8 FOREST : OUR LIFELINE

INTRODUCTION

Dictionary meaning of term forest is: **"A Dense Growth of Trees".** Word forest is derived from **Latin** word which means **"Unfenced wood land".** Forest is a **"dynamic living entity" "full of life and vitality".** A forest is a large uncultivated land area densly covered with various types of trees, shrubs and herbs. It also has many types of tall grasses, canes, creepers and climbers.

Forests are an important renewable natural resource. Forest ecosytem is dominated by trees, their species content varying in different parts of world. Forest contribute sustantially to the economic development of our country and they play an important role in enhancing the quality of environments by influencing the life support sytem. Forests cover about 20.55 percent of the total geographical area of India. They vary from the evergreen tropical reainforests and subtropical forests to dry alpines.

DESCRIPTION OF A FOREST

- **Crown:** Branchy part of a tree above the stem is known as crown. These crowns are of different types, sizes and create several horizontal layers in the forests.
- **Canopy:** It is the topmost layer of crown of leaves and branches of very tall trees. When viewed from above, the canopy appears as a green cover forming a roof of umbrella over the forest and land.
- **Understories:** Area of forest which grows in shade of canopy is known as understory. It include shrubs, herbs and tall grasses. The lowest layer is formed by herbs.
- **Forest floor:** It is the ground surface of the forest. It is formed of soil and remains covered with dead and decaying leaves, fruits, seeds, twigs, small herbs, fungi etc. Therefore, the forest floor appears dark and rich in nutrients.
- **Microorganisms** obtain their food from the dead and decaying matter and convert it into a dark-coloured **humus**. The microorganisms which convert the dead plants and animals to humus are called **decomposers**. Microorganisms help in cycling of nutrients and their return to the soil.

TYPES OF PLANTS IN THE FOREST

There are three types of plants in forest. They are

(i) **Annuals:** Those plants which have one year life span. There stem is soft. Eg. herbs.

(ii) **Biennials:** Those plant which have two year life span. Eg. Wheat.

(iii) **Perennials:** Those plant which have several years of life span. Eg. Shrubs and trees.

IMPORTANCE OF FOREST IN NATURE:

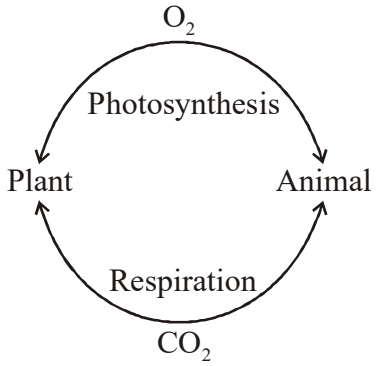
(i) Forests are called **Nature's lungs** because green plants release oxygen during photosynthesis. This oxygen is used by animals. Forest maintain balance of oxygen and carbon dioxide in the atmosphere. If forest get depleted, the ratio of oxygen and carbondioxide will get disturbed and will cause a threat of life.

(ii) Forests regulate climate by reducing temperature and help in rainfall.

(iii) Forest help in **reducing pollution** and **global warming**.
(iv) Forest control and prevent flood by holding water and not allowing its free flow.
(v) Forest control **soil erosion.**
(vi) Many medicinal plants like neen, **cinchona (source of quinine)** are found in forest.
(vii) Forest is source of food. It provides us food & fodder, fuel, fibre, fertilizer and furniture.
(viii) Forests also provide rubber, gum, resin, nonedible oils, honey, bee wax, lac, bamboos, etc.
(ix) Some ancient Tribes live in forest.
(x) Forest serve as habitat for wildlife also helps in balancing the atmosphere.
(xi) **Maintain the supply of nutrients :** Forests which harbour producers, herbivores, carnivores and decomposers are a **dynamic living entity**, full of diverse forms of life and interactions among them.
(xii) **Serve as a source of tourism and recreation :** A lot of people are attracted to forests for hiking, camping, research and various other outdoor activities.

COMPONENT OF FOREST

(A) Producers — Green plants or Autotrophs produce food by photosynthesis. All animals depend on plants. Plants also maintain oxygen and carbon dioxide ratio in the atmosphere.



(B) Consumers — Heterotrophic that can't make their own food. On the basis of Food habit they are three types:
- Herbivores
- Carnivores
- Omnivores

(C) Decomposers:
(i) The Microorganisms like bacteria and fungi that convert dead and decaying animals and plants into humus are called **decomposers.** They ensure that the nutrients of dead plants and animals and rotten leaves are released into the soil because of that the top most layer of soil is most suitable layer for plant growth.
(ii) The leaves, flowers, fruits, etc are converted into **humus** by decomposers on coming in contact with water, humus release nutrients into the soil. These nutrients make the **soil fertile.**

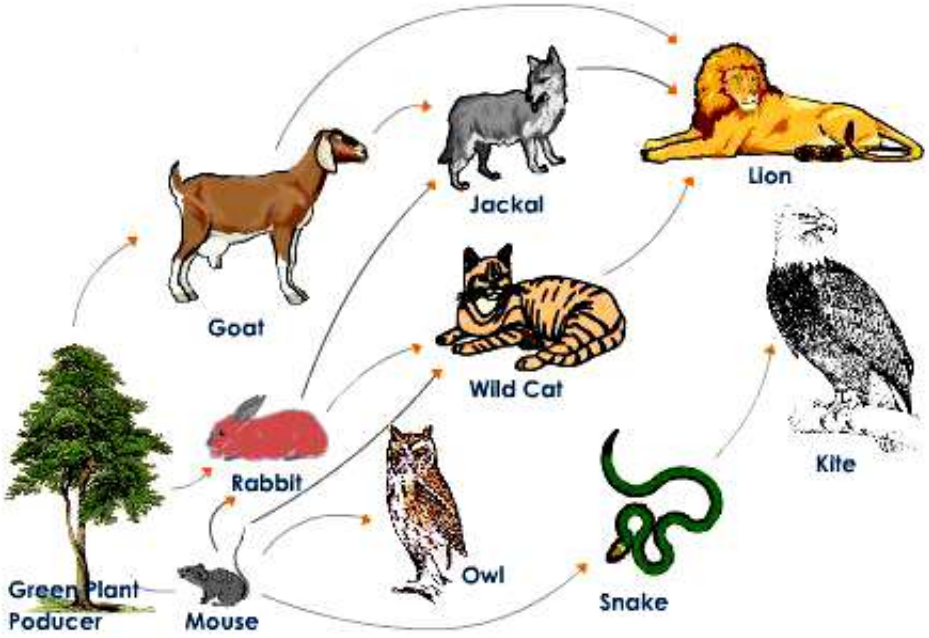
FOOD CHAIN

Sequence of animal eating one another is called **food chain.**

Grass → Insect → Frog → Snake → Eagle

FOOD WEB

Many food chain interconnected with each other than it is called **food web.**



Food Web in a Forest

ECOSYSTEM

It is the structural & functional cordinated unit of Environment which **include Biotic & Abiotic factors.** This term given by **A.G. Tansley.**

INTERDEPENDENCE OF PLANTS AND ANIMALS IN FOREST

(i) Animals obtain food from plants.
(ii) Animals obtain oxygen from plants.
(iii) Animals get shade and protection from sun and rain.
(iv) Plants purify air. Also by holding soil particles together, they decrease the dust contamination of air. These particles form **suspended particulate matter (SPM)** in the atmosphere.
(v) Plants depend on animals for carbondioxide.
(vi) Plants depend on animals for pollination and seed dispersal.
(vii) Plants obtain nutrients from dead & decaying animals. Decomposer destroy the dead bodies of animals and convert it in to inorganic compounds which percolated into the soil and provide it for plants. This is called **recycling of Nutrients.**

DESTRUCTION OF FORESTS

Deforestation and Pollution are two major threats to the forests. The forest cover of India and even of the world is reducing at a fast pace due to human activities. Cutting down forests for short term benefits is deforestation. The causes of deforestation are :

(i) Increased demand of fuel wood, paper and timber.
(ii) Increased demand of land for industries, houses, roads, agriculture and railway tracks.
(iii) Increased mining activity.
(iv) Lowering of water table causes plants and trees to wilt and die.

CONSEQUENCES OF DEFORESTATION

Increase in the overall temperature of the earth or global warming, lesser rain causing desertification, increased soil erosion, inbalanced ecosystem, danger to wildlife, loss of biodiversity.

POLLUTION

Pollution of water changes the quality of water which damage the roots of trees. Higher level of suspended matter affects the functioning of leaves by closing their stomata. Fire is also responsible for the destruction of forests on a large scale.

FOREST CONSERVATION AND MANAGEMENT

Large scale felling or cutting of the forest trees must be stopped. Overgrazing by cattle and other animals should be stopped. Forests must be protected from insects pests and infections by treating them with insecticides and pesticides. Forest fires must be checked. People should avoid smoking or cooking in the forest area. Various activities leading to soil erosion must be avoided.

Indian Government introduced social **forestry** in 1970 in which waste lands are used to grow trees. **Chipko movement** was started in **1974** by sunderlal Bahuguna to reduce free felling.

AFFORESTATION

Top priority is to be given to forestry. Forest occupy central position in nature. They restore ecological balance of all ecosystems, maintain bio diversity, act as catchment for soil and water conservation, preventing floods etc.

In order to meet such needs, we need to develope massive afforestation programmes of indigenous and exotic fast growing species for production and protection forestry on suitable land including neasteland.

In crux we can say that the practice of planting trees to save environment from the bad effects of **deforestation (cutting of trees).**

CONCEPT APPLICATION LEVEL - I [NCERT Questions]

Q.1 Explain how animals dwelling in the forest help it grow and regenerate.

Ans. We can see a bunch of seedlings sprouting in a decaying heap of animal droppings especially in rainy seasons. These seedlings are the herbs and shrubs. The animals also disperse the seeds of certain plants and help the forest to grow and regenerate. The decaying animal dung also provides nutrients to the seedlings to grow.

Q.2 Explain how forests prevent floods.

Ans. Raindrops in a forest do not hit the ground directly. The uppennost layer of the forest canopy intercept the raindrops, and most of the water comes down up to soil through the branches and the stems of the trees. From the leaves it drops slowly over the branches of the shrubs and herbs. Thus forests act as a natural absorber of rainwater and allows it to seep and therefore help in controlling floods.

Q.3 What are decomposers? Name any two of them. What do they do in the forest?

Ans. **Decomposers:** The micro-organisms which convert the dead plants and animals to a dark-coloured substance i.e., humus are known as decomposers.

Example: Tiny insects, millipedes, ants, beetle, etc. Decomposers feed upon the dead plant and animal tissues and convert them into a dark-coloured substance called humus.

Q.4 Explain the role of forest in maintaining the balance between oxygen and carbon dioxide in the atmosphere.

Ans. Plants release oxygen as a byproduct during the process of photosynthesis. This oxygen is inhaled by animals for respiration. This respiration process releases carbon dioxide which is used again by plants during photosynthesis. In this way, use and consumption of oxygen and carbon dioxide goes on. Thus, they maintain the balance of oxygen and carbon dioxide in the atmosphere.

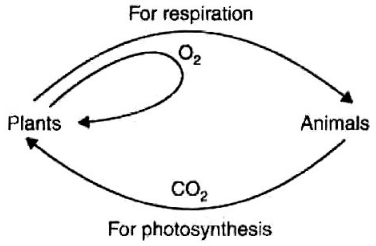


Fig. Balance of oxygen and carbon dioxide

Q.5 Explain why there is no waste in a forest?

Ans. The dead animals become food for scavangers like vultures, crows, jackals and insects. Moreover, remains of these animals and of plants along with the droppings of animals are converted to humus by decomposers. So nothing goes waste in a forest.

Q.6 List five products we get from forests.

Ans. (i) Honey (ii) Wax (iii) Gum (iv) Herbs (v) Wood.

Q.7 Fill in the blanks:

(a) The insects, butterflies, honeybees and birds help flowering plants in _____ .

(b) A forest is a purifier of _____ and _____ .

(c) Herbs form the _____ layer in the forest.

(d) The decaying leaves and animal dropping in a forest enrich the _____ .

Ans. (a) pollination (b) air, water (c) lowest (d) soil

Q.8 Why should we worry about the conditions and issues related to forests far from us?

Ans. We should worry about the conditions and issues related to forests even far from us because forests play an important role for the sustenancc of life on earth. The following points illustrate the importance of forests for us:

(i) Forests help in maintaining the ratio of oxygen and carbon dioxide in air.

(ii) Forest provide habitat to a wide variety of plants and animals.

(iii) Forests provide firewood, timber, medicines, fruits, rubber, gum, resins, honey, bee-wax, lac and many other products.

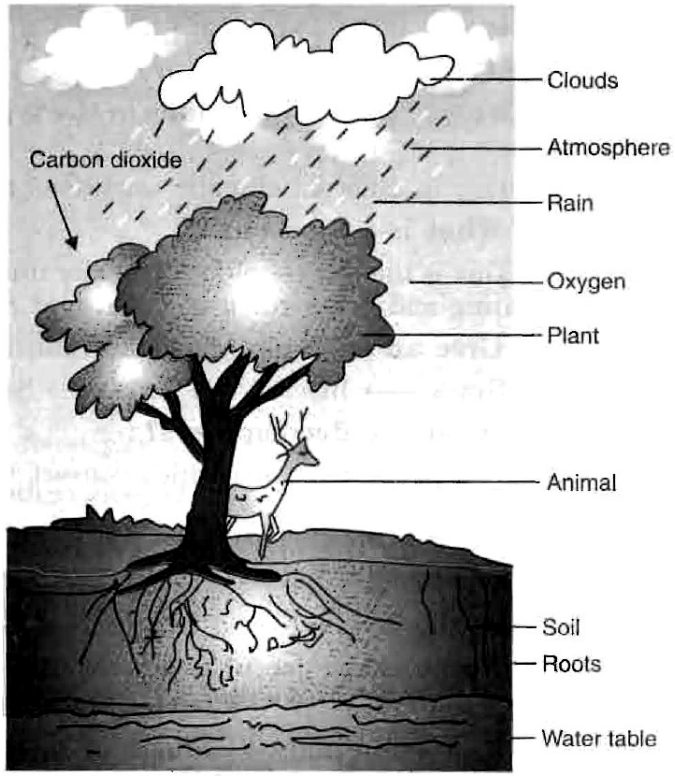
(iv) Forests reduce the speed of flowing water and help in controlling floods.

Q.9 Explain why there is a need of variety of animals and plants in a forest.

Ans. By harbouring greater variety of plants, the forest provides greater opportunities for food and habitat for the herbivores. Larger number of herbivores means increased availability of food for a variety of carnivores. The wide variety of animais help the forest to regenerate and grow.

Q.10 In Fig., the artist has forgotten to put the labels and directions on the arrows. Mark the directions on the arrows and label the diagram using the following labels: clouds, rain, atmosphere, carbon dioxide. oxygen, plants, animals, soil, roots, waler table.

Ans.



Q.11 Which of the following is not a forest product?

(i) Gum (ii) Plywood (iii) Sealing wax (iv) Kerosene

Ans. (iv) Kerosene.

Q.12 Which of the following statements is not correct?

(i) Forests protect the soil from erosion.

(ii) Plants and animals in a forest are not dependent on one another.

(iii) Forests influence the climate and water cycle.

(iv) Soil helps forests to grow and regenerate.

Ans. (ii) Plants and animals in a forest are not dependent on one another.

Q.13 Microorganisms act upon the dead plants to produce

(i) sand (ii) mushrooms (iii) humus (iv) wood

Ans. (iii) Humus.

CONCEPT APPLICATION LEVEL - II

Section – A

Q.1 What is canopy?

Ans. The branches of the tall trees form a shady look, like a roof over the other plants in the forest. This is called a canopy.

Q.2 Why is there a variations in the types of trees and other plants in different forests?

Ans. Due to different climatic conditions of the forest.

Q.3 What is a food chain?

Ans. This is the process of food transfer from plants through a series of organisms. This chain of eating and being eaten is called food chain.

Q.4 What are decomposers?

Ans. The microorganisms which convert the dead plants and animals to humus are known as decomposers.

Q.5 How do the forest officers recognize the presence of an animal in the forest?

Ans. By the droppings and footprints of the animals.

Q.6 What do you know about understoreys?

Ans. The trees have crowns of different types and sizes. They create different horizontal layers in the forest. They are known as understoreys. Giant and tall trees constitute the top layer, followed by shrubs and tall grasses, and herbs forming the lowest layer.

Q.7 How does the forest floor look like?

Ans. The forest floor looks dark-coloured and covered with a layer of dead and decaying leaves, fruits, seeds, twigs and small herbs. The decaying matter is moist and warm. Walking over the dead leaf layer on the forest floor is like walking over a spongy carpet.

Q.8 Explain, how forest help in controlling floods and maintain steady supply of water?

Ans. The uppermost layer of the forest canopy intercepts the flow of raindrops and most of the water comes down through the branches and the stems of the trees. From there it drops slowly over branches of the shrubs and herbs.

Thus, forest acts as a natural absorber of rainwater and allows it to seep. It helps to maintain the water table throughout the year.

Thus, we can say that forests not only help in controlling floods but also help to maintain the flow of water in the streams so that we get a steady supply of water.

Q.9 Why are forests called green lungs?

Ans. Plants absorb carbon dioxide from atmosphere for photosynthesis and release oxygen. Thus they help to maintain the balance in the oxygen and carbon dioxide level in atmosphere. That is why forests are called green lungs.

Q.10 Explain that the forest is a dynamic living entity.

Ans. The green plants prepare food. The herbivores depend for their food on plants. Carnivores eat herbivores. Decomposers decompose all the dead plants and animals. Animals help the plants to grow by dispersing their seeds. Thus, all the components in a forest are in a dynamic equilibrium.

Q.11 Describe the consequences of deforestation.

Ans. (1) If forests disappear, the amount of carbon dioxide in air will increase, resulting in increase in the temperature of earth's atmosphere.

(2) In the absence of trees and plants, the animals will not get food and shelter.

(3) In the absence of trees, the soil will not hold water, which will cause flood as well as become the reason of soil erosion.

(4) Deforestation will endanger our life and environment. Think, what can we do to preserve our forests.

Section – B

PREVEIOUS YEAR'S NSO QUESTIONS

Q.1 **Statement I :** We should plant eucalyptus trees along all sewage ponds.

Statement II : Eucalyptus trees absorb all surplus waste water rapidly and release pure water vapour into the atmosphere. **[NSO 2010]**

(A) Both statements I and II are true and statement II is the correct explanation of statement I.

(B) Both statements I and II are true but statement II is not the correct explanation of statement I.

(C) Statement I is true but statement II is false.

(D) Both statements I and II are false.

Q.2 Read the given statements and select the correct option.

Statement 1 : Forests prevent soil erosion.

Statement 2 : Canopy formed by crown of leaves of forest trees reduces the force and speed of raindrops. **[NSO 2012]**

(A) Both statements 1 and 2 are true and statement 2 is the correct explanation of statement 1

(B) Both statements 1 and 2 are true but statement 2 is not the correct explanation of statement 1.

(C) Statement 1 is true but statement 2 is false.

(D) Both statements 1 and 2 are false.

CONCEPT APPLICATION LEVEL - III

SECTION - A

- **Fill in the blanks with suitable words.**

1. In a forest, trees form the uppermost layer, followed by _____ . The _____ form the lowest layer of vegetation.
2. Different layers of vegetation provide _____ and _____ for animals.
3. The forest keeps on _____ and _____ and can _____ .
4. Forests protect the _____ from erosion.
5. _____ helps forests to grow and regenerate.
6. Branchy part of a tree above the stem is known as the _____ of the tree.
7. Plants release _____ through the process of photosynthesis.
8. Microorganisms convert dead animal and plant tissues into a dark-coloured substance called _____.

SECTION - B

- **Match the following (one to one)**

Q.1 Match the items given in Column I with those given in Column II:

Column I	Column II
(i) Micro-organism act upon the dead plant to produce	(a) vulture
(ii) Scavenger	(b) canopy
(iii) Help in maintaining the supply of nutrients to growing plants	(c) food web
(iv) Roof of the forest made by the branches of tall trees	(d) forest protect
(v) Number of food chain	(e) autotrophs
(vi) Soil erosion	(f) purifier of air and water
(vii) Green plants	(g) saprotrophs
(viii) A forest acts as	(h) humus

SECTION - C

- **Mark 'T' if the statment is true and 'F' if it is false:**

1. We get various useful products from the forests surrounding us.
2. Forest is a system comprising various plants, animals and microorganisms.
3. Forests must be cleared to make the human life safe and comfortable.
4. Different layers of vegetation provide food and shelter for animals, birds and insects.
5. Plants release carbon dioxide in the process of photosynthesis.
6. The various components of the forest are interdependent on one another.
7. In the forest there is interaction between soil, water, air, and living organisms.
8. Forests are the lifeline for the forest-dwelling communities.
9. Forests are the result of hard working of ancient people who have planted most of the forests.
10. Forests influence climate, water cycle and air quality.

SECTION - D

- **Choose the correct option in the following:**

1. Which one of the following is not a wild animal?
   (A) Bear (B) Bison (C) Jackal (D) Goat

2. Which one of the following is an animal product?
   (A) Gum (B) Catechu (C) Honey (D) Rubber

3. Roof of the forest made by the branches of the tall trees is called
   (A) canopy (B) crown (C) understoreys (D) none of these

4. Understoreys are formed due to
   (A) different types of crowos (B) different sizes of crown
   (C) different heights of trees (D) all of these

5. Decomposers convert the dead plant and animal tissues into
   (A) clay (B) humus (C) inorganic debris (D) soil

6. Arrange the following components of a food chain in proper sequence-grass, frog, eagle, insects, snake.
   (A) Grass $\longrightarrow$ insects $\longrightarrow$ frog $\longrightarrow$ snake $\longrightarrow$ eagle.
   (B) Grass $\longrightarrow$ snake $\longrightarrow$ insects $\longrightarrow$ frog $\longrightarrow$ eagle.
   (C) Grass $\longrightarrow$ snake $\longrightarrow$ eagle $\longrightarrow$ insects $\longrightarrow$ frog.
   (D) All are possible

7. Sequence that represents the series of eating and being eaten is called
   (A) food series (B) food chain (C) food web (D) food hub

8. Which one of the following is a role of forests?
   (A) Provide, food, shelter, water and medicines (B) Prevent soil erosion
   (C) Prevent flood (D) All the above

ANSWER KEY

CONCEPT APPLICATION LEVEL - II

SECTION - B

Q.1 C Q.2 A

CONCEPT APPLICATION LEVEL - III

SECTION - A

1.	shurbs, herbs	2.	food, shelter	3.	growing, changing, regenerate
4.	soil	5.	soil	6.	crown
7.	oxygen	8.	humus		

SECTION - B

1. (i)-(h), (ii)-(a), (iii)-(g), (iv)-b), (v)-(c), (vi)-(d), (vii)-(e), (viii)-(f)

SECTION - C

1.	True	2.	True	3.	False	4.	True
5.	False	6.	True	7.	True	8.	True
9.	False	10.	True				

SECTION - D

1.	D	2.	C	3.	A	4.	D	5.	B	6.	A	7.	B
8.	D												