Chapter - 10. Natural Vegetation:

Definition:

- Natural Vegetation which grown without the interference of man, adopted itself to the limitations of the natural environment. Natural vegetation now a day is most by found in parts of Himalayas, the debuts and the sidebars delta.

Geographical Factors:

- Climate, Soil, topography is the main factors of natural vegetation. The main climatic factors are temperature and rainfall. Drainage pattern also modified repetition to a greater extent.

Forest in India:

- Indian forests can be divided into following categories:
  - Tropical Evergreen Forests
  - Tropical deciduous or Monsoon Forests
  - Tropical Dry Forests
  - Littoral or Tidal Forests
  - Mountain Forests

Tropical Evergreen Forests:

Climatic Condition:

- Temperature: between 25°C to 27°C
- Rainfall: More than 250 cms

Characteristics:

- Dense growth of trees because of high rainfall.
- Due to the thick growth, light does not penetrate through as a result forest floor is quite dark.
- Looks green throughout the year

Important Trees:

- Mahogany, Rosewood, ebony, Sisam bamboos and canes.
- **Rose wood:** fine grained and hard, used for expensive furniture, floor boards and wagon parts.
- **Sisoo:** Hard and brown patches, used for furniture, agricultural implements, railways, sleepers.
- **Ebony:** Musical instruments, sports goods, piano keys.

Area:

- Andaman and Nicobar Islands, Meghalaya, western slopes of western Ghats Manipur, Assam, and west Bengal, Tripura

Tropical Deciduous or Monsoon Forests:

Definition:

- The deciduous trees are shed their leaves for about 6–8 weeks in the hot weather when they face water shortage. Economically, these are our most important trees.

Types:

- Moist deciduous
- Dry deciduous

Climatic conditions (Moist):

- **Temperature:** between 24°C to 27°C and
- **Humidity:** 60% to 80%
- **Rainfall:** between 100 cms to 200 cms.

Climatic conditions (Dry):

- **Temperature:** between 23°C to 27°C and
- **Humidity:** 51% to 58%
- **Rainfall:** between 70 cms to 100 cms.

Important trees:

Sal:

- **Characteristics:** Its wood is hard and heavy and immune to the attack of white ants
- **Use:** Its timber is useful for railway sleepers and house contraction.
- **Area:** Bihar, M.P., Chhattisgarh, Orissa, Tripura, Assam, West Bengal

Teak:

- **Characteristics:** Hard and durable timber.
- **Use:** Ship building, house construction and furniture making.
- **Area:** M.P., Chhattisgarh, Assam, Bihar, Maharashtra

Sandalwood:

- This tree provides sandal wood for handicrafts, sandal woods oil used for making perfumery. It is found in Karnataka

Semul:

- Its timber is soft and white. It is used for making packing cases. Match boxes and toys. Semul is found in Assam, Bihar and Tamil Nadu.

Amaltas:

- Medicinal value, cure asthma, leprosy and heard diseases.

Tropical Dry Forests:

Climatic Conditions:

- **Temperature:** average 25°C to 27°C
- **Rainfall:** less than 50 cms.

Characteristics:

- This tree consists of small size Kikar, acacias, and thorny bushes. These trees have long roots, small leaves, hard thorns and sharp spines to enable them to face the dry climate and protect themselves from animals.

Important trees:

- Hiker, Acacias, Babool, neem and thorny bushes.
  - Babool: Medicinal value, gum.
  - Neem: Skin infection, treating diabetes, allergies, ulcers.

Area:

- Rajasthan, Kutch and Saurashtra in Gujrat, South Western Punjab and parts of Deccan.

Tidal or Delta Forests (Littoral):

♦ Tidal and delta region have a special type of forest known as “tidal forest”.

Characteristics:

- The trunks of these trees are supported by a number of stilted roots which are under water during high tide. At low tide, their roots can be seen. In west Bengal, it is called Sundari.

Area:

- Deltas of the Ganga (Sundarbans in West Bengal), Mahanadi, Godavari, Krishna, Kaveri.

- Important trees: Gorjan, Hintal, sundari, keora used as a fuel wood.

Mountain Forests (Montane):

- Mountain forests are found in the mountain areas, stretching from Kashmir to Assam. The vegetation varies from mixed to deciduous and coniferous types depending on elevation and rainfall.
  - **Important Trees:** Spence, silver fir, cedar, pine, deodar birch and elm, cedar.
  - **Chir Pine:** It is useful for extraction of resin and turpentine tea chests also. It is found mainly in Kashmir UP and Punjab.
  - **Deodar:** It is a very, large coniferous tree. Its wood is durable and oily, and used for making railway sleepers and house constriction

Forest Conservation:

- Forests are a unique gift from nature to man they play an important role in the national economy of India. Forest is a renewable resource.

Definition:

- Forest conservation means the proper use of forest resources without causing any adverse, effect on our economy and environment.
- Now a day, forest enervation programmed is very important for environmental protection.
- Vanamahotsava and Chipco movement are very good examples of public awareness.

Objectives of forest conservation:

- Check indiscriminate deforestation
- Reforestation should be carried out in quick succession.
- Shifting cultivation needs to be controlled.
- Prevention of overgrazing
- Fresh a forestation programme is very important to take care of forest courses ovation.

QUESTIONS AND ANSWERS

Section I: [2 Marks]

1) What is flora? What is its importance?

Ans: It refers to natural vegetation growing in a particular area

2) What is the requirement of rainfall for tropical rain forests?

Ans: 200 cm and above

3) What is the requirement of rainfall for tropical rain forests?

Ans: It is above 24°C

4) What is virgin vegetation?

Ans: Natural vegetation grown without human aid or interference / disturbance

5) What is endemic vegetation?

Ans: It is purely Indian vegetation.

6) What is exotic vegetation?

Ans: The vegetation came from the places outside India.

7) Where can we see natural vegetation in India?

Ans: Only in some inaccessible regions like the high peaks of the Himalayas and the interior of the Thar desert.

8) Name the important trees of the thorn and scrub forests.

Ans: These are (i) Babul. (ii) Kikar, (iii) Khair and (iv) Date palm.

9) Name major vegetation regions to which Acacia and Teak trees belong.

Ans: (i) **Acacia:** Thorn forest, (ii) **Teak:** Tropical deciduous forests.

10) Which are Tropical Forests?

Ans: The forests located in regions at southwards to the Tropic of cancer are tropical forests. These are of two types (i) Tropical rain or evergreen forests and (ii) Tropical deciduous forests.

11) Where are the Thorny and Shrubby forests located?

Ans: These are located in Kutch, parts of Saurashtra (Gujarat), Rajasthan, Punjab, Haryana and low rainfall regions of Maharashtra state.

12) Where are located the sub–tropical and temperate forests?

Ans: These are located in the Himalayan mountainous region.

13) Where are seen the tropical deciduous forests?

Ans: These are seen in Madhya Pradesh, Chhattisgarh, Orissa, Bihar, Jharkhand, Maharashtra and Kerala.

14) Mention the percentage of forest cover in India

Ans: It is 21.2% of total land area of India. It means approx. 12% less than desired area.

15) Name two sub–divisions of tropical deciduous forests.

Ans: These are (i) Moist deciduous and (ii) Dry deciduous.

16) What is the period of shedding leaves of tropical deciduous forests?

Ans: It is six to eight weeks in summer.

17) Name the famous mangrove tree the Ganga–Brahmaputra delta.

Ans: It is Sundari tree.

18) What is meant by natural vegetation?

Ans: Natural vegetation is meant by plant cover that grows in natural conditions and has not been disturbed over a long time.

19) What do you understand by flora?

Ans: Flora refers to plants of a particular region of period, listed as species and considered as a group.

20) Distinguish between flora and vegetation?

Ans: Flora refers to plants of a particular region or period, listed as species and considered as a group. Whereas vegetation refers to the assemble of plant species living in association with each other in a given environmental set–up

21) Name the types of Tropical Deciduous forests.

Ans: Types of Tropical Deciduous forests are as under:

i) The Moist Deciduous Forests
ii) The Dry Deciduous Forests

22) Name the types of Mountain forests.

Ans: Types of Mountain Forests are as under:

i) The Northern Mountain Forests
ii) The Southern Mountain Forests

23) What are the characteristic features of Littoral forests? Where are they found in India?

Ans: The Littoral forests have mainly evergreen species of varying density and height. Usually associated with wetness. The tree trunks are supported by a number of stilt like roots which are submerged under water and profuse growth with tangle of climbers. These forests are found in West Bengal and coastal areas of Andhra Pradesh and Orissa.

24) What are the economical values of the Northern Mountain forests?

Ans: The Northern mountain forests include the Himalayan ranges. The Himalayan trees provide fine durable wood for commercial uses. They provide timber which is used for construction work, for railway sleepers, for making light furniture, packing boxes, wood pulp, paper, etc. They also provide resins, gums, fruit, roots, medicinal plants, herbs, etc.

25) Mention the uses of the mangrove and the sundry trees.

Ans: The mangrove trees are utilized for fuel and the sundry trees provide hard durable timber for construction, building purposes and boat making.

26) Write the importance of forests?

Ans: The forests are one of the most significant features of land. They are prime sources of energy required for all life forms. Forests provides a number of resources to mankind like food, wood and medicines.

27) Name the conservation measures based on National Forest Policy?

Ans: i) Social forestry ii) Agro forestry.

28) What is social forestry? Give another two names of social forestry?

Ans: Social forestry refers to the management and protection of forests and afforestation on barren lands with the purpose of helping in the environmental, social and rural development.

29) Why is it necessary to increase the area under forest in India?

Ans: Area under forest is very rapidly decreasing. It is now 21% of land are in India. It should be at best 33% of the land area. So, it is very necessary to increase the area under forest in India. Our population is increasing. We need wood, fruit, roots, and barks from industries. Thus, forests should be necessarily increased.

Section II: [3 Marks]

30) Distinguish between the moist and dry deciduous forests.

Ans:

Moist Deciduous Forests	Dry Deciduous Forests
hese are found in areas receiving annual rainfall between 100 cms and 200 cms.	hese forests are found in areas receiving annual rainfall between 70 cm and 100 cms.
ees found in these forests are teak, sal, shisham, sandalwood, Khair and bamboos.	the open stretches of dry deciduous forests teak and palash etc. trees are grown.
hese forests are generally found in Jharkhand, Maharashtra, Madhya Pradesh, west Orissa, Chhattisgarh and on the eastern slopes of the Western Ghats.	hese forests are found in dry regions of U.P., Bihar, Jharkhand, Orrisa states and rainier Parts of Deccan plateau.

31) Distinguish between Tropical deciduous forests and temperate forests with grasslands.

Ans:

Tropical Deciduous Forests	Temperate Forests with Grassland
These are the most dispersed forests of India.	hese are confined to mountainous areas.
hese are spread over a region receiving rainfall between 200 cms and 100 cms.	hese are spread over snowfall regions and high altitudes.
hese are found in north–eastern states along the foothills of the Himalayas, Jharkhand, Orissa, Chhattisgarh and on the eastern slopes of the western Ghats.	hese are grown in southern slopes of the Himalayas and places of high altitudes in southern and north–east India.
ees of these forests–type shed their leaves for about six to eight weeks in dry summer.	vergreen broad leaf trees are found here.
he trees found in these forests are: sal, teak, plash, arjun, mahua, peepal, sandalwood and bamboo.	ere are grown apples, pears, cherries etc. fruit trees. Oaks, chestnuts, pine, cedar, silver fir are the other common trees.
he animals found in these forests are: lion, tiger, pig, deer, elephants.	ashmiri stag, spotted deer, wild sheep, jack rabbit, yak, snow leopard, antelope are the common animals found here.

32) Distinguish between reforestation and afforestation.

Ans:

Reforestation	Afforestation
is practiced in areas where forests have been destroyed.	ew forests are planted in the new areas
wo saplings are planted to replace every felled tree.	ne sapling is planted to get one tree.
is practiced to avoid the evils of jhumming agriculture.	is practiced to bring more area under forests

33) Give four characteristics of tidal forests.

Ans: Characteristics of Tidal Forests:

i) These forests are found in the deltas.
ii) The trees grown here are able to survive in both fresh and saline waters.
iii) Mangrove are the common varieties with roots of the plants submerged under water Eg. Sundari trees in Sundarbans.
iv) Apart from Sundari trees, palm, coconut, keora, agar, screw pine and amor are also found in tidal forests.

34) How much natural is the natural vegetation of India today?

Ans: i) In order to answer this question, we would first state what vegetation is. It actually, refers to plant life in general and grown at a particular place or types its specific meaning. It include of algae, lichen, numerous type of grasses, the shrubs and scrubs and different types of trees. All plant species, flowering and non–flowering including medicinal plants are covered under plantation.

ii) The natural vegetation is meant by a plant community that has been left undisturbed over and left undisturbed. It is also called virgin vegetation. The cultivated crops and fruit orchards, form part of vegetation but we cannot say them natural vegetation.

iii) Again the virgin vegetation purely Indian are called endemic and those which have come from outside India are termed as exotic vegetation or plant species. When we consider the point in this view, we see vegetation cover in most parts of India is no more natural in the real sense.

35) Why is it important to raise the land area under forests?

Ans: i) A survey done in 2003 reveals that out of the total 32.87,782 sq. kms, India has now been left with only 6.8 lakh sq. km. land under forest cover which account for only about 21% of total area. It is not good indication for healthy living of organisms. It merely shows disturbed picture of ecological balance.

ii) The optimum forest cover of 33% to the total area of any country has been reported by an international convention on environment. Owing to this dismal state of affair has become necessary to raise the land area under forests to maintain or restore ecological balance. Extension of forest land will in turn provide habitat to wildlife and help their preservation.

iii) It will minimize incidence of droughts, more and more rainwater will percolate in the subsoil as also regulate the flow of river water in both rainy and dry seasons. This effort will conserve the soils from erosion and help in reducing the volume of flood waters and their fury.

36) How do the forests play both a productive and protective role?

Ans: **Productive Role:**

i) The forests supply us wood, pulp, cellulose, packaging material etc. to run a number of industries like paper industry, packaging industry

ii) A number of consumer goods like fuel wood, timber, medicinal herbs, resins, gums, lac and honey we obtain from our forests.

iii) These provide livelihood for many communities.

iv) Forests control the wind force and temperature and cause rainfall.

Protective Role:

i) Forests help in maintaining the ecological balance and providing pollution free air.

ii) These provide natural habitat to wildlife.

iii) These help in checking soil erosion and raise the water table receding presently at a faster speed.

iv) These provide humus to the soil and make it fertile.

v) These provide manure to the plants as their leaves and stems after they die, decompose in a natural way.

37) Describe the altitudinal zones of vegetation In the Himalayan regions.

Ans: Type of vegetation changes according to altitude in the Himalayan region. This is so because temperature decreases with increasing altitude i.e. 1°C after every 165 mts.

i) In the foothills, tropical deciduous forests especially Sal trees are found.

ii) Between 1000 to 2000 mts. above the sea levels, evergreen forests and trees of beech, chestnut, oak, etc. are found.

iii) Between 1600 to 3300 mts. above the sea level, coniferous forests are found. Here are seen trees of pine, cedar, silver fir and spruce.

iv) Above 3600 mts. forests yield place to Alpine grasses and Alpine grasses through shrubs and scrubs.

38) Describe the major zones of vegetation in India.

Ans: Vegetation means the original land cover consisting of forest vegetation. India even today possesses a great variety of natural vegetation which can be divided in following vegetation regions:

i) **Tropical Rain Forests:** These forests are found on the western slopes of Western Ghats, Assam, Meghalaya along with the adjoining states of north-east India. These are generally evergreen forest because no definite time for trees to shed their leaves. Trees reach great heights up to 60 mts. or even above in these forests. All kinds of trees, shrubs and creepers give it a multiplier structure. They thrive in areas having more then 300 cm. rainfalls every year. The forests along the west coast of India and north-east side are less dense and have deciduous and evergreen trees. As these forests are inaccessible, they are of little commercial use. Ebony, Mahogany, Rosewood, Rubber, Shisham, Sal, Bamboo are grown in these forests. Animals like elephants, monkey, several species of birds, lemur, bats, sloth, reptiles, deer, scorpion, snails and one horned rhinoceros are found in these forests.

ii) **Tropical Deciduous Forests:** These are the most dominant and wide-spread vegetation type in India.

Characteristics:

a) These forests are found in Madhya Pradesh, Chhattisgarh, Odisha. Bihar, Jharkhand, Maharashtra and Kerala states.

b) The trees in these forests shed their leaves during the dry summers.

c) Trees of teak, sal, palash, arjun, mahua, peepal, sandalwood and bamboo and thick undergrowth are found in these forests.

d) The moist deciduous forests are found in areas receiving annual rainfall between 200 and 100 cm. while the dry deciduous forests are found in areas receiving annual rainfall between 100 and 70 cm.

e) These forests are economically very useful for India.

iii) The Thorn Forests and Scrubs Characteristics

a) These forests are grown in areas which have less than 70 cm of rainfall.

b) These consists of thorny trees and bushes.

c) These are found in Kachchh parts of Saurashtra, Rajasthan, U.P., Punjab, Haryana and low rainfall regions of Maharashtra.

d) Trees of babul, cacti, acacias, palms, euphorbias, thorny bushes and short grasses are grown in these forests.

iv) Alpine and Tundra Vegetation Characteristics

a) It is found at high altitudes, generally more than 3600 mts. above sea level.

b) Silver fir, junipers, pines and birches are the common trees found here.

c) These are used extensively for cattle grazing by nomadic tribes (i.e. Gujjars & Bakarwals)

v) Tidal Forests:

a) These are found in areas of tide influence coasts viz. in deltas of peninsular rivers including Orissa, Andhra Pradesh and Tamil Nadu.

b) Mangrove trees like Sundari are found here

c) In some parts of deltas, palm, coconut, keora, agar, screw pine. amor are found.

d) The trees grown here are useful for manufacture of perfumed oil, perfumes, papers etc.

39) Write the uses of important trees of the Dry Deciduous forests.

Ans: The important trees of the Dry Deciduous forests are teak, tendu, sal, rose wood, palas, amaltas, bel, khair, axlewood, etc. The uses of these trees are as under.

i) Tendu leaves are used as wrappers for bidi making.

ii) The wood sal is used for making beams, doors, window posts of houses, railway sleepers, etc.

iii) Palas leaves are used in rearing shellac worms.

iv) The fruit, seed, pulp and roots of amaltas have medicinal value. It helps in relieving the symptoms of asthma, leprosy, ringworms, fever and heart related diseases.

v) The wood of khair is used for making rice pestles, hookahs, ploughs, etc. The wood extract is used for tanning and dyeing.

40) Distinguish between social forestry and agro–forestry?

Ans: .

Social Forestry	Agro–Forestry
refers to the management and protection of rests and afforestation on barren lands.	refers to the sustainable system of anaging a piece of land through combined oduction of agricultural crops, forests ops and animal rearing, to ensure the most fficient land use under a management ystem
aims to help in the environmental, social and rural development	aims to provide conservation of the land and its improvement

41) Explain the important features of social forestry.

Ans: The important features of social forestry include the following.

i) Raising plantation by local people's participation.

ii) Taking the pressure off the forests and making use of all unused and fallow land.

iii) Letting local socio–economic condition govern the structure and function of the forestry.

iv) Ensuring quick benefits, sustainable forestry along with short crop rotation is applied.

v) Making use of easily implementable technology.

vi) Distributing the benefits derived from such projects equally among the people and socio– economically backward people.

42) Describe the objectives of National Forest Policy?

Ans: The objective of National Forest policy are:

i) Preservation of ecological balance and conservation of natural heritage.

ii) To control erosion of soil, denudation in catchment areas and extension of sand dunes in the north–

west desert region and along the coasts.

iii) To provide rural and tribal people their requirement of forest products.

iv) Utilizing products of forestry in the best manner possible.

v) Increasing the productivity of forests as well as the forest cover by afforestation programmes among others.

vi) Involving the people to meet the objectives.

PREVIOUS YEARS BOARD QUESTIONS:

1) a) What are 'Tidal forests'? Name two typical trees found there.
   b) Write two main characteristics of the Deciduous Monsoon Forests.
   c) Name the type of forests found in the western part of the Western Ghats. Give two reasons why these forests are so named.
   d) Mention three methods for the conservation and development of forests in India. [2011]
2) a) Mention two reasons why Tropical Evergreen Forests are difficult to exploit for commercial purposes.
   b) Give two characteristics of tidal forests.
   c) Mention three reasons why forests must be conserved.
   d) Name any three trees found in monsoon deciduous forests and state one use of each of these trees. [2012]
3) a) Mention two main characteristics of Tropical Rain Forests.
   b) Name the tree, the timber of which could be used for the following:
      i) A soft and white timber used for making toys and match boxes.
      ii) A hard durable timber used for ship building and furniture making.
      iii) A sweet smelling timber which yields on oil, used for making handicrafts.
   c) i) Name one region in India for each of the following:
      (1) Tidal forests (2) Thorn and Scrub
      ii) Explain why Thorn and Scrub forests are found in the above mentioned region.
   d) Briefly explain two reasons for forests being an important natural resource. [2013]
4) a) Write two reasons why monsoon deciduous forests are commercially more valuable than other types of forests.
   b) How do forests –
      i) have a favourable effect on the climate of the region?
      ii) act as a flood control measure?
   c) Give one important use of each of the following types of trees:
      i) Sundri ii) Sandalwood iii) Rosewood
   d) Name the natural vegetation largely found in the following regions:
      i) The delta of the Ganga River.
      ii) The windward side of the Western Ghats.
      iii) The Deccan plateau. [2014]

Chapter 11: Water Resources

- India is an agricultural country and for successful agriculture, water is an important resource input. Nature has endowed India with plentiful water resources like rivers tanks, ponds, lagoons etc.
- Agriculture needs water at the right time. So irrigation is the key to the success of India's agriculture because of the following reasons:
  - **Uneven distribution of rain:** place like Assam and west Bengal receive 150–250 cms. Whereas Rajasthan rarely gets even 25 cms.
  - **Seasonal rainfall:** India's rainfall concentrated over 4 months rest of the year is mostly dry. Indian monsoons are most uncertain. Only irrigation can provide security to agriculture from such irregularity.

- **The main factor of the Green Revolution** is the application of regular water supply to the high yielding crops. So, irrigation is very necessary even though rainfall is sufficiently available and regular
- In a country like India the need for food is increasing because of the increasing population. It is important that all possible agricultural land be brought under cultivation. This can be made possible only through irrigation.

Method of Irrigation:

- Irrigation practiced in India divided into two main categories:
  - Primitive Methods (Well, tanks, inundation)
  - Modern Methods (Tube well, Sprinkler irrigation, Multi–purpose)

Wells:

- Wells are an age–old method of providing water for agriculture, drinking and for other household purpose. A hole is dug in the ground to obtain sub soil water. Wells are the simplest and the cheapest source of irrigation.

Area:

- Uttar Pradesh, Rajasthan and Punjab

Advantages:

- Wells are simplest and cheapest source of irrigation.
- It is an independent.
- Source of irrigation and it may be used as and when the necessity arises.
- Wells can be dug at any convenient place.

Disadvantage:

- A well can water only a limited amount of land.
- Well dry up during the dry summer and fail to provide water.
- It is time – consuming and brackish also.

Tank Irrigation:

- This type irrigation is earthen or masonry walls across a stream or depression. Rain water collects there and it is used when needed specially in the dry season. Tanks are of various sizes, big and small.

Area:

- Andhra Pradesh, Tamil Nadu, Karnataka, Orissa, Bihar and West Bengal.

Advantage:

- The hard rocks underlying large areas in the Deccan do not allow percolation of water easily.
- The undulating surface forms natural depressions. These follows may have a simple dam across them. So, tanks are simple and easy and cheap to build.
- Tanks also help in raising the underground water level of wells founds in the surrounding areas.
- Inspite of irrigation in many villages tanks form the only source of water for domestic purpose.

Disadvantages:

- Tanks occupy large surface area, which could otherwise have been used for cultivation.
- Many tanks dry up during the dry season and fail to provide water for irrigation when it is required more.
- Silting of tanks is a problem, and desilting of these tanks is often required.

Inundation Canals:

- This canals are 'flood–water' Canals and have water in them only when the river is flooded during the rainy season. These canals are taken out from rivers without any regulating systems like weirs at their head. This type of canals is found near river Sutlej.

Modern Methods:

- Modern methods of irrigation are an improved version of old method. They are more reliable as well as easy to operate and irrigate more area also large amounts of water can be pumped up by an electric pump which is not possible in an ordinary well.

Tube Wells:

- Tube Wells have been found where ground water is available in plenty and is fair close to the earth surface.

Advantages:

- A tube well can water a much larger area.
- They are better and more reliable during periods of drought when a surface well dries up.
- They are also suited to areas of small holding.

Disadvantages:

- These area should be sufficient supplies of ground water
- There must also be regular supply of cheap electricity.
- The region must be fertile and productive so that the cost of construction and operation of the tube well may be recovered from increased farm production.

Area:

- Uttar Pradesh, Bihar, Punjab, Haryana, Rajasthan, West Bengal

Canals:

- These are a very effective source of irrigation in areas of low water.
- More than 15 million hectares are irrigated be canals.
- The digging of canals in rocky and uneven areas is difficult and canals are practically absent at the peninsular plateau.

Area:

- Punjab, Haryana, Rajasthan and Bihar, Andhra Pradesh, Madhya Pradesh, Orissa and Tamil Nadu,

Advantages:

- Canal water is rich in sediments brought down by rivers. These sediments add fertility to the fields.
- Most of these canals are perennial and provide water for irrigation whatever needed.
- Although initial costs are high canal, irrigation is quite cheap in the long run.

Disadvantages:

- Unless canals are fined the canal problem of water logging.
- Large areas of Punjab, Haryana and Uttar Pradesh suffer from the problem of 'reh' or salts in the upper layers of the soft and makes large areas unfit for cultivation.
- Marshy areas near canals become breeding grounds for mosquitoes resulting in wide spread malaria.

Sprinkler irrigation:

- This type of irrigation is called cover head irrigation. It is set up in the fields and supplied with water by hoses from the source of water.
- There is no loss of water by seepages, because water is supplied through pipes.
- No water is lost by evaporation because water is supplied directly onto the fields by a sprinkler and there is minimum wastage. It is very expensive method.

Area:

- Desert areas, hilly areas

Multi Purpose Projects:

Definition:

- In our country, India has launched several multi–purpose projects. They are so called because they serve a number of purposes at the same time. They are made by constructing dams across rivers which flow throughout the year.

Objectives:

- To help store water which can be used for irrigation.
- To use water stored behind the dams for the generation of hydro–electricity.
- To help contort floods.
- To provide afforestation in the catchment areas of the reservoirs.
- To provide drinking water.
- To utilize them for the purpose of soil conservation.
- To use the canals for navigation.
- To develop pisiculture (raising of fish) and recreational centres.

Important Projects:

Name of the Project	States	River	Dams	Irrigated area	Crops

Bhakra–Nangal	Punjab, Haryana, and Rajasthan	Sutlej	Bhakra and Nangal	Punjab, Haryana, and Rajasthan	Wheat, long–staple cotton, sugar con, Pulses, Oil seeds
Hirakud	Orissa	Mahanadi	Hirakud dam	Orissa, Part of Andhra–Pradesh	Rice, Jute, Oil seeds
Rihand	Uttar Pradesh	Rihand	Rihand dam, Gobind Vallab Pant Sagar	Bihar	Sugarcane, rice
Damodar – Valley Corporation (based on Tenne-ssee Valley Authority of USA)	West Bengal, Bihar	Damodar, Barakar, Konar	D.V.C. (Damodar Valley Corp)	Hugli, Howrah, Bankura, Burdwan (West Bengal)	Rice, jute, pulses sugarcane
The Tunga–Bhadra Project	Andhra Pradesh and Karnataka	Tunga–Bhadra	Tunga–Bhadra	Karnataka, Tamil Nadu	Rice

Problems of Water Resources:

- **Availability:** Availability of potable water is very less through our country is surrounded by the water surface.
- **Use:** If the present trend of water requirement and its wastage continues then a large water shortage problem will come.
- **Quality:** Water quality refers to the purity of water most of our surface waters area polluted by forcing matters River mostly carry industrial waste, municipal sewage, residuals of chemical fertilizer pesticide etc. making it unfit for human consumption.
- **Conservation:** Conservation of water resources has become essential due to its short supply, increased demand, large scale pollution and uneven distribution, over the country.
- The **Central Pollution Control Board** (CPCB) is working with the state Pollution control Boards monitoring the quality of water resources.

Recycle and Reuse of Water:

- Fresh water can be improved by recycling and reusing water. Water of inferior quality can be used for firefighting and cooling, car washing, gardening, and house hold purposed.
- **Conservation:** Water shed development is an important method to conserve water resources, increase, agricultural development and stop environmental degradation.
- Tanks, ponds, check–dams and other structure have been constructed for water harvesting.
- In Tamil Nadu water harvesting is mandatory for every building.
- One method to tackle the problem of large scale water depletion is to capture ground water and store it underground to need house hold needs

The objectives of rainwater harvesting:

- Meet the increasing demand for water and
- Reduce surface run off and avoid flooding of roads.
- Improve the quality of ground water and reduce ground water pollution.
- Reduce soil erosion.
- Raised the ground water label by adding to ground water reserves. There are many tow cost methods. Which can be used to recharge ground water?
  - Roof top water harvesting
  - Recharging hand–pumps
  - Recharge through trenches and bunds and stop– dams on small streams.

QUESTIONS AND ANSWERS:

Section I: [2 Marks]

1) What is a multi-purpose project? Mention any two purposes served by a multi–purpose project.

Ans: Multi-purpose river valley projects are meant to tackle various problems associated with river valleys in an integrated manner.

a) They control floods b) They check soil erosion.

2) Explain two reasons for conservation of water.

Ans: Reasons for conservation of water are:

a) Limited water availability.

b) Unevenly distributed and polluted water bodies.

3) Mention three major sources of irrigation in India. Which source of irrigation is more popular in the southern states?

Ans: The three major sources of irrigation in India are:

a) Canals b) Wells and tube wells c) Tanks Tank irrigation is more popular in the southern states.

4) Name some natural water resources.

Ans: Rivers, lakes, ponds, lagoons, etc.

5) Define the term irrigation

Ans: Irrigation is the process of watering of agricultural plants through artificial means.

6) Name four surface water resources

Ans: River, lakes, ponds and tanks.

7) Mention the factors based on which different means of irrigation are used.

Ans: The availability of surface and groundwater, relief soils and climatic conditions.

8) Give two advantages of Well irrigation.

Ans: i) It is inexpensive to dig a well even poor farmers can irrigate their fields lifting water from a well
ii) Using pumps and tube wells, water can lifted even from great depths.

9) Give two disadvantages of well irrigation.

Ans: Electricity and diesel are essential to operate tube wells. They are so costly for farmers. It causes many problems in operation.

10) Name the two types of irrigation canals.

Ans: (i) Inundation canals, (ii) Perennial canals.

11) Name the areas where canal irrigation is in practice.

Ans: Uttar Pradesh, Madhya Pradesh, Andhra Pradesh, Rajasthan and Haryana, Jammu and Kashmir, Assam and Tripura.

12) Give two reasons why tanks are used for irrigation in the Deccan.

Ans: i) In the Deccan the rivers are depend on the rain water.
ii) In the Deccan tanks can be easily made by means of making dams in hollows spaces.

13) Name the three modern irrigation methods.

Ans: (i) Furrow irrigation (ii) Spray irrigation (iii) Drip irrigation.

14) What do you understand by watershed management?

Ans: Watershed Management refers to the efficient management and conservation of both the surface and ground water resources. It includes prevention of runoff water and storage and recharge of groundwater by various methods like percolation pits, recharge wells, borewells, dugwells, etc.

15) What is meant by water harvesting?

Ans: Water harvesting means to understand the value of rain and to make optimum use of rainwater at the place where it falls.

16) What are the advantages of tank irrigation?

Ans: They are suitable for areas with impermeable rock structure and with slightly undulating topography, where the rainfall is highly seasonal. This is highly significant in storing rain water

17) State the disadvantages of tank irrigation.

Ans: The tank irrigation system renders vast fertile lands, adjoining the tanks, as useless; large and shallow water mass permits enough evaporation to result in considerable loss of water. Tanks are not a very dependable source of irrigation, they depend on rains for water to be stored and are not a perennial source. The importance of tanks as a source of irrigation is on decline.

18) Name the areas where tank irrigation is practiced.

Ans: Andhra Pradesh, Tamil Nadu, Telangana,.

19) Name the major canals of Rajasthan.

Ans: The Indira Gandhi Canal, Bikaner Canal and Canals of the Chambal projects.

Section II: [3 Marks]

22) State two factors of water harvesting briefly.

Ans: **Storage facility:** We can store rainwater for ready use in container above ground or below ground.
Recharge facility: Rainwater may be charged into the groundwater aquifers. This can be done through any suitable structures.

23) State any one advantage and disadvantage of canal irrigation.

Ans: **Advantage:** Canals are perennial and provide water for irrigation whatever needed in major parts of Tamil Nadu to make up the lack of rainfall during summer

Disadvantage: Unless canals are fined the canal problem of water logging. Large areas of Punjab, Haryana and Uttar Pradesh suffer from the problem of 'reh' or salts in the upper layers of the soft and makes large areas unfit for cultivation. Marshy areas near canals become breeding grounds for mosquitoes resulting in wide spread malaria.

24) Mention any three measures for conservation of water resources.

Ans: The steps for conservation of water resources are:

a) Creation of more water storage reservoirs
b) Inter-basin transfer of water
c) Measures to raise underground water level
d) Watershed development.

25) State any two objectives of rainwater harvesting.

Ans: The objectives of rainwater harvesting are:

a) To reduce run off water
b) To raise the water table
e) To reduce ground water pollution
d) To avoid flooding of roads.

26) Give the meaning of rainwater harvesting. State any two points that should be kept in mind for efficient management of water.

Ans: Rainwater harvesting is a technique of increasing the recharge of ground water by capturing and storing rain water by constructing structures, such as dug wells, percolation pits, and check dams.

For efficient water management we should keep the following in mind:

a) Stop the use of treated water for gardening and toilets.
b) Create awareness by involving the people.
c) Registering tube wells and bore wells.
d) Prevent pollution of water bodies.

27) What is a multi-purpose river valley project? State any two purposes which are fulfilled by a river valley project.

Ans: A multi-purpose river valley project consists of a dam or series of dams on a river or rivers.

These projects are meant to serve several purposes:

a) Irrigation
b) Electricity
c) Control flood
d) Check soil erosion
e) Inland navigation
f) Fisheries
g) Wildlife

28) Name the different multipurpose river valley projects of India.

Ans: a) Bhakra Nangal project on River Sutlej
b) Damodar valley project on river Damodar
c) Hirakud project over the Mahanadi river
d) Tungabhadra project on river Tungabhadra
e) Nagarjuna Sagar project on river Krishna.

29) Describe how modern adaptations of traditional rainwater harvesting methods are being carried out to conserve and store water.

Ans: a) Roof top rainwater harvesting is being undertaken to store water
b) Constructions of bunds and check dams to collect run off of water
c) Construction of open tanks to collect and store water.

30) State the objectives of a multi-purpose river valley project.

Ans: a) Generate electricity
b) Water supply for domestic and industrial use
c) Inland navigation
d) Fish breeding
e) Check soil erosion
f) Control floods.

31) State the demerits of a multi-purpose project.

Ans: a) Regulating and damming of rivers affect their natural flow causing poor sediment flow and excess sedimentation at the bottom of the reservoir.
b) It results in rockier stream beds and poorer habitats for the rivers' aquatic life.
c) The reservoirs that are created on the flood plains submerge the existing vegetation and soil leading to its decomposition over time.
d) It leads to large scale displacement of local communities.
e) Irrigation has changed the cropping pattern of many regions with farmers shifting to water intensive and commercial crops.
f) It has increased the social gap between rich land owners and the landless poor.

32) Why are some river valley projects called 'Multi-purpose Projects'? Explain any five purposes

fulfilled by multi-purpose projects.

Ans: Multi-purpose river valley projects are meant to tackle various problems associated with river valleys in an integrated manner.

a) They control flood
b) Check soil erosion
c) Provide water for irrigation
d) Generate electricity
e) Provide inland navigation
f) Preserve wildlife and develop fisheries.

33) What is rainwater harvesting? Explain five objectives of rainwater harvesting.

Ans: Rainwater harvesting is a technique of increasing the recharge of ground water by capturing and storing rainwater by construction structures such as dug wells, percolation pits, check dams etc.

Objectives of rainwater harvesting:

a) To meet the increasing demand for water.
b) To reduce run off.
c) To avoid flooding of roads.
d) To reduce groundwater pollution
e) To augment the groundwater storage and raise the water table.
f) To improve the quality of ground water.

34) Give reasons for each of the following

a) Different crops require different quantities of water.
b) Tanks constitute a special feature of irrigation in the Deccan.

Ans: a) Different crops require different quantities of water as some crops do not require water when they are maturing while other requires more water.

Kharif crops depends on the monsoon rains. In the absence of irrigation facilities they are grown as rained crops. Rabi crops are grown over the area where assured supply of irrigation is available. Zaid crops (summer crops) need more water to irrigate. Cash crops require frequent watering.

b) Tanks are suitable for the areas with impermeable rock structure as in the Deccan. On such places well cannot be made so tanks can be made easily in hollow spaces. There are many streams which dry up when the rain ceases and stored water is taken to fields through channels during the dry season.

35) Write a brief note on method of modern irrigation.

Ans: **Drip Irrigation:** It involves the slow application of water. In this method, water is used very economically, since losses due to deep percolation and surface evaporation are reduced to minimum. It has become most advanced method of irrigation. This method is used mainly to irrigate fruits and vegetables. In this irrigation perforated pipes are placed between rows of crops. This method is very much suited to arid regions.

Sprinkler Irrigation: This type of irrigation is called cover head irrigation. It is set up in the fields and supplied with water by hoses from the source of water. There is no loss of water by seepages, because water is supplied through pipes. No water is lost by evaporation because water is supplied directly onto the fields by a sprinkler and there is minimum wastage. It is very expensive method. This method is very much suited to desert area and hilly area.

PREVIOUS BOARD QUESTIONS:

1) a) Name two states in which well irrigation is widely used. Mention one advantages of well irrigation in India.
   b) Mention two disadvantages of tank irrigation.
   c) Give three reasons to justify the need to conserve water.
   d) Mention any three water harvesting systems practised in India. [2011]
2) a) Mention two advantages of rainwater harvesting.
   b) Why are inundation and one disadvantage that tube wells have over surface wells?
   c) Give two advantages and one disadvantage that tube wells have over surface wells.
   d) Where are tanks most widely used in India? Why? [2012]
3) a) Name two states in which tube wells are extensively used. Give a reason to explain its importance as a source of irrigation.
   b) Give two main reasons why water scarcity occurs in India.
   c) i) Name two states where perennial canals are widely used.
   ii) Briefly explain two reasons for perennial canals being a popular form of irrigation in the named states. [2013]

4) a) State two reasons why tank irrigation is popular in South India.
   b) Mention two advantages that surface wells have over inundation canals.
   c) Give one geographical reason for each of the following statements:
      i) Irrigation is necessary despite the monsoon.
      ii) The drip method of irrigation is the best among all modern methods of irrigation.
      iii) Canal irrigation leads to the ground around it becoming unproductive.
   d) Give three reasons for conservation of water resources. [2014]

Chapter 12: Minerals in India

Classification:

Metallic Minerals	Non–Metallic Minerals	Minerals Fuels
Iron ore, Manganese, bauxite	Limestone	Coal, Petroleum

- All minerals and mineral products are derived from rocks forming the earth's crust. The various mineral products of the rock system of India are the ores and minerals, which man has been used in his development throughout the ages.
- As one looks around, the tractor farming, the wide range of heavy machinery for mines, mills and factories, mineral fertilizers – all these bear ample testimony to the indispensability of minerals in the' life of man. The ever-changing techniques of construction, engineering, the raw materials for road, rail and air transport etc. demand an ever-increasing use of metals and minerals.
- An appraisal of the total mineral resources of India so far known to geologists brings home the fact that the mineral wealth of India is not inconsiderable for a country of her size and population.
- Nature has made a very unequal territorial distribution of minerals in Indian region. The vast alluvial plain tract of northern India is devoid of mines of minerals. The terrain of Bihar, Jharkhand and Orissa possesses the largest concentration of ore deposits such as iron, manganese, copper, thorium, uranium, aluminium, mica, phosphates and coal.
- Madhya Pradesh and Chhattisgarh also carry good reserves of iron and manganese ores, coal, limestone, and bauxite. Tamil Nadu has workable deposits of iron, manganese, mica, limestone and lignite.
- Gujarat, Maharashtra and Assam have crude oil (petroleum). Assam also bears tertiary coal. West Bengal's minerals are confined to coal and iron ore.
- The most important source of power in Indian Subcontinent is coal. It is used in industries, thermal power plants, railways, etc.
- Depending upon the carbon content and moisture, coal is divided into the following varieties:
  - **Anthracite coal:** It has a carbon content of 90% and burns without smoke leaving a little ash.
  - **Bituminous coal:** It has a carbon content of 50% to 80%.
  - **Lignite:** It is brownish in colour and has a carbon content of about 40%.
  - **Peat:** It has least carbon content and inferior to the other varieties.
- India is the largest producer of coal in South Asian region. Bihar, Assam, Jharkhand, West Bengal, Andhra Pradesh, Madhya Pradesh, Chhattisgarh and Maharashtra are the main coal producing States of India.
- Petroleum is an important fuel. The prosperity of a country depends to some extent on this fuel. Unfortunately, South Asian region generally lacks petroleum, however, there are some oil fields

  in India and Pakistan. India produces only one-third of her requirements. The remaining two- third requirements are met by imported petroleum.
- In India, the main areas of mineral oil deposits are:
  - Offshore in Maharashtra (Mumbai High is the largest producer of mineral oils in India.)
  - Digboi and Naharkatiya in Assam
  - Kalol and Ankleshwar in Gujarat
- The crude mineral oil is refined in refineries. There are 17 refineries in India.
  - Reliance Petroleum Limited is the only refinery in the private sector.
  - The Mangalore Refinery and Petrochemical Limited is a joint sector refinery.
  - 15 refineries are in public sector.
- Iron is a metal of universal use. It's uses have increased thousand fold since man discovered steel. There

is a wide variety of special steel to suit special purposes such as fatigue and acid- resisting steels, hard steel for machinery tools, stainless steel and other special steels for defence weapons.

- Iron is extracted from its ores – haematite and magnetite, which are oxides of iron.
- When these are smelted with coke, metallic iron is obtained.
- Iron-ore occurs in a large scale in India. Orissa, Jharkhand, Chhattisgarh, Karnataka, Goa and Andhra Pradesh are the main producers of iron in India.
- Orissa accounts about one-third of total output of iron in India. The most important deposits occur in Sundargarh, Mayurbhanj, Cuttack, Shambalpur and Koraput.
- Jharkhand ranks next to Orissa in the production of iron ore. The iron ore of Singhbum is of the highest quality.

Distribution of Minerals (India):

a) Metallic:

Minerals	States and important Producing Centres /Other Countries	Uses
(Imp.) Iron ore: – India is very rich: ¼ of the world's reserves – Annual Production: over 40 Million Tonnes	NE Peninsular India(mainly the Chhotanagpur region) Bihar : Singhbhum, Orissa : Mayurbhanj, Keonjhar M.P. : Bailadila Karnataka : Kudremukh Tamil Nadu : Salem Goa	Used in the manufacture of iron and steel.
Manganese: – Very rich – Annual Production: 1.6 Million Tonnes	M.P. : Balaghat, Chindwara Maharashtra : Bhandara, Nagpur Gujarat : Panch Mahal Orissa : Keonjher Karnataka : Chitraldurg	Used as raw material for iron and steel industry. To make steel tough and rust proof. Removes impurities e.g. sulphur. For manufacture of heavy chemicals, bleaching powder, glass and electrical industries.
Bauxite (ore of aluminium): – Sufficient – Annual Production: 1.7 Million Tonnes	Bihar : Palamau, Ranchi M.P. : Jabalpur, Katni Maharashtra : Kolhapur Tamil Nadu : Salem Karnataka : Belgaum Gujarat : Kheda	It is the main ore for aluminium, which is used in aircrafts, automobiles, rail wagons, coaches shipping industry and household appliances, reflectors and mirrors.

b) Non–Metallic:

Minerals	States and important Producing Centres /Other Countries	Uses
Limestone: – Enough – 30.2 million tones	AP : Guntur, Kuddapah Gujarat : Junagarh, Kachchh Rajasthan : Ajmer, Jaipur, Jodhpur Karnataka : Bijapur, Shimoga M.P. : Durg, Raipur	Used mainly in the manufacture of cement. Used as flux in iron and steel industry; production of chemicals, paper glass and fertilizers.

Minerals: Fuels:

(Imp.) Coal: – Just sufficient – 102.0 million tonnes – Lignite Coal 3.6 million tonnes – 7th largest production in the world 234.11 million tonnes of reserves.	Bihar : Jharia, Bokaro, Gridih, Karanpura West Bengal : Raniganj M.P. : Singrauli, Korba Orissa : Talcher Also in AP, Jammu & Kashmir, Assam India's largest area is at **Neyveli** in Tamil Nadu.	Coal is the most widely used source of energy by industries and power generation. Largest consumers of coal are Indian Railways, Iron and steel industry.

(Imp) Petroleum: – India is poor – 12.0 million tonnes	Assam : Digboi, Moran, Naharkatiya Dibrugarh, Sibsagar Gujarat : Ankaleshwar, Kalol Khambat, Mehsana Mumbai high, Kaveri and Godavari basin, offshore areas of Andaman and Nichobar Islands.	Petroleum is the source of primary commercial energy. Used for electricity generation. Used for automobiles and aeroplanes. Products obtained are Petrol, diesel, kerosene, benzene, vaseline, paraffin wax, tar etc.

QUESTIONS AND ANSWERS:

Section I: [2 Marks]

1) What is the difference between metallic and non-metallic minerals? Name one each of the most abundant of these minerals found in South Asia.

Ans:

Metallic Minerals	Non–Metallic Minerals
These minerals are those which possess the physical properties of lustre, hardness and heaviness. The metals can be melted, and exist in chemical compounds. Only few occur in a pure state.	Some minerals that have no metals in them are used for extraction of non metals like sulphur, phosphorus, carbonate, etc. They are also mineral fuels.
In South Asia the most abundant ores are iron, copper, tin, zinc, lead, silver and gold.	Minerals like limestone, gypsum, mica, antimony, coal and petroleum are non- metallic minerals.

2) Why does India export iron ore on a large scale? Give two reasons.

Ans: i) Iron–ore is one of the most important mineral products of the Indian subcontinent. India occupies ninth position in world production. A lot is being consumed on the national front, as most of the iron and steel industries are located in mining areas. But it is also being exported on a large scale as the demand for steel has increased globally.

ii) The quality of iron-ore found is haematite. It is a good variety; India exports this to countries like Japan.

3) a) Name important ores of iron.

b) Which of these ores are found in India?

c) Give two features of these iron deposits.

Ans: a) Haematite, magnetite and limonite are iron ore deposits.

b) Haematite is widely found in India.

c) i) Iron ore deposits in India are not very far from the areas producing them,
ii) They have a low sulphur content.

4) i) Which Indian state leads in the production of iron ore?

ii) List the important iron-ore fields in the state of Orissa.

Ans: i) Karnataka. It accounts for nearly one-fourth of the iron output in India.
ii) Sundargarh, Mayurbhanj, Cuttack, Koraput, Keonjhar, Badampahar, Kiriburu, Bohnai etc.

5) Name the chief iron-ore producing areas in:

(a) Chhattisgarh, (b) Maharashtra and (c) Jharkhand

Ans: a) Chhattisgarh – Bastar and Durg districts.
b) Maharashtra – Ratnagiri, Raigarh and Satara districts.
c) Jharkhand – Singhbhum and Palamau

6) Name a few areas where iron ore is found in: (a) Andhra Pradesh, (b) Tamil Nadu and(c) Karnataka.

Ans: (a) Andhra Pradesh – Cuddapah and Chabali. (b) Tamil Nadu – Salem and Tiruchirapalli and (c) Karnataka – Kemmangundi, Baba Budan Hills.

7) Name the important oil fields in India.

Ans: i) Important oilfields in India are Mumbai High–it is an off shore oil reserve.
ii) **Oilfields of the Eastern region:** Digboi, Naharkatia, Rudra Sagar, Nunmati Bappapunga, Hansapunga, Naharkatiya and Moran in Assam.
iii) **Oilfields of Western region:** Ankleshwar, Koyali, Kolar, Kosamba, Sanand, Kathana, Navgaon in Gujarat, Cambay in Gujarat.

8) i) Name the oldest oil field in India.

ii) Name three other oil fields in the same region.

Ans: i) The first oil well was drilled at Digboi in Lakhimpur district of upper Assam in 1867.

ii) Other oil fields of the Eastern region are Digboi, Rudra Sagar, Nunmati Bappapunga, Hansapunga, Naharkatiya and Moran in Assam.

9) Name the source of crude oil for Mathura and Panipat oil refineries.

Ans: Mathura (U.P.) and Panipat (Haryana) oil refineries import crude oil, which is transported through pipelines for more than 1200 km from the Gulf of Kachchh. Some crude oil is also obtained from Mumbai High.

10) Name the largest deposits of oil and natural gas in India. Name the refinery associated with it.

Ans: The largest reserve of oil and natural gas is in Mumbai High. The region produces more than one third crude oil output of India. It is refined in the refineries of Trombay.

11) Name two inland centers of oil refineries in India.

Ans: The important inland centers of oil refineries are:

i) Nunmati, Numaligarh, Bongaigaon near Guwahati and Digboi in Assam.

ii) Barauni in Bihar.

iii) Mathura in U.P.

iv) Panipat in Haryana.

12) Name two coastal oil–refineries, one on the east coast and the other on the west coast of India.

Ans: **Oil–Refineries:**

East Coast	West Coast
Vishakhapatnam in Andhra Pradesh, Chennai in Tamil Nadu Haldia near Kolkata	Trombay (HPCL and BPCL) in Mumbai, Kochi in Kerala Mangalore in Karnataka

13) Name the types of rocks where mineral oil is usually found.

Ans: Mineral oil is a product of decomposition of organic remains embedded in sedimentary rocks of the Tertiary period. Petroleum is usually found in sedimentary rock formations like sand–stone, shale and limestone.

14) Explain why coal is often used near the source of production and mineral oil is often transported to great distances

Ans: Coal is a cheap and heavy mineral. Since coal is a bulky mineral, the transportation by road or rail is costly and time–consuming. It is therefore, used near the source of production.

Mineral oil, on the other hand, is a fluid substance. It can be transported through pipelines with minimum transportation cost. The laying of the pipelines is the only initial cost.

15) State two main drawbacks of the coal found in India.

Ans: The two main drawbacks of coal found in India are:

i) India does not have extensive deposits of the high grade coal i.e. Anthracite coal.

ii) Most of the coal produced is bituminous coal containing 50% to 80% of carbon content. About 60% of India's coal reserves are of inferior quality.

16) Distinguish between the conventional and non–conventional sources of energy.

Ans: **Conventional sources of energy:** (i) These are non–renewable sources of energy eg. coal and petroleum. (ii) These are going to last just for 100–200 years. (iii) These cause air and water pollution.

Non–conventional sources of energy: (i) These are renewable sources of energy eg. solar energy, wind energy. (ii) These are going to last forever. (iii) These do not cause any pollution.

17) Name two main areas of iron ore in Goa and in Karnataka.

Ans: i) Most of the iron ore of South Asia is produced in India. Goa is the largest producer of about 27% iron ore, through its reserves are small. Most of it is exported. The good quality haematite ore is mined at Sahqualim, Sanguem, Satari Ponda.

ii) Karnataka is the fifth major producer of iron ore. Reserves of magnetite and haematite are found here. Important deposits are at Bellary. Hospet, and the Bababudun Hills.

18) What is meant by the term Gondwana deposits?

Ans: i) The coalfields in India are divided into two classes. a) The Gondwana system, b) Tertiary beds. Gondwana deposits of coal are found in strata extending from Bengal, Jharkhand, Bihar and Orissa including Madhya Pradesh.

iii) 98% of Indian coal comes from this belt. The Gondwana region has high grades of coal. It is free from moisture but has sulphur and phosphorus in small quantities. They are located in rock strata and consist of coking and non–coking coal.

19) Under the present day system of consumption, minerals are on the verge of extinction. Do you agree? Give three reasons.

Ans: i) Minerals are important for the growth and development of the nation. There are two types of minerals- metallic and non-metallic. The Indian subcontinent is rich in mineral resources. But they are on the verge of extinction as they are not evenly distributed in the subcontinent. The locations found may not be ideal for exploitation, but they are still being exploited. Thus this is destroying valuable resources.

ii) The quantity and quality also vary. The regions with good quality may not be very well developed. The infrastructure may not be good. Over mining causes the quality of the mineral to degenerate.

20) Distinguish between Anthracite and lignite coal

Ans: **Anthracite:** (i) This is the best quality coal containing over 80% carbon. (ii) It has the highest heating value.
Lignite: (i) It is a lower grade coal containing about 60% carbon. (ii) It has the low heating value

Section II: [3 Marks]

1) With reference to iron ore, what type of iron ore does India produce and where? How has it contributed to its industrial development?

Ans: i) Iron ore produced in India are mainly the hematite type (the other two types are magnetite, and limonite). India has about 6.6% iron-ore reserves of the world.

ii) Iron ore deposits are found in Goa and Orissa which accounts for nearly one-third of the ore production. It is mined from the Keonjhar district, Jharkhand in Singhbhum and Palamau district, Chhattisgarh in Bastar and Durg district, Karnataka in Kemmangundi and Bababudin Hills, Andhra Pradesh in Guntur, Tamil Nadu in Salem and Maharashtra in the Lohara hills.

iii) Industrially, iron ore is very useful. As the ore is found near the coal, dolomite, limestone and manganese producing areas, it is well utilised in the iron and steel industry. This industry is regarded as an index of a nation's business activity and the standard of living. Thus it is a key to other industries

2) Why are most of India's oil refineries located along the coasts of India? Give two reasons. Ans: i) Large deposits of mineral oil is obtained from the continental shelf area, off the coast of Mumbai, Kachchh, Khambhat, Konkan, Malabar coast, Krishna and Kaveri deltas and Sunderbans, Oil has been found in Mumbai High. Bassein and Aliabet off the coast of Maharashtra and Gulf of Khambat. Oil refineries are set up along the coast to avoid transportation cost.

ii) Two–thirds of the crude oil is imported, hence the refineries are situated near major sea ports, e.g. Mumbai, Vishakhapatnam, Haldia near Kolkata, Kochi and Chennai. These cities are also large consumers of petroleum and petroleum products as they are important industrial centres.

3) What is "Off–shore Drilling"? What do you understand by Mumbai High?

Ans: Crude oil reserves are found in the coastal region and the off–shore continental shelves, e.g. off the coast of Mumbai. Drilling of oil done in the sea with the help of self–propelled jack–up type of drilling platform is known as "Off–Shore Drilling."

Mumbai High: The Oil and Natural Gas Corporation Ltd. (ONGC) of India, discovered oil on the continental shelf area, off the coast of Maharashtra about 176 km northwest of Mumbai.

It is known as '**Mumbai High'** because the syncline of the rock structure in which the oil has been found is higher than the normal height. Drilling of oil is done here with the help of Sagar Samrat, a self propelled jack–up type of drilling platform.

4) What are the uses of mineral oil?

Ans: i) Petrol and Diesel obtained from mineral oil are used as fuel for automobiles, aeroplanes, ships and locomotives.

ii) Kerosene oil, which is a byproduct of petroleum, is used as a domestic fuel and also used for the generation of electricity.

iii) By products such as lubricants, teryline, paraffin wax, tar and vaseline are used in industry.

5) Describe in detail the factors regarding coal production, under the following heads:

i) **Distribution of coal in India. (ii) Demerits of Indian coal. (iii) Need for conservation of coal resources**.

Ans: i) It is found in the Damodar region (West Bengal) i.e. Raniganj which has the oldest coal field. Coal is also mined in the Mahanadi region–Madhya Pradesh, Orissa, Jharia, Bokaro, Karanpura, Giridih, Talcher–Son river region in Madhya Pradesh in the Kanan Valley. In Maharashtra coal is mined in the Wardha valley, in Andhra Pradesh in Singereni, in Tamil Nadu in Neyveli, good quality coal is found in Goa.

ii) Indian coals are huge reserves mostly found in the Gondwana series in Peninsular India. About 2% of Indian coal is new (tertiary type). Bituminous coal which is good quality coal is very less in India. Lignite

coal the second variety is mined in Neyveli, Palna in Rajasthan. Indian coal is mostly peat i.e. inferior quality found in Bihar, Jharkhand, Madhya Pradesh and Orissa. This variety has a high ash content and low carbon content.

iii) Coal conservation means progress in industry. Hence new reserves of coal should be explored. Low grade should be blended with superior quality. Public and Private sector participation should be encouraged. New techniques in mining for production influx should be introduced. Steps should be taken to prevent wastage of coal.

6) Mention three environmental factors that must be kept in mind during mining activities

Ans: i) The mines in India are lack of infrastructure. They are very small and labour-intensive. Thus environmental pollution is seen.

ii) The mines incur heavy losses due to fires in the mines. The smoke causes heavy pollution to the surrounding areas, loss of life and property.

iii) The mines should have facility for disposal of waste, specially coal, as this waste causes pollution which is hazardous to health. New modern techniques are necessary as obsolete methods cause a lot of damage.

7) Name the different types of coal produced in India. Mention the characteristics of each type. Name the three types of coal found in India and state the uses of each.

Ans: a) **The different types of coal are:**

i) **Anthracite coal:** It has 90% carbon content. It is jet black in colour and burns slowly without smoke or soot. It is clean to handle and has high heating value.

ii) **Bituminous coal:** It has 50–80% carbon content. It is most widely found and used in India. Used for coke required for smelting of iron ore.

iii) **Lignite coal:** It contains 40% carbon. It is brown or brownish in color. It has large quantities of ash and moisture.

b) **The three types of coal found in India and their uses are as follows:**

i) **Anthracite coal:** It is used in manufacturing of iron and steel and steam generation.

ii) **Bituminous coal:** It is used in the smelting of iron ore and also in the generation of thermal electricity.

iii) **Lignite coal:** It is used in the production of thermal electricity.

8) Name the main coal bearing areas of India.

Ans: The coalfields in India are classified into two groups.

i) **Gondwana coal fields:** found mainly in Peninsular India in the states of Jharkhand, Orissa, Madhya Pradesh, West Bengal, Andhra Pradesh and Maharashtra.

ii) **Tertiary coal fields:** They include the coal–fields of Assam, Jammu and Kashmir, Rajasthan and Punjab.

9) Name the following:

(i) The oldest coal field in India. (ii) The largest coalfields in India. (iii) Any two states in India important for production of coal.

Ans: i) The oldest coal field in India is Talcher coalfield in Orissa.

ii) The largest coalfield in India is the Jharia coalfield.

iii) Jharkhand and West Bengal are two states important for the production of coal.

10) What are the uses of coal?

Ans: Uses of coal are as follows:

i) Coal is extensively used as domestic and industrial fuel.

ii) Coke obtained from Bituminous coal is used in the smelting of iron ore.

iii) It can be converted into other forms of energy like gas and oil. Coal is used in the generation of thermal electricity.

- By–products such as tar, ammonia benzol, sulphur, and phenol are obtained during conversion of coal to coke.
- Coal is an important raw material for various industries like chemicals, explosives, dyes, fertilizers, perfumes, plastics and paints.
- High grade coals are used in iron steel industry and steam generation.
- In India the main consumers of coal are the Indian railways, and the iron and steel industry.

11) Write a brief note on Gondwana coal.

Ans: Gondwana coal is mainly **Bituminous coal**. It is mostly moisture free, but it contains variable quantities of sulphur and phosphorous.

The Gondwana coalfields are largely located in:

i) The valley of the river Damodar, which include Jharia, Raniganj, Giridih, Bokaro & Karanpura
ii) The coal–field in the valley of river Mahanadi.
iii) The coal–fields in the valley of river Godavari.

12) What do you understand by tertiary coal fields? Name the regions of such coalfields.

Ans: The Tertiary group of coalfields account for about 2–3% of the total coal production.

- The coal found here is lignite coal, which has low carbon percentage and high percentage of moisture and sulphur.
- The tertiary coalfields are located mainly in Assam and Rajasthan. It also includes coal fields of Jammu and Kashmir and Punjab.
- The distribution of coal fields is as follows:
  - **Assam;** Makum coalfields (extending from Naga Patkai ranges (Nazira) to Lakhimpur district (Jeypore).
  - The coal is of good quality, largely used by the railways, steamer companies and the tea– factories.
  - **Rajasthan:** Pallan in southern Rajasthan and Umarsar in Gujarat have deposits of lignite coal.
  - **Tamil Nadu:** Neyveli area of south Arcot district account for 90% of the lignite of reserves. Jayamkondam of Trichy district, Mannargudi and East Veeranam account for a large part of the lignite coal output.

PREVIOUS YEARS BOARD QUESTIONS:

1) Describe in detail coal under following heads:
   a) Distribution of coal in India?
   b) Demerits of Indian coal (any two).
   c) Need of conservation of coal (two points). [2000]
2) Name two States in India where iron-ore is found on a large scale. [2005]
3) a) Name two important oil fields in India. [2005]
   b) State two main drawbacks of the coal found in India.
   c) Name the two main belts of India where oil is found.
4) a) Name two states in India where manganese is found. State one use of manganese.
   b) Name the four types of coal. Which of these is the best for industrial purposes? Justify your answer.
   c) Which country in South Asia is the large the producer of bauxite? Why bauxite is considered an important mineral? [2006]
5) a) Name the different types of iron ore found in India.
   b) Name an important coal producing State in India and a coal-mine located in that State. [2007]
6) a) Name two states with large deposits of coal. Name the coal fields in the states that you have named.
   b) What is lignite? Name one place in India where it is mined.
   c) i) Mention two uses of mineral oil.
      ii) Name an old and a new mineral oil producing area.
   d) i) Mention two reasons why minerals are important?
      ii) Name one area in Orissa and one area in Chhattisgarh where iron ore is mined. [2008]
7) a) Which state is the largest producer of mineral oil? Name any two oil refineries of India?
   b) Name any two off–share oil fields of India.
   c) i) Name the oldest and the largest coal field in India.
      ii) Name any two raw materials derived from coal.
   d) Name the different types of iron ore found in India. Which is the best quality iron ore? [2009]
8) a) Name one centre in each of the following states where iron is mined:
      i) Orissa ii) Jharkhand.
   b) Which variety of coal is popular for domestic use? Give a reason for your answer.
   c) Name a region which has natural gas deposits. Mention two uses of natural gas.
   d) Why is an oil refinery located either close to an oilfield or in a coastal city? Name one oil refinery in the private sector. [2010]
9) a) What grade of iron-ore is mostly mined in India? Name two leading iron-ore producing states.
   b) What is lignite? Name the two areas where lignite is found in India.
   c) Name the leading producer of manganese in India, Name two important industrial uses of manganese.
   d) Name the two states where limestone is found. Mention two important uses of limestone.

[2011]

10) a) i) Name two leading states producing Manganese.
ii) Name one use of the mineral.
b) i) Name two varieties of iron ore used in industry.
ii) How is the low grade iron ore utilized?
c) Give geographical reasons why:
i) Anthracite is used for domestic purposes.
ii) Oil refineries are located close to oil fields or near ports.
iii) the location of coal fields is an important factor in industrial development.
d) Name the mineral:
i) which is converted to aluminium
ii) which is used in the manufacture of cement.
iii) the largest deposits of which are found in Balaghat in Madhya Pradesh. [2012]

11) a) Name the ore of aluminium. Describe two main uses of aluminium.
b) Name any two industrial products for which limestone is used as a source of raw material.
c) i) Name two industries that use a high quantity of coal.
ii) Name one important area that has large coal deposits in the states of Jharkhand and West Bengal.
d) i) Which state is the largest producer of mineral oil?
ii) Name two coastal and two inland oil-refineries in India? [2013]

12) a) Mention any two uses of manganese.
b) Which of the different varieties of coal is used for domestic purposes and why?
c) Name the mineral used in the manufacture of:
i) Cement ii) Aluminium iii) Synthetics
d) Which State is the leading producer of the following minerals?
i) Coal ii) Oil iii) Manganese [2014]

Chapter 15: Agriculture in India

The cultivation of the soil in order to grow crops and rear livestock is known as agriculture.

Types of Agriculture in India:

Subsistence Farming:

- It is the type of agriculture in which farmers work hard to grow enough food to survive only. There remains no surplus to sell in the market. This type of farming is practiced in tribal areas of Assam, other north–eastern hilly states and in the Himalayan region.

Mixed Farming:

- It is another type of farming in which cultivation of crops and rearing of animals are done together on the same farm. Mixed farming keeps the farmers better–off and more secure, because their income comes from various sources. Rotation of crops is practiced.

Shifting Cultivation:

- It is the oldest type of agriculture. This is also as *'slash and burn'* method. In India, it is known as *Jhumming.* This method of farming is carried on in jungles of north–eastern parts of India. A patch of land is cleared for cultivation. As the yield decreases after two or three years, the patch is abandoned and a fresh clearing is made. Shifting agriculture, in India, is carried in the hill of Assam, Arunachal Pradesh, Mizoram and Nagaland.

Extensive Farming:

- It is practiced in regions where the population size is small and land is enough. Here, per acre yield is low but overall production is in surplus due to less population. Agriculture is done with the help of machines. In our country, extensive farming is practiced in the Terai region of Sub–Himalayas and in parts of North–western India.

Intensive Farming:

- In regions where the size of population is big but land is less, this type of farming is done. Annually two or three crops are grown due to the demand of food for the large size of population. Agriculture is done with the help of manual labour. Intensive farming is widespread in the irrigated areas of the Northern Plains and coastal strips of South India.

Plantation Agriculture:

- It is also a type of agriculture in which trees or bushes are planted on huge estates. A single crop like rubber, sugarcane, coffee, tea or banana is grown. These crops usually cater to the export market and earn foreign exchange. Plantation farming is carried on in some parts of India like the hills of south India and North–East states of India where tea, coffee and rubber are cultivated.

Commercial Farming:

- This system of agriculture involves cultivation of crops for sale in the market. These crops are called commercial or cash crops. They include sugarcane, tobacco, fiber crops and oilseeds.
- It is usually practiced in areas where the population is sparse and plenty of spacious land is available and market economy is well–developed.

Problems of Agriculture in India:

The problems faced by Indian agriculture are as follows:

- ♦ Soil erosion due to heavy monsoon rains, floods, gusty winds and insufficient vegetation cover have increased the infertility of the soil.
- ♦ In equal distribution of rainfall is the cause of the failure of rain –fed crops.
- ♦ Due to the illiteracy, farmers cannot use modern scientific methods of cultivation.
- ♦ An unsound credit system and the poverty of the farmer they do not have capital to invest in improvements.
- ♦ Majority of land holdings in India are very small. These small and fragmented holdings cannot promote modern agriculture.

Solution:

- ♦ Improving the health of the farmers.
- ♦ Giving them letter credit facilities, improved hybrid seeds, chemical fertilizer and educating the farmers in modern scientific methods of cultivation
- ♦ Reclaiming land and preventing fragmentation.
- ♦ Farming co–operatives, offering incentives and bonus to farmers.
- ♦ Introduced scientific farming programmes

Chapter 16: Food Crops

Crop Seasons

There are three main crop seasons in India.

- ***Kharif:*** The *Kharif* season begins with the onset of the monsoons in June–July. The crop grows in the rainy season and harvesting takes place in the beginning of November. Rice, maize, millets, groundnuts, cotton and jute are the principal crops grown in the *Kharif* season.
- ***Rabi:*** This season starts after the rainy season. Sowing begins in October–November and harvesting takes place in the beginning of summer in March–April. Rabi season is cooler and drier than the kharif season. Wheat, barley, pulses and some oil–seeds are grown in this season.
- ***Zaid:*** This is the summer season for growing crops which remain till April, May and June. The products grown in this season are mainly vegetables and fruits.

Rice:

- Rice is the staple food of millions of people in India. It is a Kharif crop. After China, India is the largest producer of rice.
- **Geographical Requirements:**
  - **Temperature:** 22°C to 32°C average 24°C.
  - **Rainfall:** 150 cm to 300 cm.
  - **Soil:** Alluvial topsoil clayey impervious subsoil

Methods of Cultivation:

- **Board-casting:** The seeds are scattered all over the field after ploughing it. It is labour saving also. This is done before the onset of monsoon.
- **Drilling method:** In this method, the seeds are dropping in a straight line at the regular intervals through a bamboo shaft attached to the plough which makes furrows. The main advantage of this method is that the seeds fall in the furrows in a systematic way. The germination rate of the seeds is high and the wastage of seeds in minimal, as well as time consuming.
- **Dibbling method:** Dibbling is the dropping of seed at regular intervals in the furrows made by the plough.
- **Transplanting Method:** Transplantation is the sowing of seeds which is usually done in well prepared seed beds call miseries, after 4 to 5 weeks when saplings attain 25 to 30 cm of height they are transplanted in to prepared rice fields, in a regular distance. Then the surplus water is drained so that by the time the grains ripen, the field is dry. It is a labourious tasks.
- **Japanese Method:** This method is very popular and best method, now a days because as it yields three times the normal quantity. It involves:
  - The use of better quality seeds of the high yielding varieties (HYV).
  - The sowing of seed in raised nursery beds.
  - Transplantation of the seedlings in equal distant rows. It is easy for applying fertilizers.
  - Irrigation also done regularly during the period of growth
  - Heavy manuring done both in the nursery and the field.

Types of Rice:

- **Upland type:** grown on terraced fields on the hill slopes at higher elevations.
- **Low land type:** grown in flat, low–lying areas.

Distribution:

- Tamil Nadu, West Bengal, Orissa, Andhra Pradesh, Bihar, Assam, Punjab, Uttar Pradesh.
-

Wheat:

- Wheat is the world's most important food crop for more then 1/3 of the world population winter but in India it ranks after rice in importance.

Geographical Requirements:

- **Temperature:** 10°C to 15°C (When growing); 20°C to 25°C (When ripening)
- **Rainfall:** 50 to 100 cm
- **Soil:** Well drained clayey, loamy or black soil and alluvial soil also

Methods of Cultivation:

- Wheat sown in October–November after the monsoon rains, when temperatures are low, the soil is moist and easily ploughed and fertilized.

- The grain appears at the end of January and harvesting is done just before the intense summer heat sets in at the beginnings of March. Plenty of sunshine is beneficial to ripening and early harvesting.

Distribution:

- Punjab and Haryana, Uttar Pradesh, Rajasthan, Madhya Pradesh.

Millets:

➢ The tern 'millets' refer to a member of inferior grains which serve as food grains for the poorer sections of the society. Jowar, Bajra, and Ragi are kharif crops. Millets are called dry crops.

Geographical Requirements:

- Temperature: 27°C to 32°C
- **Rainfall:** 50 cm to 120 cm
- **Soil:** Inferior alluvial soil or sandy soil.

Jowar, Bajra, Ragi:

♦ Jowar, Bajra and Ragi is a kharif as well as a rabi crop.

Geographical Requirements:

- Temperature: 27°C to 32°C
- **Rainfall:** 50 cm 100 cm (Ragi)
- **Soil:** Dry Soil, clayey loams are the best.

Distribution:

- Uttar Pradesh, Punjab, Haryana, Maharashtra, Gujarat, Madhya Pradesh

Pulses:

- Pulses are enlivened as kharif and as Rabi crops.

Geographical Requirements:

- **Temperature:** 20°C to 25°C
- **Rainfall:** 50 cm to 75 cm
- **Soil:** Dry light soil

Distribution:

- Punjab, Haryana, Uttar Pradesh, Maharashtra, Madhya Pradesh

Crop	Temperature	Rainfall	Soil	Methods of farming	Area and States
Rice (Kharif) Most imp. staple food crop of India	22°C to 32°C Average 24°C When ripening	150 cm to 300 cm	Alluvial topsoil, clayey impervious subsoil	Rice can be grown by broadcasting, dibbling, drilling, transplanting and Japanese method of cultivation. Transplanting method is the best	Northern Plains, Eastern Coastal plains especially the Deltas of Krishna, Kaveri, Mahanadi and Godavari. West Bengal, Uttar Pradesh, Andhra Pradesh, Punjab, Bihar, Jharkhand and Tamil Nadu are the leading rice producing states.
Wheat (Rabi) Second most imp. food crop	10°C to 20°C when growing 25°C to 25°C when ripening	50 cm to 100 cm (winter rain beneficial)	Clayey, loamy soils	It is sown by broadcasting, dibbing and drilling methods. In India, ploughing, sowing harvesting, and threshing is generally done by hands.	Uttar Pradesh, Punjab, Haryana, Madhya Pradesh, Bihar, Chhattisgarh, Rajasthan, Maharashtra, and Gujarat.
Millets: Jowar (K & R) Bajra Ragi (Kharif)	27°C to 32°C 27°C to 32°C 27°C to 32°C	20 cm to 100 cm 50 cm to 100 cm 50 cm to 100 cm	Grown on a variety of soils but clayey loams are more suitable. Any type of soil is suitable Variety of soils	Mostly by broadcasting method.	**Jowar and Bajra:** Maharashtra Karnataka, Andhra Pradesh, Madhya Pradesh, Jharkhand, Tamil Nadu, Uttar Pradesh, Gujarat, and Rajasthan. **Ragi:** Karnataka, Tamil Nadu, and Andhra Pradesh.
Pulses Gram (Rabi) Arhar, and Moong	20°C to 25°C	50 cm to 75 cm	Dry light soils	Dibbling method.	**Gram:** Punjab, Haryana, Uttar Pradesh, Bihar. **Moong, Arhar**: Andhra Pradesh Maharashtra, and

(Kharif) Masur (Rabi and kharif both)					Bihar. **Masur:** Madhya Pradesh, Tamil Nadu, and Uttar Pradesh.

QUESTIONS AND ANSWERS

Short Answers: [2 Marks]

1) What is meant by the term Agriculture?

Ans: Agriculture can be defined as the cultivation of the soil in order to grow crops and rear livestock.

2) What is meant by monoculture?

Ans: Monoculture or single crop plantation, only one crop is grown in the whole plantation.

i) It is more common in tropical countries because there is no fear of frost
ii) Tea and rubber plantations in India are its examples.

3) What is known as the zaid season?

Ans: i) Besides Rabi and Kharif crops, the farmers also grow an extra – crop, known as 'zaid'.
ii) It is grown in the summer months of April May and June, just after the rabi crops are harvested.
iii) Its main products are seasonal fruits and vegetables.

4) What are the advantages of commercial farming?

Ans: i) In this type of farming mechanised agriculture is practiced and farmers grow crops for the market.
ii) Maximum yield is produced with the help of irrigation, fertilizers, and scientific methods of farming and use of hybrid seeds.
iii) This kind of farming is generally practiced in areas of sparse population, where the spacious land is available for large farms and market economy has taken its roots.

5) What are food crops? Why is it necessary to establish industrial processing units for food crops?

Ans: i) Since India has to feed a large population, preponderance of food crops over other crops is the most important feature of Indian agriculture. More than 2/3rd of the total cropped area is taken up by the cultivation of food crops like rice, wheat, maize, millets.
ii) In order to establish a good foreign exchange from food crops that are surplus, specially after the Green Revolution, food must be well processed in industrial units so that they can be preserved and stored.

6) What are Rabi and kharif crops?

Ans: ***Rabi:*** This season starts after the rainy season. Sowing begins in October–November and harvesting takes place in the beginning of summer in March–April. Rabi season is cooler and drier than the kharif season. Wheat, barley, pulses and some oil–seeds are grown in this season.

Kharif: The *Kharif* season begins with the onset of the monsoons in June–July. The crop grows in the rainy season and harvesting takes place in the beginning of November. Rice, maize, millets, groundnuts, cotton and jute are the principal crops grown in the *Kharif* season.

7) Why are the leguminous crops an important component of any cropping system?

Ans: The leguminous crops are important component because it is helpful to maintain fertility of soil by nitrogen supply. Thus rotation of this crop reduces fertilizer needs.

8) Give Reasons: Drilling is the best method of sowing of seeds

Ans: i) In the drilling method, the seeds are dropped in a straight line at regular intervals through a bamboo shaft attached to the plough which makes furrows.
ii) This method requires more labour and time but is economical in the use of seed. Therefore, drilling is considered to be the best method of sowing of seeds.

9) Give Reasons: Jhumming is forbidden.

Ans: i) This method of farming is not an environment friendly method as it involves in deforestation and burning increases the level of greenhouse gases.
ii) Moreover, the method is wasteful and yield per hectare is also low. Hence, Jhumming is forbidden.

10) i) Why are millets widely grown?

Ans: a) Millets are used widely used as animal fodder and bird seed.

b) It does not require any extra effort to grow and can grow well even in high temperatures like in drought conditions. Moreover, it gives an enough yield.

Hence, millets are widely grown.

ii) What is the common feature of all millets?

Ans: The common feature of all millets is that they belong to the grass family.

11) Why is the area under the cultivation of wheat on the increase?

Ans: i) The use of package technology or the Green Revolution in India in late sixties has helped high yielding varieties of wheat which are drought – resistant and also able to survive wide fluctuations in rainfall.

ii) Use of chemical fertilizers, irrigation, machinery crop protection measures, and institutional support also helped in the increase of wheat production.

12) In which type of soils, rice can be grown best?

Ans: Rice can be grown in a variety of soils but alluvial soil with subsoil of impervious clay is ideal of its cultivation. The impervious subsoil does not allow water to drain away and retains the water to stagnate in the fields.

13) What are the advantages of transplantation method of sowing rice?

Ans: i) Use of transplantation method increases the yield of rice crops compared to other methods.

ii) In this method, the problem of weeding is reduced because at the time of puddling, weeds get buried.

14) What are the soil and climatic conditions suitable for the cultivation of grams?

Ans: **Soil:** Gram can be cultivated in comparatively less fertile alluvial soils. Deep medium black soil is ideal for its growth.

Temperature and rainfall: Gram is a rabi crop which requires temperatures between 20°C to 25°C during its growth. It is generally grown as a dry crop in areas having moderate rainfall between 50 cm and 75 cm.

15) How are pulses harvested?

Ans: The pulse crops mature in about 150 days or about five months. When leaves of plants become dry and begin to shed, these plants are pulled out. They are dried for a few days. Then they are thrashed by trampling under the feet of bullocks or with sticks to get the seeds.

16) Where is intensive commercial farming done in India?

Ans: Intensive farming is widespread in the irrigated areas of the Northern Plains and the coastal strips of South India.

Short Answers: [3 Marks]

17) Why is agriculture said to be the backbone of the Indian economy?

Ans: i) Agriculture not only provides food to human beings but also fodder.

ii) It is also the source of raw material for many key industries e.g. sugar, textile and edible oil.

iii) It provides a large part of the market for industrial goods, especially the farm inputs like fertilizers, pesticides, implements, machinery etc.

iv) It accounts for a substantial portion of India's exports.

Hence, agriculture said to be the backbone of the Indian economy

18) State two problems faced by Indian agriculture.

Ans: The following problems are faced by the Indian agriculture:

i) More than 60% of the cultivated land depends on the vagaries of the monsoon rainfall, Un reliable, seasonal and unequal distribution of rainfall is the cause of the failure of rain fed crops. There are inadequate irrigational facilities in such areas.

ii) Soil erosion due to heavy monsoon rains, floods, gusty winds and insufficient vegetation cover have increased the infertility of the soil and reduced the yields per hectare.

iii) Due to the illiteracy the farmers are reluctant to use modern scientific method of cultivation. Many of them do not use new and better quality seeds, fertilizers and pesticides to ensure good quality crops.

iv) Due to small uneconomic holdings due to farm fragmentation, half of the farms in India are less than 1 hectare in size and 4 percent are of 10 hectares. They cannot use tractors or agricultural machines on these small holdings.

v) Farmers are disinterested in improving the land or taking the risk of trying new methods of cultivation or new varieties of seeds.

vi) The system of land tenure is such that most of the farmers do not own the land cultivated by them. They belong to absentee landlords who are indifferent to land improvements.

vii) An unsound credit system and the poverty of the farmers are serious problems. They often suffer the burden of heavy inherited debts. They do not have capital to invest in improvements.

viii) Indian agriculture is mainly of subsistence type. About 72% of the total area is devoted to food crop to meet the requirements of the country. There is no surplus to export.

xi) Average productivity of crops is low due to outdated farming practices, less use of manures and pesticides and low quality seeds.

19) In which region is Ragi grown in Indian? Why?

Ans: Ragi is mainly grown in Peninsular India, in the southern states of Karnataka, Tamil Nadu and Andhra Pradesh.

- It is both a kharif and a rabi crop.
- Ragi grows in areas of less rainfall. It is grown either with dry–farming method or as an irrigated crop.
- It grows on a variety of soils of Peninsular India.

20) With reference to jhumming, answer the following question:

i) How is jhumming carried out?

Ans: In this type of farming there is continuous shifting from one clearing in the forest to the other due to loss of soil fertility.

ii) Where is it practiced in India?

Ans: It is practiced in the North east hill states, Madhya Pradesh, Chhattisgarh, Jharkhand.

iii)What are its disadvantages?

Ans: It is not an environment – friendly method as it involves deforestation and burning increases the level of greenhouse gases. It is a health hazard and produces low crop yield.

21) With reference to the types of farming in India, answer the following question:

i) Give the meaning of the term plantation farming.

Ans: Plantations are large tracts of land used for cultivation of a single agricultural crop like tea, coffee, rubber or spices on a large scale.

ii) Who introduced plantation farming to India?

Ans: The European colonists introduced plantation farming to India.

iii)What are the advantages of this type of farming?

Ans: i) The plantations usually cater to the export – market and earn foreign exchange

ii) It involves large number of labourers like managerial labour, daily wage labourers; hence it provides employment opportunities to a large section of the population.

22) Differentiate between the following:

Ans: **Subsistence farming and Commercial farming.**

Subsistence farming	Commercial farming
Subsistence farming is practiced in the densely populated regions of the world for the sole purpose of the farmer's subsistence. There is no surplus left for sale.	This kind of farming is practiced for the sale of the crops in the market. Generally practiced in areas of sparse population where holdings are large.
Farms are small and scattered and the yields are not large.	Farms are large and yield is very high.
This kind of farming may be intensive primitive. There is little use of modern tools and implements.	This kind of farming may be intensive or extensive. Latest knowledge and modern methods of agriculture are used.

23) Intensive farming and Extensive farming.

Ans:

Intensive farming	Extensive farming
In this type of farming, farmers raise more than one crop from the same field by making use of irrigation facilities.	In this type of farming, the farmer specializes in a couple of major commercial crops with the help of machines.
The land is limited, so the farmer uses it intensively in order to have the maximum output.	The farms are huge, so no extra care is needed to maintain the soil–fertility.
Intensive labour, rich manure and fertilizers, quality seeds and water supply through irrigation are used to maintain the high yield	Mechanisation in farming is a unique feature with the absence of human and animal labour. There are bumper crops.
Intensive farming is widespread in the irrigated areas of the Northern Plains and the coastal strips of South India. Rice and wheat are main crops.	Extensive farming is practiced in the Terai region of the Sub–Himalayas and in parts of North Western India. Wheat, rice, sugarcane are the main crops.

24) i) What is meant by fallow land?

Ans: **Fallow land:** The much used land is often allowed to rest or lie fallow for period of time. This piece of land is called fallow land.

ii) State one advantage and one disadvantage of leaving land fallow, so that the natural forces could act on the soil.

Ans: **Advantage of fallow land:** The decayed natural vegetative matters helps to increase the plant nutrition in the soil.

Disadvantage: The marginal farmers can't afford to get more production by leaving the land to rest.

25) Why is agriculture called the mainstay of the Indian economy?

Ans: i) Agriculture is the main stay of Indian economy. Between 67% of our population depends directly or indirectly on agriculture.

ii) It provides raw material to the industries.

iii) India earns foreign exchange by exporting agriculture products.

iv) It contributes 30% to the national income.

26) What is mixed farming? Mention advantages of this farming to the small farmers.

Ans: Mixed farming is a system of farming on a particular farm to sustain and satisfy the essential needs of the farmers. It includes rearing of livestock and poultry, fish and bee keeping.

Advantages:

i) The small and marginal farmers in rainfed regions cannot take the risk of growing specialized crop.

ii) In this farming equal importance is given animal rearing.

iii) Farmer remains busy in their work throughout the year. It supplements the farmer's earning in the lean season.

27) Differentiate between Rabi, Kharif and Zaid crops. Give an example of each.

Ans:

Rabi crops	Kharif crops	Zaid crops
Winter crop	Summer crop	Extra crop
Rabi crops are sown in the winter season (October–November) and harvested in the beginning of summer (March–April).	They are sown at the beginning of the rainy season in June and harvested in the autumn season in the beginning of November.	It is grown in the summer months of April, May and June after the rabi season.
The main crops are wheat, barley, gram, linseed, tobacco and mustard.	The principal kharif crops are rice, maize, millets, cotton, jute, castor, groundnut and sesamum.	Its main products are seasonal fruits and vegetables.

28) Why is wheat growing important in Punjab?

Ans: Although Punjab is not the biggest producer or wheat in India, yet wheat is the most important crop of Punjab. The favourable factors are as follows:

i) It is region of alluvial soil deposited by the rivers of Punjab

ii) Punjab has ideal climatic conditions for growing wheat.

iii) Water requirements are supplemented by network of irrigation canals, which are fed by Bhakra Nangal Project, Harike project and Beas project.

iv) Rain from Western Disturbances is a boon for wheat crop in Punjab.

v) The Punjab's farmers are very laborious. Large holdings and improved techniques are favourable for wheat growing.

29) Give two reasons why the growing of pulses is important in India.

Ans: **Owing to following reasons the growing of pulses is important in India:**

i) Pulses include a very important part of the Indian–diet particularly for the vegetarian population because of protein content of the pulses.

ii) They are leguminous plants. They help in restoring the soil fertility, so they are used as rotating crop.

iii) They are dry crops and required less water.

iv) They serve as excellent fodder for cattle.

a) The geographical conditions in Punjab are most suitable for growing wheat.

Ans: **Punjab experiences following climatic conditions:**

i) Punjab receives winter rain due to western disturbances which is beneficial to the wheat crop.

ii) The draining of perennial rivers makes the soil clayey, loamy, and well drained helping the wheat crop to grow well.

iii) In winters, the state experiences 10° to 15° C of temperature which favours the wheat crop in ripening. Even in the mid-March, April-mid the temperature ranges 20°C to 25°C which again is ideal for wheat cultivation.

b) Millets and pulses are called 'Dry Crops'.

Ans: i) These crops mature early and are drought resistant crops.

ii) They are and therefore cultivated in the drier parts of monsoon lands, particularly the Deccan Plateau.

iii) Hence they are called as 'Dry Crops'.

c) Which is a useful 'rotation crop'? Why?

Ans: i) Pulses form an important part of the Indian diet and are grown in the Rabi season. Pulses include a number of crops (dals) which provide protein. They are leguminous plants with root nodules which have the capacity to fix and use atmospheric nitrogen in the soil. They utilize nitrogen from air.

ii) The crops are rotated with other crops to maintain or restore soil fertility. They act as fertilizer to the soil.

iii) Pulses serve as an excellent forage (food for cattle) and grain concentration in the feed of cattle. It also supplies protein in a vegetarian diet as there is an absence of animal protein in a vegetarian diet.

f) Rice is not the main crop in the Deccan Plateau.

Ans: Rice is not the main crop in the Deccan Plateau due to the following reasons:

i) Rice grows best in heavy loam and alluvial soil with sub–soil of impervious clay which allows water to stagnate in the fields. Deccan plateau has mainly black cotton soil or red soil, which are not suitable for growing rice.

ii) Rice needs warm or hot humid climate, with temperature between 18°C to 35°C. Deccan plateau has a hot dry climate with little moisture in the air and temperature above 30–35°C.

iii) Rice needs abundant rainfall ranging between 150 cm–300 cm. It requires 5–10 in of standing water during the early part of the growing season.

The Deccan Plateau region receives an average of 50–100 of rainfall, which is inadequate for growing rice. Irrigation facilities are also not widely available.

Due to the terrain, vast tracts of flat land are not available for water to stand in the fields. Hence rice cannot be widely grown on the Deccan Plateau.

30) Give three main aspects of the Japanese method of rice cultivation.

Ans: The three aspects of the Japanese method of rice cultivation are:

i) Use of high yielding paddy hybrids called JAPONICA, which increases output tremendously.

ii) Sowing of seeds in raised nursery beds.

iii) Transplantation of seedlings in rows. This facilitates weeding and fertilizing.

iv) Irrigation is done to ensure the required supply of water during the period of growth.

v) Heavy manuring done both in the nursery and the field.

31) For wheat in Punjab:

i) Give two natural factors and one man–made factor that favour the cultivation of wheat.

Ans: The two factors favouring the cultivation of wheat are as follows:

i) The winter rain due to western disturbances received in Punjab helps the wheat crop for speedy germination.

ii) The state has clayey, loamy and well drained soils owing to the flow of various river channels.

iii) The man–made factor, favouring the cultivation of wheat includes introduction of Green Revolution in 1967–68. The high–yielding Mexican wheat and hybrids led to the maximum **yield in acreage.**

32) Why millets are called "dry crops"? Why is bajra grown in Rajasthan and jowar in Maharashtra?

Ans: i) Millets are called "dry crops". This is common name for several species of the grass family. They can be grown on lands which are not suitable for rice and wheat production because of deficient rainfall and poor soil. They can be grown in areas of high temperature ranging from 27°C to 32°C. They can survive in high heat and drought conditions, in rainfall from 50 to 120 cms and in medium to deep black soils. They are grown in the drier parts.

ii) There are three types of millets in India – jowar, bajra and ragi.

Jowar is grown in Maharashtra as they can be grown in deep black soils. They take only three months to mature, whereas other crops take five months. Sowing is done by the broadcasting method. After harvest, the stalks are used as cattle fodder, and the grain is used as food.

iii) Bajra can be grown in arid conditions with less rainfall, it grows on sandy soil as in Rajasthan. The sowing is done in the middle of June and harvested in November. When the harvest is ready, the heads with grain are cut by hand. The plant is given for cattle fodder and grain from the heads is separated by threshing, on boards or floors.

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33) Compare and contrast the geographical conditions required for the growth of the staple food crops of India.

Ans: Two staple food crops of India are wheat and rice.

i) Wheat is sown in winter (rabi), whereas rice is sown in summer (Kharif).

ii) Wheat requires cool and moderate climate, whereas rice requires hot and humid climate.

iii) Wheat requires less than 18°C temperature and medium rainfall of 50 cm to 100 cm, whereas rice requires a temperature from 25°C to 30°C and rainfall more than 100 cm.

34) Mention the climatic conditions required for rice cultivation in India

Ans: Rice is a crop of hot and wet regions in the tropics.

Temperature: Rice plant requires temperatures ranging between 16°C and 20°C during the growing season and 18°C to 32°C during the harvesting season. It requires plenty of water and bright sunshine.

Rainfall: Rice plant requires good rainfall ranging between 100 cm and 200 cm. it requires flooded fields at the time of early growth and during transplantation.

Frequent showers before ripening helps in increasing the size of the grain. Rice can be grown in areas with less rainfall, if the facility of irrigation is available.

35) With reference to wheat: a) During which part of the year is it grown in India and why?

Ans: Wheat is grown in the winter in India because it requires cool and moist weather with a temperature of less than 20°C during its growth. Warm and dry climate is good for its ripening. It also requires 200 frost free days.

b) Why is it not grown in the southern and eastern parts of India?

Ans: Wheat is a Rabi crop in India. It grows in areas where the temperature does not rise beyond 20°C in winter during growing period.

Hence, wheat cannot be cultivated in the eastern and southern parts of India.

36) With reference to the type of soil only, state why

a) Bajra is grown in Rajasthan?

Ans: Bajra is grown in Rajasthan because it needs sandy soil and dry climate.

b) Jowar is grown in Maharashtra.

Ans: The Deccan plateau in Maharashtra has drier black soil hence Jowar is grown here.

c) Ragi is grown in Tamil Nadu.

Ans: It is grown in Tamil Nadu since it requires less rainfall and can be either grown with the dry farming or as an irrigated crop. Ragi can grow on a variety of dry soils.

37) State the differences between cultivation of upland rice and low – land rice.

Ans:

Upland Rice	Lowland Rice

This type of rice is grown in terraced field on hill slopes.	This type of rice is grown in flat low lying areas.
It is cultivated without irrigation.	It needs a lot of irrigation.
It is grown in March – April and harvested in September – October.	It is sown in June and harvested in October and November
This crop is used for local consumption.	Most of the rice grown in India is low land variety.

38) Distinguish between transplantation method and Japanese method of rice farming.

Ans: Transplantation Method and the Japanese Method of Rice Farming:

Transplantation Method	Japanese Method
In transplantation method of rice farming, first the seeds are sown in small and well prepared plots.	In Japanese method of rice farming, first the seeds are sown in already enriched and well–drained nursery beds.
About 15 cm high saplings are transplanted at regular intervals in other fields.	About 15 cm to 20 cm high saplings are transplanted in rows in another field.
Harvesting is carried out when ears are nearly ripe.	Top–dressing with nitrogenous fertilizers is done before flowering of the plants.

39) What improved methods of cultivation can raise rice production in India?

Ans: **Japanese Method:** A popular method known as the Japanese method of rice cultivation is being popularized in India in order to increase the productivity of rice.

In this method

a) The good quality seeds are sown in well-drained nursery beds already enriched with manure. The sapplings are then uprooted when they grow to 15 to 20 cm in height and replanted in rows in another field.

b) Huge amount of compost manure is used in the field before transplanting. If the green manure is used, the mixture of ammonium-sulphate and superphosphate fertilizers are used. The mixture is used again after one month of transplanting.

c) Planting is done in rows at appropriate distance and then irrigation is provided as needed. Before flowering of the rice plants, top-dressing is done with nitrogenous fertilizers.

40) State the advantages of growing rice in nurseries. Explain the method.

Ans: **Transplanting Method:**

a) In this method, first the seedlings are sown in small, carefully, prepared plots. When the plants are about 15 cm high, they are uprooted by hand in small bunches. Then they are transplanted at regular intervals in fields.

b) The fields, as the seedlings grow, are watered well. The water is supplied abundantly till the plants become mature; but about two weeks before harvesting, the water in the field is drained off.

c) Harvesting is done when ears are nearly ripe. This method, though labour intensive, gives better yields.

41) In West Bengal which three crops of rice are grown in a year? Explain.

Ans: The three crops of rice grown in West Bengal are as follows:

i) Aus (autumn) crop is sown in May-June and harvested in September-October.

ii) Aman (winter) is sown in June-July and harvested in November-December. This crop accounts for 85% of the rice produced in West Bengal.

iii) Boro (summer) is sown in November-December and harvested in March-April. This crop is grown in low-lying marshy land of poor quality.

42) Why yield of rice is very low in India as compared to other countries of the world?

Ans: Currently, the average yield of rice per hectare is 1756 kg. It is the lowest in the world. The per hectare yield of rice in Japan, China and Korea is about three times that of India. This is because:

i) Rainfall in India is uncertain and is concentrated to four months.

ii) There is a lack of assured water supply through irrigation in rice growing areas.

iii) General fertility of Indian soils is less because these have been cultivated from the last 5000 years.

iv) Farmers do not use efficient methods of cultivation.

v) Holdings are very small.

vi) Widespread poverty in the rural areas prohibits the use of adequate amount of fertilizers, pesticides, etc.

43) Discuss briefly different methods of rice cultivation.

Ans: Rice can be sown in the following five ways:

i) **Broadcasting:** It is simply scattering or throwing seeds over the soil by hand. This method is practised in areas where labour is scarce and soil is not much fertile.

ii) **Dibbling:** In this method, seeds are dropped at regular intervals in ploughed furrows. This method of rice sowing is used in Northern Plains of India.

iii) **Drilling:** In this method, seeds are dropped through shafts of bamboo which is attached to the plough. In this way, seeds fall in straight line. Now-a- days, drilling machines are used in place of bamboo.

iv) **Transplantation:** In this method, first seeds are sown in the nurseries. When they become 15 cm to 20 cm tall after about four weeks of time, they are uprooted and planted again in the flooded fields. This transplantation is done mainly by human labour.

v) Japanese method:

a) In India, the Japanese method of rice cultivation is becoming popular because this method gives three times higher yield of rice than any other method.

b) In this method, better quality seeds are used.

c) Seeds are sown in raised nursery beds.

d) Transplanting is done in rows at regular intervals. This helps in weeding and fertilising.

e) In this method, abundant application of fertilizers is done at proper stage of the growth of the crop.

44) What is the importance of agriculture in India?

Ans: i) Agriculture provides raw materials for agro–based industries such as raw cotton for cotton textiles Jute, Sugar, tobacco are also important agro –industries. These provide employment to many and help to develop the rural area as well.

ii) Commodities such as tea, cotton and jute textiles, tobacco, cashew nuts, oilseeds and spices are exported to industrialized countries and consequently are great foreign exchange earners.

iii) Agriculture products, being a source of income, prevent an unnecessary shift of population from rural to urban areas.

iv) Indian agriculture has two outstanding features i.e. wide variety of tropical and temperate crops are grown.

v) Intensive and extensive cultivation both are practiced but the former is more important. In this way, the importance of agriculture to India can be assessed.