granaries of the world).
- The entire plain except the Thar Desert, has a close network of roads and railways which has led to large scale industrialization and urbanization.
- Cultural tourism: There are many religious places along the banks of the sacred rivers like the Ganga and the Yamuna which are very dear to

Hindus. Here flourished the religions of Budha and Mahavira and the movements of Bhakti and Sufism.

40. Discuss the Features of the Peninsular Plateau?

- Roughly triangular in shape with its base coinciding with the southern edge of the great plain of North India. Apex of the triangular plateau is at Kanyakumari..
- It covers a total area of about 16 lakh sq km (India as a whole is 32 lakh sq km).
- The average height of the plateau is 600-900 m above sea level (varies from region to region).
- Most of the peninsular rivers flow west to east indicating it's general slope.
- Narmada-Tapti are the exceptions which flow from east to west in a rift (rift is caused by divergent boundary (Go back to Interaction of plates).
- The Peninsular Plateau is a one of the oldest landforms of earth.

41. Describe Chhattisgarh Plain?

- The Chhattisgarh plain is the only plain worth the name in the Peninsular plateau.
- It is a saucer shaped depression drained by the upper Mahanadi.
- The whole basin lies between the Maikala Range and the Odisha hills.
- The region was once ruled by Haithaivanshi Rajputs from whose thirty six forts (Chhattisgarh) it derives its name.
- The basin is laid with nearly horizontal beds of limestone and shales.

42. Examine Ganga-Brahmaputra Delta?

- This is the largest delta in the world.
- The Ganga river divides itself into several channels in the delta area. The slope of the land here is a mere 2 cm per km. Two thirds of the area is below 30 m above mean sea level.
- The seaward face of the delta is studded with a large number of estuaries, mud flats, mangrove swamps, sandbanks, islands and forelands.
- Large part of the coastal delta is covered tidal forests. These are called the Sunderbans because of the predominance of Sundri tree here.

43. Throw light on the Marwar Plateau or Mewar Plateau?

- It is the plateau of eastern Rajasthan. (Marwar plain is to the west of Aravalis whereas Marwar plateau is to the east).
- The average elevation is 250-500 m above sea level and it slopes down eastwards.
- It is made up of sandstone, shales and limestones of the Vindhayan period.
- The Banas river, along with its tributaries (Berach river, Khari rivers) originate in the Aravali Range and flow towards northwest into Chambal river. The erosional activity of these rives make the plateau top appear like a rolling plain.

44. Discuss some important features of Central Highland

- It is also called the Madhya Bharat Pathar or Madhya Bharat Plateau.
- It is to the east of the Marwar or Mewar Upland.
- Most of plateau comprises the basin of the Chambal river which flows in a rift valley.
- The Kali Sindh, flowing from Rana Pratap Sagar, The Banas flowing through Mewar plateau and the Parwan and the Parbati flowing from Madhya Pradesh are its main tributaries.
- It is a rolling plateau with rounded hills composed of sandstone. .
- To the north are the ravines or badlands of the Chambal river (They are typical to Chambal river basin)

45. Write an account on Bundelkhand Upland?

- Yamuna river to the north, Madhya Bharat Pathar to the west, Vindhyan Scarplands to the east and south-east and Malwa Plateau to the south.
- It is the old dissected (divided by a number of deep valleys) upland of the 'Bundelkhand gneiss' comprising of granite and gneiss.
- Spreads over five districts of Uttar Pradesh and four districts of Madhya Pradesh.
- Average elevation of 300-600 m above sea level, this area slopes down from the Vindhyan Scarp toward the Yamuna River.
- The area is marked by a chain of hillocks (small hill) made of granite and sandstone.
- The erosional work of the rivers flowing here have converted it into an undulating (wave like surface) area and rendered it unfit for cultivation.
- Streams like Betwa, Dhasan and Ken flow through the plateau.

46. Highlight the characteristic of Malwa Plateau?

- The Malwa Plateau roughly forms a triangle based on the Vindhyan Hills, bounded by the Aravali Range in the west and Madhya Bharat Pathar to the north and Bundelkhand to the east.
- This plateau has two systems of drainage; one towards the Arabian sea (The Narmada, the Tapi and the Mahi), and the other towards the Bay of Bengal (Chambal and Betwa, joining the Yamuna).
- In the north it is drained by the Chambal and many of its right bank tributaries like the Kali, the Sindh and the Parbati. It also includes the upper courses of the Sindh, the Ken and the Betwa.
- It is composed of extensive lava flow and is covered with black soils.
- This is a rolling plateau dissected by rivers. In the north, the plateau is marked by the Chambal ravines.

47. Write the geographical features of Baghelkhand?

- North of the Maikal Range is the Baghelkhand.
- Made of limestones and sandstones on the west and granite in the east.
- It is bounded by the Son river on the north.
- The central part of the plateau acts as a water divide between the Son drainage system in the north and the Mahanadi river system in the south.
- The region is uneven with general elevation varying from 150 m to 1,200 m.
- The Bhanrer and Kaimur are located close to the trough-axis.
- The general horizontality of the strata shows that this area has not undergone any major disturbance.

48. Write a note on Chotanagpur Plateau?

- Chotanagpur plateau represents the north-eastern projection of the Indian Peninsula.
- Mostly in Jharkhand, northern part of Chhatisgarh and Purulia district of West Bengal.
- The Son river flows in the north-west of the plateau and joins the Ganga.
- The average elevation of the plateau is 700 m above sea level.
- This plateau is composed mainly of Gondwana rocks.
- Rivers like the Damodar, the Subarnrekaha, the North Koel, the South Koel and the Barkar have developed extensive drainage basins.
- The Damodar river flows through the middle of this region in a rift valley from west to east. Here are found the Gondwana coal fields which provide bulk of coal in India.

49. What do you know about Meghalaya Plateau?

- The peninsular plateau extends further east beyond the Rajmahal hills to from Meghalaya or the Shillong plateau.
- Garo-Rajmahal Gap separates this plateau from the main block.
- The plateau is formed by Archaean quartzites, shales and schists.
- The plateau slopes down to Brahmaputra valley in the north and the Surma and Meghna valleys in the south.
- Its western boundary more or less coincides with the Bangladesh border.
- The western, central and the eastern parts of the plateau are known as the Garo Hills (900 m), the Khasi-Jaintia Hills (1,500 m) and the Mikir Hills (700 m).
- Shillong (1,961 m) is the highest point of the plateau.

50. Examine Deccan Plateau?

- It covers an area of about five lakh sq km.
- It is triangular in shape and is bounded by the Satpura and the Vindhya in the north-west, the Mahadev and the Maikal in the north, the Western Ghats in the west and the Eastern Ghats in the east.
- Its average elevation is 600 m.
- It rises to 1000 m in the south but dips to 500 m in the north.
- Its general slope is from west to east which is indicated by the flow of its major rivers.
- Rivers have further subdivided this plateau into a number of smaller plateaus.

51. Highlight features of Maharashtra Plateau?

- The Maharashtra Plateau lies in Maharashtra.
- It forms the northern part of the Deccan Plateau.
- Much of the region is underlain by basaltic rocks of lava origin (Most of the Deccan Traps lies in this region).
- The area looks like a rolling plain due to weathering.
- The horizontal lava sheets have led to the formation of typical Deccan Trap topography (step like).
- The broad and shallow valleys of the Godavari, the Bhima and the Krishna are flanked (bordered on the opposite sides) by flat-topped steep sided hills and ridges.
- The entire area is covered by black cotton soil known as regur.

52. Write an account on Aravali Range?

- They are aligned in north-east to south-west direction. They run for about 800 km between Delhi and Palanpur in Gujarat.
- They are one of the oldest (very old) fold mountains of the world and the oldest in India.
- They are relict (remnants after severe weathering and erosion since millions of years) of the world's oldest mountain formed as a result of folding (Archaean Era).
- They continue up to Haridwar buried under the alluvium of Ganga Plains.
- The range is conspicuous in Rajasthan (continuous range south of Ajmer where it rises to 900 m.) but becomes less distinct in Haryana and Delhi (characterized by a chain of detached and discontinuous ridges beyond Ajmer).

53. Elaborate upon the features of Vindhyan Range?

- The Vindhyan Range, overlooking the Narmada valley, rises as an escarpment (a long, steep slope at the edge of a plateau or separating areas of land at different heights) flanking (neighboring on one side) the northern edge of the Narmada-Son Trough (trough is opposite of ridge and it is a narrow depression).

- It runs more or less parallel to the Narmada Valley in an east-west direction from Jobat in Gujarat to Sasaram in Bihar for a distance of over 1,200 km.
- The general elevation of the Vindhyan Range is 300 to 650 m.
- Most parts of the Vindhayan Range are composed of horizontally bedded sedimentary rocks of ancient age. (Rock System)
- The rivers Chambal, Betwa and Ken rise within 30 km of the Narmada.

54. Write a note on Satpura Range?

- Satpura range is a series of seven mountains ('Sat' = seven and 'pura' = mountains)
- It runs in an east-west direction south of the Vindhyas and in between the Narmada and the Tapi, roughly parallel to these rivers.
- It stretches for a distance of about 900 km.
- Parts of the Satpuras have been folded and upheaved. They are regarded as structural uplift or 'horst'.
- Dhupgarh (1,350 m) near Pachmarhi on Mahadev Hills is the highest peak.
- Amarkantak (1,127 m) is another important peak.

55. What do you know about Western Ghats (or the Sahyadris)?

- They form the western edge of the Deccan tableland.
- Run from the Tapi valley (21° N latitude) to a little north of Kanyakumari (11° N latitude) for a distance of 1,600 km.
- The Western Ghats are steep-sided, terraced, flat-topped hills presenting a stepped topography facing the Arabian Sea coast.
- This is due to the horizontally bedded lavas, which on weathering, have given a characteristic 'landing stair aspect' to the relief of this mountain chain.
- The Western Ghats abruptly rise as a sheer wall to an average elevation of 1,000 m from the Western Coastal Plain.
- South of Malabar, the Nilgiris, Anamalai, etc. present quite different landscape due to the difference in geological structure.

56. Throw light on the Physical Features of Eastern Ghats?

- Eastern Ghats run almost parallel to the east coast of India leaving broad plains between their base and the coast.
- It is a chain of highly broken and detached hills starting from the Mahanadi in Odisha to the Vagai in Tamil Nadu. They almost disappear between the Godavari and the Krishna.
- They neither have structural unity nor physiographic continuity. Therefore these hill groups are generally treated as independent units.
- It is only in the northern part, between the Mahanadi and the Godavari that the Eastern Ghats exhibit true mountain character. This part comprises the Maliya and the Madugula Konda ranges.
- The peaks and ridges of the Maliya range have a general elevation of 900-1,200 m and Mahendra Giri (1,501 m) is the tallest peak here.

57. Discuss Significance of the Peninsular Plateau?

- There are huge deposits of iron, manganese. copper, bauxite, chromium, mica, gold, etc.
- 98 per cent of the Gondwana coal deposits of India are found in the Peninsular Plateau.
- Besides there are large reserves of slate, shale, sandstones, marbles, etc.
- A large part of north-west plateau is covered with fertile black lava soil which is extremely useful for growing cotton.
- Some hilly regions in south India are suitable for the cultivation of plantation crops like tea, coffee, rubber, etc..
- Some low lying areas of the plateau are suitable for growing rice.
- The highlands of the plateau are covered with different types of forests which provide a large variety of forest products.
- The rivers originating in the Western Ghats offer great opportunity for developing hydroelectricity and providing irrigation facilities to the agricultural crops.
- The plateau is also known for its hill resorts such as Udagamangalam (Ooty), Panchmarhi, Kodaikanal, Mahabaleshwar, Khandala, Matheron, Mount Abu, etc.

58. Provide an introduction of Himalayan River Systems?

- The Indus, the Ganga and the Brahmaputra comprise the Himalayan river systems.
- The Himalayan Rivers existed even before the formation of Himalayas i.e. before the collision of Indian Plate with the Eurasian plate (Antecedent Drainage).
- They were flowing into the Tethys Sea. These rivers had their source in the now Tibetan region.
- The deep gorges of the Indus, the Satluj, the Brahmaputra etc. clearly indicate that these rivers are older than the Himalayas.

59. Write an account on Indus River?

- India got her name from Indus.' The Indus Valley Civilization' was born around this river.
- It flows in north-west direction from its source (Glaciers of Kailas Range – Kailash range in Tibet near Lake Manasarovar) till the Nanga Parbhat Range.
- It's length is about 2,900 km. Its total drainage area is about 1,165,000 square km (more than half of it lies in semiarid plains of Pakistan). It is joined by Dhar River near Indo-China border.
- After entering J&K it flows between the Ladakh and the Zaskar Ranges. It flows through the regions of Ladakh, Baltistan and Gilgit.
- Average elevation at which the Indus flows through JK is about 4000 m above sea level.
- It is joined by the Zaskar River at Leh

60. Mention some important fact about Jhelum River?

- The Jhelum has its source in a spring at Verinag in the south-eastern part of the Kashmir Valley.
- It flows northwards into Wular Lake (north-western part of Kashmir Valley). From Wular Lake, it changes its course southwards. At Baramulla the river enters a gorge in the hills.
- The river forms steep-sided narrow gorge through Pir Panjal Range below Baramula.
- At Muzaffarabad, the river takes a sharp hairpin bend southward.
- Thereafter, it forms the India-Pakistan boundary for 170 km and emerges at the Potwar Plateau near Mirpur.
- After flowing through the spurs of the Salt Range it debouches (emerge from a confined space into a wide, open area) on the plains near the city of Jhelum.
- It joins the Chenab at Trimmu.
- The river is navigable for about 160 km out of a total length of 724 km.

61. Write short note on Chenab River?

- The Chenab originates from near the Bara Lacha Pass in the Lahul-Spiti part of the Zaskar Range.
- Two small streams on opposite sides of the pass, namely Chandra and Bhaga, form its headwaters at an altitude of 4,900 m.
- The united stream Chandrabhaga flows in the north-west direction through the Pangi valley,parallel to the Pir Panjal range.
- Near Kistwar, it cuts a deep gorge.
- It enters the plain area near Akhnur in Jammu and Kashmir.
- From here it through the plains of Pakistani Punjab to reach Panchnad where it joins the Satluj after receiving the waters of Jhelum and Ravi rivers.

62. Highlight the features of Ravi River?

- The Ravi has its source in Kullu hills near the Rohtang Pass in Himachal Pradesh.
- It drains the area between the Pir Panjal and the Dhaola Dhar ranges.
- After crossing Chamba, it takes a south-westerly turn and cuts a deep gorge in the Dhaola Dhar range.
- It enters Punjab Plains near Madhopur and later enters Pakistan below Amritsar.
- It debouches into the Chenab a little above Rangpurin Pakistani Punjab.

63. Highlight some important fact about Beas River?

- The Beas originates near the Rohtang Pass, at a height of 4,062 m above sea level, on the southern end of the Pir Panjal Range, close to the source of the Ravi.
- It crosses the Dhaola Dhar range and it takes a south-westerly direction and meets the Satluj river at Harike in Punjab.
- It is a comparatively small river which is only 460 km long but lies entirely within the Indian territory.

64. Describe the flow of Satluj River?

- The Satluj rises from the Manasarovar-Rakas Lakes in western Tibet at a height of 4,570 m within 80 km of the source of the Indus.
- Like the Indus, it takes a north-westerly course upto the Shipki La on the Tibet-Himachal Pradesh boundary.
- It cuts deep gorges where it pierces the Great Himalaya and the other Himalayan ranges.
- During its onward journey it receives the collective drainage of the Ravi, Chenab and Jhelum rivers. It joins the Indus a few kilometres above Mithankot.
- Out of its total length of 1,450 km, it flows for 1,050 km in Indian territory.

65. Mention the origin of Ganga River?

- The Ganga originates as Bhagirathi from the Gangotri glacier in Uttar Kashi District of Uttarakhand at an elevation of 7,010 m.
- Alaknanda River joins Bhagirathi at Devaprayag.
- From Devapryag the river is called as Ganga.

66. Write a note on Ganga – Brahmaputra Delta?

- Before entering the Bay of Bengal, the Ganga, along with the Brahmaputra, forms the largest delta of the world between the Bhagirathi/Hugli and the Padma/Meghna covering an area of 58,752 sq km.
- The coastline of delta is a highly indented area.
- The delta is made of a web of distributaries and islands and is covered by dense forests.
- A major part of the delta is a low-lying swamp which is flooded by marine water during high tide.

67. Describe the flow of Yamuna River?

- Largest and the most important tributary.
- It originates from the Yamnotri glacier on the Bandarpunch Peak in the Garhwal region in Uttarakhand at an elevation of about 6,000 meters.
- It cuts across the Nag Tibba, the Mussoorie and the Shiwalik ranges.
- It emerges out of the hilly area and enters in plains.
- Its main affluent in the upper reaches is the Tons which also rises from the Bandarpunch glacier.

68. Write an account on Chambal River?

- The Chambal rises in the highlands of Janapao Hills (700 m) in the Vindhyan Range.
- It flows through the Malwa Plateau.
- It joins the Yamuna in Etawah district of Uttar Pradesh.
- The river flows much below its banks due to severe erosion because of poor rainfall and numerous deep ravines have been formed in the Chambal Valley, giving rise to badland topography (Arid Landforms)
- The total length of the river is 1,050 km.

69. Write a detailed account on Brahmaputra river system?

- The Brahmaputra (meaning the son of Brahma).
- It is 2,900 km in length.
- Source: Chemayung dung glacier (Kailas Range) at an elevation of about 5,150 m. It's source is very close to the sources of Indus and Satluj.
- Mariam La separates the source of the Brahmaputra from the Manasarovar Lake.
- Brahmaputra flows eastwards in Southern Tibet for about 1,800 km.
- In Tibet it passes through the depression formed by the Indus-Tsangpo Structure Zone between the Great Himalayas in the south and the Kailas Range in the north.
- It receives a large number of tributaries in Tibet. The first major tributary is the Raga Tsangpo meeting the Tsangpo near Lhatse Dzong.
- Towards the end of its journey in Tibet, its course abruptly takes a south ward turn around Namcha Barwa (7,756 m)(Syntaxial Bend).
- Here it cuts across the eastern Himalaya through the Dihang or Siang Gorge and emerges from the mountains near Sadiya in the Assam Valley.
- In the north-eastern parts of Assam Valley, it is joined by two important tributaries viz, the Dibang (or Sikang) from the north and Lohit from the south.

70. Examine the flow of Narmada River?

- Narmada is the largest west flowing river of the peninsular India.
- Narmada flows westwards through a rift valley between the Vindhyan Range on the north and the Satpura Range on the south.
- It rises from Maikala range near Amarkantak in Madhya Pradesh, at an elevation of about 1057 m.
- Narmada basin extends over states of Madhya Pradesh, Gujarat, Maharashtra and Chhattisgarh having an area of 1 Lakh Sq.km.
- It is bounded by the Vindhyas on the north, Maikala range on the east, Satpuras on the south and by the Arabian Sea on the west.
- Its total length from its source in Amarkantak to its estuary in the Gulf of Khambhat is 1,310 km.
- The hilly regions are in the upper part of the basin, and lower middle reaches are broad and fertile areas well suited for cultivation.

- Jabalpur is the only important urban centre in the basin.
- The river slopes down near Jabalpur where it cascades (a small waterfall, especially one in a series) 15 m into a gorge to form the Dhuan Dhar (Cloud of Mist) Falls.

71. Highlight the major tributaries of Narmada River?

- Since the river flows through a narrow valley confined by precipitous (dangerously high or steep) hills, it does not have many tributaries.
- The absence of tributaries is especially noted on the right bank of the river where the Hiran is the only exception.
- The other right bank tributaries are the Orsang, the Barna and the Kolar.
- A few left bank tributaries drain the northern slopes of the Satpura Range and join the Narmada at different places.
- The major Hydro Power Project in the basin are Indira Sagar, Sardar Sarovar, Omkareshwar, Bargi and Maheshwar.

72. Write short note on Chilka Lake?

- It is Situated in the state of Odisha, it is a brackish water coastal lake.
- It is the largest coastal lake in India.
- The lake was formed due to the silting action of the Mahanadi River which drains into the northern end of the lake.
- The area of the lake varies from 1175 sq km in the monsoon season to 900 sq km in the dry season.

73. Define Dal Lake in short?

- Dal is famous lake in Srinagar, Stretching over an area of 18 sq km, it is divided by causeways into four basins; namely, Gagribal, Lokut Dal, Bod Dal, and Nagin.
- It is well known for approximately five hundred houseboats. Apart from houseboats, the lake provides a good opportunity to the tourists for canoeing, water-surfing, and kayaking.
- The lake has some interesting flora like lotus flowers and water lilies and water-chestnut.

74. Write short note on Kolleru Lake?

- Situated in Andhra Pradesh, it is the largest fresh water lake of India.
- It is located between the deltas of the Krishna and Godavari rivers in the Krishna and Godavari districts.
- The lake was an important habitat for an estimated 20 million residents and migratory birds Grey or Spot-billed pelicans.
- Rich in flora and fauna, it attracts birds from Siberia and eastern Europe between the months of October and March.

75. Write short note on Loktak Lake?

- It is the largest fresh water lake in north-east India.
- It is also called the only "Floating Islands Lake" in the world due to the floating Phundis (floating islands) on it.
- It was designated a wetland of international importance under Ramsar Convention in 1990.
- It serves as a source of water for hydro-power generation, irrigation, and drinking.

76. Write short note on Pulicat Lake?

- It is the second largest brackish water lake on the Coromandal Coast.
- It lies on the border of Andhra Pradesh and Tamil Nadu.
- The barrier island of Sriharikota separates the lake from the Bay of Bengal. The lake is 60 km long and varies 0.5 to 18 km in width.
- It is the habitat of numerous local and migratory birds.

77. Write short note on Sambhar Lake?

- Situated about 70 km to the west of Jaipur city, it is the largest salt lake of India. On the eastern end, the lake is divided by a 5 km long dam made of stones.
- To the east of the dam are salt evaporation ponds where salt is being produced for more than a thousand years.
- Sambhar has been designated a Ramsar site (recognized wetland) of international importance. Thousands of Siberian birds reach the lake during the winter season.

78. Write short note on Vembanad Lake (Vembanad Kayal or Vembanad Kol) ?

- Covering an area of about 200 sq km, it is the largest lake in Kerala.
- The lake lies at sea level, and is separated from the Arabian Sea by a narrow barrier island.
- Several rivers flow into the lake including the Pamba and Periyar.
- The lake surrounds the islands of Pallipuram and Perubalam.

79. Write short note on Wular Lake?

- Situated in the Valley of Kashmir between Sopore and Bandipore, it is the largest fresh water lake in India.
- The size of the lake varies between 30 and 250 km. The River Jhelum feeds the lake, which acts as a natural reservoir.
- The Tulbul Project is a "navigation lock-cum-control structure" at the mouth of the Wular lake.

80. Write short note on Lonar Lake?

- Lonar Lake is a saline and alkaline lake located in Maharashtra.
- It was created by an asteroid collision with earth impact during the Pleistocene Epoch.
- It is one of the four known, hyper-velocity, impact craters in basaltic rock anywhere on Earth.
- The other three basaltic impact structures are in southern Brazil.
- It is a notified National Geo-heritage Monument, situated inside the Deccan Plateau.

81. What is Glacier?

- Glaciers are a bulk of ice moving under its weight. It forms in areas where the amassing of snow goes beyond its ablation over many years.
- They are generally seen in the snow-fields.
- This largest freshwater basin covers around 10 percent of the land surface of the Earth.
- According to the topography and the location of the glacier, it can be categorized as Mountain Glacier (Alpine Glaciers) or Continental Glacier (Ice Sheets).
- The Continental Glacier moves outward in all directions whereas the Mountain Glacier moves from a higher to a lower altitude.

82. Mention the types of Glaciers?

- **Glaciers can be distinguished in two major categories based on its type:**

Alpine Glaciers	Ice Sheets
• Alpine glaciers are formed on the mountainsides and they usually move downwards through the valleys. • There are times when an alpine glacier also deepens the valleys by pushing away the dirt, soil, and other materials. • These glaciers are found in high mountains.	• Ice sheets form broad domes and usually spread out in all directions. • When the ice sheets spread, they cover all the areas such as valleys, plains, and mountains with a thick blanket of ice. • The continental glaciers are the largest ice sheets and cover most of Antarctica and islands of Greenland.

83. What are Glacial Landforms?

- Glaciers have played a prominent role in the shaping of landscapes in the mid and high latitudes of alpine environments. The major landforms made by glaciers are:
  1. Glacial Erosional Landforms
  2. Glacial Depositional Landforms

Glacial Erosional Landforms	Glacial Depositional Landforms
The major erosional landforms made by glaciers are: • Cirque • Horns and Serrated Ridges • Glacial Valleys/Troughs	The major depositional landforms made by glaciers are: • Esker • Outwash plains • Drumlins

84. Mention some of the Important Glaciers in India?

- Glaciers in India relevant to UPSC can be listed as follows:

Name	State	Mountain Range
Batura Glacier	Jammu & Kashmir	Karakoram Mountain Range
Khurdopin Glacier	Jammu & Kashmir	Karakoram Mountain Range
Hispar Glacier	Jammu & Kashmir	Karakoram Mountain Range
Biafo Glacier	Jammu & Kashmir	Karakoram Mountain Range
Baltoro Glacier	Jammu & Kashmir	Karakoram Mountain Range
Chomolungma glacier	Jammu & Kashmir	Karakoram Mountain Range
Diamir Glacier	Jammu & Kashmir	Karakoram Mountain Range
Siachen Glacier	Jammu & Kashmir	Karakoram Mountain Range
Gangotri Glacier	Uttarkashi, Uttarakhand	Himalayas

Milam Glacier	Uttarakhand	Trishul peak of Pithoragarh
Pindari glacier	Nanda Devi, Uttarakhand	Upper reaches of the Kumaon Himalayas
Zemu Glacier	Sikkim	Eastern Himalaya Located on Kanchenjunga peak

85. Write short note on Gangotri Glacier?

- This is an important glacier in India.
- Largest Glacier in Uttarakhand.
- Source of the Ganges (River Bhagirathi).
- The Gangotri glacier originates at the northern slope of Chaukhamba range of peaks in Garhwal Himalayas.
- Gangotri is not a single valley glacier, but a combination of several other glaciers.

86. What do you understand by Glacial Till?

- The unassorted coarse and fine debris dropped by the melting glaciers is called glacial till.
- Some amount of rock debris small enough to be carried by such melt-water streams is washed down and deposited.
- Such glaciofluvial deposits are called **outwash deposits**.
- The outwash deposits are roughly stratified and assorted.

87. What are Moraines?

- They are **long ridges of deposits of glacial till.**
- **Terminal moraines** are long ridges of debris deposited at the end (toe) of the glaciers.
- Lateral moraines form along the sides parallel to the glacial valleys.
- Many valley glaciers retreating rapidly leave an irregular sheet of till over their valley floors called **ground moraines.**
- The moraine in the centre of the glacial valley flanked by lateral moraines is called **medial moraine.**
- They are imperfectly formed as compared to lateral moraines. Sometimes medial moraines are indistinguishable from ground moraines.

88. Write short on Eskers?

- These are ridges made of sands and gravels, deposited by glacial meltwater flowing through tunnels within and underneath glaciers, or through meltwater channels on top of glaciers.
- Over time, the channel or tunnel gets filled up with sediments. As the ice retreats, the sediments are left behind as a ridge in the landscape.

89. Define Drumlins?

- They are **smooth oval shaped ridge-like features** composed mainly of glacial till with some masses of gravel and sand.
- The long axes of drumlins are parallel to the direction of ice movement.
  - They may measure up to 1 km in length and 30 m or so in height.

- The drumlin end facing the glacier is called the toss end and is blunter and steeper than the other end called tail.

90. Write down the Features of Monsoon Rainfall?

- Monsoon rain is seasonal in character which occurs between June and September.
- Spatial distribution of rainfall is largely governed by relief or topography. For instance the windward side of the Western Ghats registers a rainfall of over 250 cm. Again, the heavy rainfall in the northeastern states can be attributed to their hill ranges and the Eastern Himalayas. Rainfall ranges from 20 cm in western Rajasthan to more than 400 cm in certain parts of Western Ghats and North-East India.
- The monsoon rainfall has a declining trend with increasing distance from the sea. Rainfall decreases from east to west in plains as one branch of monsoon enters from eastern side. Kolkata receives 119 cm, Allahabad 76 cm and Delhi 56 cm only.
- Breaks in rainfall are related to the cyclonic depressions mainly formed at the head of the Bay of Bengal, and their crossing into the mainland. Besides the frequency and intensity of these depressions, the passage followed by them determines the spatial distribution of rainfall.
- The rains sometimes end considerably earlier than usual, causing great damage to standing crops and making the sowing of winter crops difficult.

91. Write down the distribution of Annual Raifall in India?

Category	Rainfall in cms	Regions
Heavy Rainfall	More than 200	Western coast, western ghats, sub-Himalayan region of north-east, Garo, Khasi and Jainta hills of Meghalaya. In some parts, rain exceeds 1000 cm.
Moderate Rainfall	Between 100 to 200	100 cm isohyets extends from Gujarat to south up to Kanyakumari parallel to western ghats. Northern Andhra Pradesh, eastern part of Maharashtra, Madhya Pradesh, Odisha, some parts of Jammu and Kashmir.
Low Rainfall	Between 60 to 100	Most parts of Tamil Nadu, Karnataka, Andhra Pradesh, eastern Rajasthan, South-Western Uttar Pradesh.

Inadequate rainfall	Less than 60	Punjab, Haryana, North-Western Rajasthan, Kachchh, Kathaiawar.

92. Discuss the origin of Indian Monsoons?

- The role of the Himalayas and Tibetan Plateau as a physical barrier and a source of high-level heat.
- The circulation of upper air jet streams in the troposphere.
- The existence of upper air circum-polar whirl over north and south poles in the troposphere.
- The differential heating and cooling of the huge landmass of Asia and the Indian and the Pacific Oceans.
- The occurrence of El-Nino in the South Pacific and Indian Oceans.

93. Discuss Jet Stream and Indian Monsoon?

- Jet stream is the most prominent movement in upper level westerly wind flows; irregular, concentrated, meandering bands of geo-strophic wind, travelling at speeds of 300 to 400 kmph.
- The jet streams are high altitude (900-1200 m) westerly winds between middle latitudes (summer 35^0N-45^0N; winter 20^0N-35^0N) in the Northern Hemisphere)
- The upper air westerly jet streams are extended upto 20^0N-35^0N (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 Himalaya and Tibetan Plateau.

94. Discuss about the El- Nino and the India Monsoon ?

- The Indian monsoon is influenced by El-Nino, Southern Oscillation and the Somalian Ocean Current. El-Nino, meaning "Child Christ", is a warm ocean current appearing along the Peru coast, generally in December.
- It replaces the cold Peru ocean current which flows along the Peru coast in normal years. Under normal conditions, the Peru is a cold water current, while over the western Pacific (Borneo, Indonesia and Eastern Australia) the ocean current is warn is warm and deep.
- The appearance of El-Nino "reverses the condition" there, and develops warm conditions over the eastern Pacific (Peru and Chile coasts) and cool conditions in the western Pacific (Australia, New Guinea, and Indonesia).
- Whenever this warm ocean current (El-Nino) is produced near the Peru coast, the amount of precipitation along the coastal areas of (Peru and Chile) South America is usually high, while the eastern coast of Australia, New Guinea, and Indonesia record drought conditions.

95. Write about the seasons in India?

- The subcontinent of India has great latitudinal dimensions: There are different seasons from Jammu and Kashmir to Kanyakumari (Cape-Camorin).
- Seasons of North-East Monsoon
  1. Winter season, mid-December to mid-March, and
  2. Hot weather season, mid-March to May.
- Seasons of South-West Monsoon
  1. Rainy season, June to September
  2. Season of retreating monsoon, October to mid-December.

96. What do you understand by 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 as:
- The mean monthly temperature.
- The mean monthly rainfall.
- 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)

97. Write a note on the Indian Monsoons?

- The monsoon is a double system of seasonal winds – They flow from sea to land during the summer and from land to sea during winter.
- Monsoons are peculiar to Indian Subcontinent, South East Asia, parts of Central Western Africa etc.
- They are more pronounced in the Indian Subcontinent compared to any other region.
- Indian Monsoons are Convection cells on a very large scale.
- India receives south-west monsoon winds in summer and north-east monsoon winds in winter.
- South-west monsoons are formed due to intense low pressure system formed over the Tibetan plateau.
- North-east monsoons are associated with high pressure cells over Tibetan and Siberian plateaus.
- South-west monsoons bring intense rainfall to most of the regions in India and north-east monsoons bring rainfall to mainly south-eastern coast of India (Southern coast of Seemandhra and the coast of Tamil Nadu.)

98. Highlight the role of ITCZ (Inter-Tropical Convergence Zone) Indian Monsoons?

- The southeast trade winds in the southern hemisphere and the northeast trade winds in the northern hemisphere meet each other near the equator.
- The meeting place of these winds is known as the Inter-Tropical Convergence Zone (ITCZ).
- This is the region of ascending air, maximum clouds and heavy rainfall.
- The location of ITCZ shifts north and south of equator with the change of season.
- In the summer season, the sun shines vertically over the Tropic of Cancer and the ITCZ shifts northwards.
- The southeast trade winds of the southern hemisphere cross the equator and start blowing in southwest to northeast direction under the influence of Coriolis force.
- These displaced trade winds are called south-west monsoons when they blow over the Indian sub-continent.
- The front where the south-west monsoons meet the north-east trade winds is known as the Monsoon Front (ITCZ). Rainfall occurs along this front.

99. Explain how Jet Streams affect Weather?

- Jet streams have distinct peaks (ridges) and troughs.
- Ridges occur where the warm air mass pushes against the cold air mass. Troughs occur where cold air mass drops into warm air.
- The region on earth below the trough is at low pressure and the region below ridge is at high pressure.
- This condition occurs due to weakening of jet stream due to lesser temperature contrast between sub-tropics and temperate region (Our concern is STJ only).
- Usually the trough region (the region exactly below the jet stream trough) creates cyclonic condition (low pressure) at the surface of earth whereas the ridge regions creates anticyclonic condition.
- Troughs create upper level divergence which is associated with convergence at the surface (low pressure – cyclonic conditions) and ridges create upper level convergence which is associated with divergence at the surface (high pressure – cyclonic conditions).
- These ridges and troughs give rise to jet streaks which are also responsible for cyclonic and anticyclonic weather conditions at the surface.

100. Write a note on Retreating Monsoon Season – North East Monsoon Season?

- Starts with the beginning of the withdrawal of southwest monsoon (middle of September – November) and lasts till early January.
- The monsoons withdraw from the extreme north-west end of the country in September, from the peninsula by October and from the extreme south-eastern tip by December.
- In Punjab the south-west monsoons reach in the first week of July and withdraw from there in the second week of September.
- The south-west monsoons reach Coromandel coast in the first week of June and withdraw from there only in the middle of December.

101. Discuss what type of Climate Does India have?

- India's climate closely resembles the climate that of a tropical country although its northern part (north of tropic of cancer) is situated in the temperate belt.
- Indian subcontinent is separated from the rest of Asia by the lofty Himalayan ranges which block the cold air masses moving southwards from Central Asia.
- As a result, during winters, the northern half of India is warmer by 3°C to 8°C than other areas located on same latitudes.
- During summer, due to over the head position of the sun, the climate in the southern parts resemble equatorial dry climate.
- The north Indian plains are under the influence of hot dry wind called 'loo' blowing from the Thar, Baloch and Iranian Deserts, increasing the temperatures to a level comparable to that of the southern parts of the country.
- Thus the whole of India, south of the Himalayas can be climatically treated as a tropical country.
- The seasonal reversal of winds in Arabian Sea and Bay of Bengal give India a typical tropical monsoon climate.
- So Indian climate, to be precise, is tropical monsoon type (a distinct wet and dry climate) rather than just a tropical or half temperate climate.

102. Mention the factors influencing Indian Climate?

- Latitudinal location
- Distance from the Sea
- The Himalayas
- Physiography
- Monsoon Winds
- Upper Air Circulation
- El Nino and La Nina
- Tropical Cyclones and Western Disturbances

103. Discuss the origin of Tropical Cyclones and Western Disturbances?

- Tropical cyclones originate in the Bay of Bengal and Arabian Sea and they influence large parts of the peninsular India.
- Majority of the cyclones originate in the Bay of Bengal and influence the weather conditions during the south-west monsoon season (low intensity cyclones).
- Some cyclones are born during the retreating monsoon season, i.e., in October and November (high intensity cyclones) and influence the weather conditions along the eastern coast of India.
- The western disturbances originate over the Mediterranean Sea and travel eastward under the influence of westerly jet stream.

104. Explain what is El Nino, and how does it affect Indian Monsoon?

- The El Nino is a subsurface (flowing under the surface) warm ocean current which flows from north to south along the Peruvian coast. The El Nino was first of all studied by an American Gilbert Walker.
- According to him, the warm water of the El Nino increases the temperature of the southern equatorial warm oceanic current. Since this oceanic current flows from east to west, water in the whole middle Pacific Ocean becomes warm and this causes very low atmospheric pressure in that area. Whenever this low pressure belt extends to the eastern central part of the Indian ocean, it changes the direction of the India monsoon.
- The low pressure formed on the landmass of the Indian sub-continent is comparatively weaker to this low pressure. Therefore, winds from the high pressure area of the Arabian Sea begin to blow towards the south-eastern Indian Ocean. This causes drought in the Indian sub-continent.
- Inversely, when the effect of the El Nino water current is limited to the middle Pacific, the southwest monsoon winds do not get disturbed and there is enough rainfall in India.
- The El Nino effect is unable to provide a complete interpretation of drought in India. Therefore, more research is needed in this direction.

105. Write short on ENSO?

- Southern Oscillation is simply the oscillation or alternating positions of low pressure and high pressure cells over eastern and western Pacific.
- Southern Oscillation coinciding with El Nino is called ENSO or El Nino Southern Oscillation. (SO usually coincides with EL Nino. This why El Nino is usually referred to as ENSO)
- ENSO = (warm water in eastern Pacific + low pressure over eastern Pacific) + (cool water in western Pacific + high pressure in western Pacific)
- Climatic conditions same as El Nino.

106. Discuss the major factors which affects the Natural Vegetation of India?

- Climate, soil and topography are the major factors that influence Natural Vegetation of a place.
- The main climatic factors are rainfall and temperature. The amount of annual rainfall has a great bearing on the type of vegetation.

- Temperature is the major factor in Himalayas and other hilly regions with an elevation of more than 900 metres.
- As the temperature falls with altitude in the Himalayan region the vegetal cover changes with altitude from tropical to sub-tropical, temperate and finally alpine.
- Soil is an equally determining factor in few regions. Mangrove forests, swamp forests are some of the examples where soil is the major factor.
- Topography is responsible for certain minor types e.g. alpine flora, tidal forests, etc.

107. Write short on Tropical evergreen rain forests?

- The Tropical Evergreen rain forests are found in the areas where precipitation is more than 200 cm. They are largely found in the Northeastern regions of Arunachal Pradesh, Meghalaya, Assam, Nagaland, the Western Ghats, the Tarai areas of the Himalayas and the Andaman groups of Islands.
- They are also found in the hills of Khasi and Jaintia. The trees in this area have intense growth. The major trees found in this area are Sandal Wood, Rosewood, Garjan, Mahogany, and bamboo.
- It has copious vegetation of all kinds – trees, shrubs, and creepers giving it a multilayered structure. The elephants, monkey, lemur are the common animals found in these areas.

108. Explain Deciduous or Monsoon type of forests?

- The Deciduous forests are found on the lower slope of the Himalayas, West Bengal, Chhattisgarh, Bihar, Orissa, Karnataka, Maharashtra Jharkhand and the adjoining areas. The precipitation in this area is between 100 cm and 200 cm.
- The Teak is the dominant species seen in the area. Along with that Deodar, Blue Gum, Pal Ash, Sal, Sandalwood, Ebony, Arjun, Khair, and Bamboo are also seen.
- The trees in this forest shed their leaves during dry winter and dry summer. On the basis of the availability of water, these forests are again divided into moist and dry deciduous.

109. Write short note on Dry deciduous forests?

- These forests grow in areas where the precipitation is between 50 cm and 100 cm.
- These are mainly seen in the areas of the Central Deccan plateau, Punjab, Haryana, parts of Uttar Pradesh, Madhya Pradesh and South-east of Rajasthan.

110. What are Mountain forests?

- Mountain forests differ significantly along the slopes of the mountain. On the foothills of the Himalayas until a height of 1500 meters, evergreen trees like Sal, teak, and bamboo grow copiously.
- On the higher slope, temperate conifer trees like pine, fir, and oak grow. At the higher elevation of the Himalayas, rhododendrons and junipers are found. Further, than these vegetation zones, alpine grasslands appear up to the snowfield.

111. Write about Tidal or Mangrove forests?

- The tidal or mangrove forests grow by the side of the coast and on the edges of the deltas e.g., the deltas of the Cauvery, Krishna, Mahanadi, Godavari, and Ganga. In West Bengal, these forests are known as 'Sundarbans'.
- The 'sundari' is a most major tree in these forests. The important trees of the tidal forests are hogla, garan, pasur etc. This forest is an important factor in the timber industry as they provide timber and firewood. Palm and coconut trees beautify the coastal strip.

112. Write note on Semi-deserts and Deserts vegetations?

- This area receives a rainfall less than 50 cm. Thorny bushes, acacia, and Babul are found in this vegetation region. The Indian wild date is generally found here.
- They have long roots and thick flesh. The plants found in this region store water in their stem to endure during the drought. These vegetations are found in parts of Gujarat's, Punjab and in Rajasthan.

113. Write the regional distribution of Vindhyan System of rocks in India?

- This mountain forms a dividing line between the Ganga Plain and the Deccan Plateau.
- It covers an extensive area of 103,600 sq km from Chittorgarh in Rajasthan to Sasaram in Biha
- The Great Boundary Fault (GBF) separates the Vindhyan system from the Aravallis.
- It is well known for red-sandstone, building material, diamondiferous etc.
- **It has been divided in;**

(a) **Bhander Series:** Western Parts of Vindhyan formation.
(b) **Bijwar Series:** Structures over districts of Chhatarpur and Panna in M.P
(c) **Kaimur Series:** Structure over Bundelkhand (UP) and Baghelkhand (MP)

114. Write note on Cuddapah and Vindhyan rocks?

- They are ancient sedimentary rocks (4000 m thick).
- On weathering they give calcareous (containing calcium carbonate; chalky) and argillaceous (consisting of or containing clay) soils.
- The soil is mostly devoid of metalliferous minerals.

115. Define Gondwana rocks?

- These rocks are also sedimentary in nature and they are much younger.
- On weathering they give rise to comparatively less mature soils.
- The soil is more or less of uniform character but of low fertility.

116. Grey and Brown Soil?

- These soils are found in Rajasthan and Gujarat.
- It is formed by the weathering of granite, quartzite and gneiss.
- These loose, friable soils contain iron- oxide (haematite and limonite)

117. Submontane Soil?

- These are formed by the deposition of eroded material from Shiwaliks and the lesser Himalayas.
- These are found in the Tarai region of the submontane stretching from Jammu and Kashmir to Assam.
- The soil supports a luxuriant growth of forest and more prone to soil erosion.

118. Snowfields?

- This soil was found under the snow and glaciers at the highest peak of greater Himalayas, Karakoram, Ladakh, and Zaskar.
- This soil is immature and unsuitable for crops.

119. Karewa Soil?

- Karewa soils are the lacustrine deposits in the Kashmir valleys and Bhadarwah valley.
- The fine silt, clay, and boulder gravels are the composition of Karewa soil. They are characterized with the fossils.
- These soils are mainly devoted to the cultivation of saffron, almonds, apple, walnut, etc.

120. Definition of Soil?

- Soil can be simply defined as a mixture of small rock particles/debris and organic materials/ humus which develop on the earth surface and support growth of plants.

121. Major classification of Indian soils?

1. Alluvial soil [43%]
2. Red soil [18.5%]
3. Black / regur soil [15%]
4. Arid / desert soil
5. Laterite soil
6. Saline soil
7. Peaty / marshy soil
8. Forest soil
9. Sub-mountain soil
10. Snowfields

122. Alluvial soil?

- Mostly available soil in India (about 43%) which covers an area of 143 sq.km.
- Widespread in northern plains and river valleys.
- In peninsular-India, they are mostly found in deltas and estuaries.
- Humus, lime and organic matters are present.
- Highly fertile.
- Indus-Ganga-Brahmaputhra plain, Narmada-Tapi plain etc are examples.
- They are depositional soil – transported and deposited by rivers, streams etc.
- Sand content decreases from west to east of the country.
- New alluvium is termed as **Khadar** and old alluvium is termed as **Bhangar**.
- **Colour:** Light Grey to Ash Grey.
- **Texture:** Sandy to silty loam or clay.
- Rich in: potash
- Poor in: phosphorous.
- Wheat, rice, maize, sugarcane, pulses, oilseed etc are cultivated mainly.

123. Red soil?

- Seen mainly in low rainfall area.
- Also known as **Omnibus group.**
- Porous, friable structure.
- Absence of lime, kankar (impure calcium carbonate).
- **Deficient in**: lime, phosphate, manganese, nitrogen, humus and potash.
- **Colour:** Red because of Ferric oxide. The lower layer is reddish yellow or yellow.
- **Texture:** Sandy to clay and loamy.
- Wheat, cotton, pulses, tobacco, oilseeds, potato etc are cultivated.

124. Black soil / Regur soil?

- Regur means **cotton –** best soil for cotton cultivation.
- Most of the Deccan is occupied by Black soil.
- Mature soil.
- High water retaining capacity.
- Swells and will become sticky when wet and shrink when dried.
- **Self-ploughing** is a characteristic of the black soil as it develops wide cracks when dried.
- **Rich in:** Iron, lime, calcium, potassium, aluminum and magnesium.
- **Deficient in:** Nitrogen, Phosphorous and organic matter.
- **Colour:** Deep black to light black.
- **Texture:** Clayey.

125. Laterite soil?

- Name from Latin word 'Later' which means Brick.
- Become so soft when wet and so hard when dried.
- In the areas of high temperature and high rainfall.
- Formed as a result of high leaching.
- Lime and silica will be leached away from the soil.
- Organic matters of the soil will be removed fast by the bacteria as it is high temperature and humus will be taken quickly by the trees and other plants. Thus, humus content is low.
- **Rich in**: Iron and Aluminum
- **Deficient in**: Nitrogen, Potash, Potassium, Lime, Humus
- **Colour**: Red colour due to iron oxide.
- Rice, Ragi, Sugarcane and Cashew nuts are cultivated mainly.

126. Desert / Arid soil?

- Seen under Arid and Semi-Arid conditions.
- Deposited mainly by wind activities.
- High salt content.
- Lack of moisture and Humus.
- Kankar or Impure Calcium carbonate content is high which restricts the infiltration of water.
- Nitrogen is insufficient and Phosphate is normal.
- **Texture:** Sandy
- **Colour:** Red to Brown.

127. Peaty / Marshy soil?

- Areas of heavy rainfall and high humidity.
- Growth of vegetation is very less.
- A large quantity of dead organic matter/humus which makes the soil alkaline.
- Heavy soil with black colour.

128. Forest soil?

- Regions of high rainfall.
- Humus content is less and thus the soil is acidic.

129. Mountain soil?

- In the mountain regions of the country.
- Immature soil with low humus and acidic.

130. Metallic Minerals?

- Metallic minerals are the sources of metals and provide a strong base for the development of metallurgical industry.
- Iron ore, bauxite etc. produces metal and are included in this category. Metallic minerals exhibit a metallic shine or lustre in their appearance.
- Metallic minerals can be further divided into ferrous and non-ferrous metallic minerals.

131. Ferrous Minerals?

- All those minerals which have iron content are called ferrous minerals. Iron ore, manganese and chromites are examples of ferrous minerals.
- Ferrous Minerals account for about three-fourth of the total value of the production of metallic minerals. These minerals provide a strong base for the development of metallurgical industries, particularly iron, steel and alloys.
- India is well-placed in respect of ferrous minerals both in reserves and production.

132. Non-ferrous Mineral?

- Minerals which do not contain iron are known as non ferrous mineral. Copper, bauxite, etc are non ferrous minerals.
- India is poorly endowed with non-ferrous metallic minerals, except bauxite

133. Non-metallic Minerals?

- Non-metallic minerals are either organic or inorganic in origin and do not contain extractable metals in their chemical composition.
  Based on their origin, they are further classified into two categories, i.e., mineral fuel and other non metallic minerals.
- India is endowed with a large number of non-metallic minerals, but only a few of these are commercially important. They are limestone, dolomite, mica, kyanite, sillimanite, gypsum and phosphate. These minerals are used in a variety of industries such as cement, fertilizers, refractories and electrical goods.
- **Mineral Fuels:** Mineral fuels are organic in origin and derived from the buried animal and plant life such as coal and petroleum. They are also known as fossil fuels.
- **Other Non-metallic Minerals**: Other non-metallic minerals are inorganic in origin such as mica, limestone and graphite, etc.

134. Characteristics of Minerals?

- Basic characteristics of a mineral are following:
- Definite crystalline structure
- Definite chemical composition
- Naturally occurring
- Formed by inorganic processes
- Solid
- For a rock to be mineral it has to have at least three of these characteristics. Other characteristics of minerals are:
- These are unevenly distributed over space.
- There is an inverse relationship in quality and quantity of minerals i.e. good quality minerals are less in quantity as compared to low quality minerals.
- All minerals are exhaustible over time.
- Minerals take a long time to develop geologically and they cannot be replenished immediately at the time of need.

135. Distribution of Minerals in India?

- The distribution of mineral resources in India is uneven. The occurrences of mineral resources are associated with certain types of geological structure.
- Gondwana system is the repository of majority of Coal deposits.
- Dharwar and Cuddapah systems contain resources of major metallic minerals like copper, lead, zinc etc.

136. North Eastern Plateau Region?

- It covers the Chhotanagpur plateau, Orissa plateau and the eastern Andhra plateau.
- This belt contains rich deposits of a variety of minerals, specially used for metallurgical industries such as iron ore, manganese, mica, bauxite, limestone, dolomite etc.
- This region has also rich deposits, coal, along the river valleys of Damodar, Mahanadi, and Son etc.
- This region has also a substantial amount deposit of copper, uranium, thorium, phosphate etc.

137. South-Western Plateau Region?

- This region extends over the Karnataka plateau and adjoining Tamil Nadu plateau and is rich in metallic minerals, particularly in iron ore, manganese and bauxite and in some non-metallic minerals.
- All the three gold mines of India are found in this region. However, coal is not found in this plateau region except Neyveli lignite.
- Kerala has deposits of monazite and thorium, bauxite clay. Goa has iron ore deposits.

138. North-Western Region?

- This belt extends from the gulf of Khambhat in Gujarat to the Aravalli range in Rajasthan.
- Copper, zinc has been major minerals in this belt.
- Rajasthan is rich in building stones, i.e. sandstone, granite, marble. Gypsum and Fuller's earth deposits are also extensive. Dolomite and limestone found in this belt provide raw materials for cement industry.
- Petroleum and natural gas are principal resources of this belt and other minerals are small and scattered.

139. Mention the Important areas of Production of Manganese in India?

- India ranks third in the production of manganese ore in the world, next only to Russia and South Africa. Although Manganese deposits are found in almost all geological formations, but it is mainly associated with Dharwar system.
- The important areas of production are in Odisha, Madhya Pradesh, Maharashtra, Karnataka and Andhra Pradesh. Over 78% of total reserves of manganese ore of India occur in a belt stretching from Nagpur and

Bhandara districts of Maharashtra to Balaghat and Chindwara district of Madhya Pradesh.

- Odisha is the leading producer of Manganese and accounts for 37% of the total production of the country. The important mining areas are Sundargarh, Rayagada, Bolangir, Keonjhar, Jajpur, Mayurbhanj, Koraput, Kalahandi and Bolangir.

140. Mention the Important areas of Production of Bauxite in India?

- Bauxite is a non-ferrous metallic mineral which is used in manufacturing of aluminium. Bauxite is found mainly in tertiary deposits and is associated with laterite rocks.
- Bauxite is found extensively either on the plateau or hill ranges of peninsular India and also in the coastal tracts of the country. India's reserves of bauxite are sufficient to keep the country self-reliant.
- Major reserves occur in Jharkhand, Maharashtra, Madhya Pradesh, Chhatisgarh, Gujarat, Karnataka, Tamil Nadu, Goa and Uttar Pradesh. Huge deposits of bauxite have been discovered in the Eastern Ghats in Odisha and Andhra Pradesh, Salem, Nilgiri and Madurai district of Tamil Nadu, and Banda district of Uttar Pradesh also have workable deposits of bauxite.
- Odisha is the largest producer of Bauxite in India.

141. Mention the Important areas of Production of Copper in India?

- Copper is an important metal in the electrical industry for making wires, electric motors, transformers and generators. India is a poor country with regard to reserves and production of copper.
- Major copper ore deposits are located in Singhbhum district (Jharkhand), Balaghat district (Madhya Pradesh) and Jhunjhunu and Alwar districts (Rajasthan).
- There are small deposits in Gujarat, Karnataka, Andhra Pradesh, Uttar Pradesh, Sikkim, Meghalaya, Maharashtra and West Bengal also.

142. Mention the Important areas of Production of Mica in India?

- Mica is mainly used in electronic and electrical industries.
- It can be split into very thin sheets which are tough and flexible. India is the leading producer in sheet mica.
- Mica is widely distributed in India, but workable deposits occur in only three principle belts, i.e. states of Andhra Pradesh, Jharkhand, Bihar and Rajasthan.
- Bihar and Jharkhand are endowed with high-quality ruby mica. Mica deposit in Bihar is found in Gaya district, Munger district and Bhagalpur district.
- In Jharkhand the main mica belt is in Dhanbad, Palamau, Hazaribagh, Ranchi and Singhbhum districts.

143. What is population census?

- **Population Census** is the total process of **collecting, compiling, analyzing** and **disseminating demographic, economic and social data** pertaining, at a specific time, of all persons in a country or a well-defined part of a country.
- It also **provides the trends in population** characteristics.
- The **Indian Census is one of the largest administrative exercises** undertaken in the world.

144. What are the recent trends in the Growth of Population?

- The percentage decadal growth rates of the six most populous States, namely, Uttar Pradesh, Maharashtra, Bihar, West Bengal, Andhra Pradesh and Madhya Pradesh have fallen during 2001-2011 compared to 1991-2001.
- The fall in the rate of growth is the lowest for Andhra Pradesh and highest for Maharashtra. Tamil Nadu and Puducherry have registered some increase during 2001-2011 over the previous decade.
- Nagaland is the only state in the country where the population has decreased during 2001-2011. For the first time since 1921, urban India added more numbers to its population in a decade than rural India did.

145. Explain Implications of Population Growth?

- India is not growing uniformly. The latest National Family Health Survey (NFHS) indicates that the Total Fertility Rate (TFR) varies significantly across various wealth quintiles:
- The poorest wealth quintile has a TFR of 3.2 children per woman.
- The second lowest wealth quintile has a TFR of 2.5 children per woman.
- The richest wealth quintile has a TFR of 1.5 children per woman.
- This shows that population growth is more concentrated in economically weaker sections of society.

146. Effects of Over Population in India?

- **Unemployment:** Generating employment for a huge population in a country like India is very difficult. The number of illiterate persons increases every year. Unemployment rate is thus showing an increasing trend.
- **Manpower utilisation:** The number of jobless people is on the rise in India due to economic depression and slow business development and expansion activities.
- **Pressure on infrastructure:** Development of infrastructural facilities is unfortunately not keeping pace with the growth of population. The result is lack of transportation, communication, housing, education, healthcare etc. There has been an increase in the number of slums, overcrowded houses, traffic congestion etc.

- **Resource utilisation:** Land areas, water resources, forests are over exploited. There is also scarcity of resources.
- **Decreased production and increased costs:** Food production and distribution have not been able to catch up with the increasing population and hence the costs of production have increased. Inflation is the major consequence of over population.
- **Inequitable income distribution:** In the face of an increasing population, an unequal distribution of income and inequalities within the country widen.

147. Mention Top Five and Bottom Five States/UTS by Decadal Population Growth?

Top Five States/UTs		Bottom Five States/UTs	
States/UT	**Growth Rate**	**State/UT**	**Growth Rate**
Meghalaya	27.82	Nagaland	-0.47
Arunachal Pradesh	25.92	Kerala	4.86
Bihar	25.07	Lakshdweep	6.23
Jammu & Kashmir	23.71	Andman & Nickobar Islands	6.68
Mizoram	22.78	Goa	8.17

148. Mention the Rural-Urban Composition of Indian Population?

- About 68.8% of the total population of India lives in village (2011).
- States like Bihar and Sikkim have a very high percentage of rural population.
- The states of Goa and Maharashtra have only a little over half of their total population residing in villages.
- The Union Territories have a smaller proportion of rural population, except Dadra and Nagar Haveli (53.38%).
- The proportion of urban population in India is 31.16%, but it is showing a much faster rate of growth over the decades due to the development of urban areas in terms of socio-economic conditions and an increased rate of rural-urban migration.

149. Write down the Significance of Census?

- **Source of Information:** The Indian Census is the **largest single source of a variety of statistical information** on different **characteristics of the people of India.**
- Researchers and Demographers use census data to **analyze growth and trends of population and make projections.**
- **Good Governance:** The data collected through the census is **used for administration, planning and policy making** as well as **management and evaluation of various programmes** by the Government.

- **Demarcation:** Census data is also used for **demarcation of constituencies** and **allocation of representation to Parliament,** State legislative assemblies and the local bodies.
- **Giving Grants:** Finance Commission **provides grants to the states on the basis of population figures** available from the Census data.

150. Write note on Fifteenth Census (2011) and Sixteenth Census (2021)?

- In the 2011 Census, **significant fall in case of EAG States** (Empowered action group states: **UP, Uttarakhand, Bihar, Jharkhand, MP, Chhattisgarh, Rajasthan & Orissa) was noticed for the first time.**
- **Sixteenth Census (2021)**

1. **Census 2021** was **postponed** owing to the outbreak of **Covid-19** pandemic.
2. However, it will be the **first digital Census,** also with a provision for **self-enumeration.**
3. It is for the first time that information of households headed by a person from the **Transgender Community** and members living in the family will be collected.

151. What do you understand by Socio-Economic and Caste Census (SECC)?

- The **Socio-Economic and Caste Census (SECC)** was **conducted in 2011 for the first time** since 1931.
- **Economic status,** to allow Central/State authorities to come up with a range of indicators of deprivation which could be used by each authority to define a poor or deprived person.
- **Specific caste name,** to allow the government to re-evaluate which caste groups are economically worse off and which are better off.

152. What is the difference between Census and SECC also right down its significance?

- **Field of Coverage:** The Census provides a portrait of the Indian population while the **SECC is a tool to identify beneficiaries of state support.**
- **Confidentiality of Data:** The Census data is considered confidential, whereas the **data of SECC is open for use by Government departments** to grant and/or restrict benefits to the people.

153. Write down the Significance of SECC?

- **Better Mapping of Inequalities:** SECC has the potential to allow for a mapping of inequalities at a broader level.

1. It will be useful to establish statistical justification for **preserving caste-based affirmative action programmes** or welfare schemes.
2. **Legally Imperative:** It is also legally imperative as the courts require a 'quantifiable data' to **support the existing levels of reservation.**
3. **Constitutional Mandate:** The Constitution of India also favours conducting a caste census.
   Article 340 mandates the appointment of a commission to investigate the conditions of **socially and educationally backward classes** and make recommendations as to the steps that should be taken by governments.

154. Write in brief about the population census of India as per 2011?

- **Total population** : 1,21,05,69,573
- **Male Population** : 62,31,21,843
- **Female Population** : 58,74,47,730
- **Decennial Growth Rate** : 17.7%
- **Population Density** : 382
- **Sex Ratio** : 943
- **Literacy Rate** : 73.03%

155. Mention the State which have Maximum and least Population Density.

S.No.	Maximum	Least
1.	Bihar	Arunachal Pradesh
2.	West Bengal	Mizoram
3.	Kerala	Sikkim
4.	Uttar Pradesh	Manipur
5.	Harayana	Nagaland

156. Mention the State which have Maximum and least Sex Ratio?

S.No.	Maximum	Least
1.	Kerala	Harayana
2.	Tamilnadu	Jammu Kashmir
3.	Andhra Pradesh	Sikkim
4.	Manipur	Punjab
5.	Chhattisgarh	Uttar Pradesh

157. Mention the State which have Maximum and least Literacy Rate?

S.No.	Maximum	Least
1.	Kerala	Bihar
2.	Mizoram	Arunachal Pradesh
3.	Goa	Rajasthan
4.	Tripura	Jharkhand
5.	Himachal Pradesh	Andhra Pradesh

158. What do you understand by food processing?

- Food processing is the transformation of raw ingredients into food or of food into other forms (i.e. food processing may denote direct manufacturing of food or value addition on existing food**).**
- Food processing typically takes harvested crops or butchered animal products and uses these to produce long shelf-life food products.

159. Economic Linkage Effects of Food Processing Industry?

- Linkages is a phenomenon which measures the capability of an industry to generate demand for the products of the other industries.
- Form the point of view of development strategy, linkages are one of the essential feature of an industry. Linkages are of three types: Forward, Backward and sideways.

160. Forward Linkage?

- It is when, the establishment of a processing industry can lead to the development and establishment of the number of advanced stage industries.
- Example, Forest Industry, when established as a base industry, results in establishment of vast number of advanced processing industries like: manufacturing of paper, paper bags, stationary, boxes made of paper, cartons, wooden boxes etc.
- There are many other examples: products such as vegetable oils and rubber are used in a wide variety of manufacturing industries; based on the preparation of hides and skins, tanning operations can be started, as can the manufacture of footwear and other leather goods.

161. Backward Linkage?

- The feedback effects generated by a base industry on the development of the base sector is called backward linkage. The development of the food processing industry has many feed back effects on the agriculture sector itself.
- For Example, once a food processing industry is established, it results in increasing the demand of raw materials provided by the agriculture sector. The establishment of processing facilities is itself an essential first step towards stimulating both consumer demand for the processed product and an adequate supply of the raw material.
- The provision of transport, power and other infra-structural facilities required for agro-industries also benefits agricultural production. The development of these and other industries provides a more favourable atmosphere for technical progress and the acceptance of new ideas in farming itself.

162. Sideways Linkage?

- Sideways linkages are mostly derived from the use of by products and waste products of the main base industrial activity.
- For example: many food processing industries using agriculture raw materials produce waste that can be used further in production of fuel, bio-fuels, paper pulp and fertilizer.
- The production of sugar results in production of molasses as a waste product, which is used by the Alcohol Brewing industry in the production of ethanol.

163. Discuss the processes involved in a food processing industry and use of products?

- **There are two types of processes in the food processing industry:**
  1. **Manufacturing:** Raw materials → Food.
  2. **Value Addition:** Increase shelf life and value of manufactured food.
- Products are divided into two parts in food processing industry:
  1. Primary (E.g: Fruits and Vegetables).
  2. Secondary or Value Added (Jams and Squashes)

164. Why food processing industries are significant?

- India is a land famous for food production. More than 50% of Indian population works in Agriculture related activities. If there are good food processing industries in India, raw materials like grains or meat can be converted into food for domestic and foreign consumption.
- Food processing units acts as a link between agriculture and industries.
- Food processing industries can absorb a major share of workers from the agriculture sector, who face disguised unemployment. It can lead to better productivity and GDP growth.
- Food processing prevents food wastage and helps in attaining food security.
- Processed food requires less space for storage.
- Processed food can be exported. This may help us in getting foreign exchange reserves.

165. What is the scope of food processing industry in India?

- **India's position as a major food producer:** India ranks 1st in the production of - milk, ginger, banana, guava, papaya, mango etc. It ranks 2nd in the production of rice, wheat, potato, sugarcane, cashew nut, tea etc. It is among the top 5 countries in the production of coffee, tobacco, spices, seeds etc. With such a huge raw material base, we can easily become the leading supplier of food items in the world.
- **Resource advantage of India:** Different soil types and different climate types for the cultivation of diverse food crops, long coastal line suitable for fishing, a huge resource of domestic animals etc.
- **Increasing employment:** Expected to create more than 10 lakh new jobs.
- **Curbing Migration:** Provides employment in rural areas, hence reduces migration from rural to urban. Resolves issues of urbanization.
- **Curbing food inflation:** Removes issues of wastage or middle man. Curbs food inflation. Indirect relief on non-food inflation too.
- **Crop Diversification:** Because of long shelf life, farmers can diversify their products.
- **The future driver of Indian growth:** Food processing corresponds to around 10% of GDP in the agriculture-manufacturing sector.

166. Significance of food processing industry in India?

- **Employment Generation:** It provides direct and indirect employment opportunities, because it acts as a bridge between Agriculture and Manufacturing.
- **Doubling of farmers' income:** With the rise in demand for agri-products there will be commensurate rise in the price paid to the farmer, thereby increasing the income.
- **Reduce malnutrition:** Processed foods when fortified with vitamins and minerals can reduce the nutritional gap in the population.
- **Boosts Trade and Earns Foreign exchange:** It is an important source of foreign exchange. For e.g. Indian Basmati rice is in great demand in Middle Eastern countries.
- **Curbing Migration:** Food Processing being a labour intensive industry will provide localized employment opportunities and thus will reduce the push factor in source regions of migration.
- **Curbing Food Inflation:** Processing increases the shelf life of the food thus keeping supplies in tune with the demand thereby controlling food-inflation. **For e.g. Frozen Safal peas are available throughout the year.**
- **Crop-diversification:** Food processing will require different types of inputs thus creating an incentive for the farmer to grow and diversify crops.

167. Write down the important locations of food processing industries in India?

- India has more than 35000 registered units. But majorities of the food processing factories are concentrated in the coastal states (one reason being, accessibility to marine food processing).
- Major coastal states include Andhra, Maharashtra, Karnataka, Kerala, Gujarat, Punjab and West Bengal.
- Non-coastal states include UP, Punjab etc.

168. What are the major segments of food processing industries?

- Fruits and Vegetables, Milk and Milk Products.
- Meat and Poultry, Marine Products.
- Grain Processing, Consumer Food.
- Breakfast cereals, malt protein, weaning, extruded food products.
- Aerated waters/soft drinks, Beer/alcoholic beverages.

169. What are upstream requirements of food processing industries?

- **Upstream stage:** The upstream stage of the production process involves **searching for and extracting raw materials**. They are:
- **Upstream requirements:**
  1. Accessibility to raw materials.
  2. Modern extraction techniques.
  3. Good linkages with farmers.
  4. Storage facilities for raw materials like Grains, Meat, Fish etc.
  5. Quality testing facilities.
  6. Transport facilities.
  7. Workforce.

170. What are downstream requirements of food processing industries?

- **Downstream stage:** The downstream stage in the production process involves **processing the materials collected** during the upstream stage into a finished product.
- **Downstream requirements:**
  1. Latest processing techniques.
  2. Latest processing machinery.
  3. Quality testing facilities.
  4. Organized retail stores for faster distribution.
  5. Workforce.

171. What do you understand by Supply Chain Management?

- Supply chain management (SCM) is the management of the flow of goods. It includes the movement and storage of raw materials, inventory and finished goods from point of origin to point of consumption.
- In Supply Chain Management raw materials like grains, raw meat, fish etc. are collected by different sources. These sources may do preliminary processing of these to make components of a food product before passing over them to the main manufacturer. The manufacturer does the final processing of these components to make the food product.
- The manufacturer hands over the food product to a wholesale. The wholesaler passes the product to a retailer from where the consumer buys the processed food item for his personal use.
- Thus, Supply Chain Management is the management of the upstream and downstream value-added flow of materials from suppliers→ company (manufacturer)→ wholesaler → retailer→ final consumers.

172. What is the importance of Supply Chain Management in Food Processing Industry?

- A good Supply Chain Management practices in a country, helps in boosting the economy as a whole.
- Good supply chain links help farmers, manufactures, wholesalers, retailers and consumers.
- Everyone in the supply chain link will get inputs at a faster rate, at the right time and at a cheaper cost.
- Youth population, middle class, rising income, nuclear families, media penetration etc cited as positive factors.

173. Obstacles in the growth of food processing Industries?

- **Small size companies:** Indian food processing companies are small and can't compete with global giants which invest heavily on R & D.
- **Lack of good laboratories in India:** India lacks good laboratories to check heavy metal and other toxic contamination in food.
- Lack of skilled workforce.
- Lack of right vision and support from the government at the right time.
- Lack of good transportation facilities.
- Lack of storage facilities and good production techniques.
- Lack of organised retail.

174. Government Initiatives for Development of Food Processing Industry in India?

- **National Mission on food processing:**
  1. Ministry of Food Processing Industries (MOFPI) launched a new Centrally Sponsored Scheme (CSS) - National Mission on Food Processing (NMFP) on 1st April 2012 for implementation through States/UTs.
  2. The basic objective of NMFP is the decentralization of implementation of food processing related schemes for ensuring substantial participation of State Governments/UTs.
- **Mega food parks:** The Scheme of Mega Food Park aims at providing a mechanism to link agricultural production to the market by bringing together farmers, processors and retailers so as to ensure maximizing value addition, minimizing wastages, increasing farmers' income and creating employment opportunities particularly in the rural sector.
- **Modernization of abattoirs:** The scheme aims at providing facilities for scientific and less painful slaughtering, chilling, effluent treatment plant, by-product utilization, water and power with required sanitary/phytosanitary conditions for modernization of abattoirs.
- **Cold Chain Infrastructure:** Scheme for Integrated Cold Chain, Value Addition and Preservation Infrastructure aim to encourage setting up of cold chain facilities to provide integrated cold chain and preservation infrastructure facilities without break from the farm gate to the consumer.

175. Boards and Institutions in food processing industry?

- NIFTEM – National Institute of Food Technology and Entrepreneurial Management.
- IGPB – Indian Grape Processing Board.
- IICPT – Indian Institute of Crop Processing Technology.
- NMPPB – National Meat and Poultry Processing Board.

176. Present Status and Future of Food Processing Industries in India?

- Gross value added in food processing increased from Rs. 1.30 lakh crore to Rs. 2.08 lakh crore in 5 years.
- Food Retail market is majorly dominated by Food Grocery (growing at CAGR 25%) and Food Services (growing at CAGR 15%) segments.
- India's exports of Agri-food products was USD 38.6 billion in 2020-21.
- FDI inflows from April 2014 to June 2021 amounted to USD 4.64 billion.
- India has already witnessed green and white revolution i.e. Agriculture and Milk.
- The focus is upon Pink Revolution: Meat and poultry sector.

177. Discuss the reasons for slow growth of processed foods in India?

- Majority of the population has low-income levels and cannot afford processed foods.
- The high cost of packaging pushes up the cost of the processed items and thereby makes them out of reach of the common man.
- Indians traditionally prefer fresh foods that are cooked rather than use preserved foods.
- There is also no national character for food habits and these keep changing from region to region.
- Transport (both road and railways) and communication are poor.
- There are no reliable cold chains, which are necessary for temperature sensitive foods like fruits & vegetables, ice creams etc.
- Supermarkets are not yet popular although a few are making an appearance.

178. Mention the important revolutions related to Food Production and Food Processing?

- Pink Revolution – Meat and Poultry Production.
- Silver Revolution – Egg/Poultry Production.
- White Revolution – Milk/Dairy production (Operation Flood).
- Yellow Revolution – Oil Seeds production.
- Evergreen Revolution – Overall development of Agriculture.
- Blue Revolution – Fish Production.
- Golden Revolution – Overall Horticulture development/Honey Production.

179. Suggests the measures which should be taken by the government to boost the food processing in India?

- **Storage capacities and infrastructure** should be increased.
- Develop the **agricultural facility** with good agricultural practice which leads to the transition from staple food crops to diversification of crops.
- Backward linkages to farmers need to be made more robust. **Contract farming** can be promoted. According to the **Model Contract Farming Act, 2018,** the contract will specify the quantity, quality and price of produce being supplied.
- **Skilling is required at two levels.** First at the farm gate in promoting agricultural best practices and in processing activities.
- **Public investment and connectivity** should be increased.
- **Farm pattern diversification** which leads to a production of variety of crops other than constant set of crops which creates lot of job opportunities.
- There should be a **Centre of Excellence** between centre and state.