

Programme Name: B.Sc. (H) COMPUTER SCIENCE

SEMESTER-II

Title: EVS ASSIGNMENT

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Question 1. Write a brief introduction about Yamuna Biodiversity Park?

Yamuna Biodiversity Park is located on Yamuna River front and has 9770 hectares biodiversity area in Delhi, India. It is developed by Delhi Development Authority with the technical help of Centre for Environmental Management of Degraded Ecosystems, University of Delhi. It emerged as the capital's most visited place and prominent Centre for learning and understanding the environment. The park has become a home for a diversity of forest communities, biologically rich wetlands, grasslands communities, a wide variety of fruits yielding species and an abundance of medicinal herbs. The park has also comprises native flora and fauna which used to exist many decades before and then become extinct locally.

The Yamuna Biodiversity Park set an example for environmental conservation in the country, as it has grown from a barren land to a rich ecosystem with thousands of plants, animals and hundreds of birds species, as well as a closed canopy forest with trees as high as 45 feet. The park initially only had mangroves and lizards and 31 species of birds in 2004. Now, it has grown into a natural reserve and is home to 1500 species of plants and animals, including antelopes, hog deers and porcupines and 200 species of birds.

The land earlier had salt accumulation in the soil, due to which only salt loving plant would survive there.

The scientists said that Yamuna Biodiversity Park has about 1000 species of flowering plants which used to exist in the flood plains several decades ago. The species have been thriving in the form of 20-25 plant communities now. The Yamuna Biodiversity park is based on the ecosystem model. It is 10-year old plantation. The ecosystem is fully developed.

In the first phase, nearly 100 acres of wetlands would be created which will hold 500 million gallons of floodwater. This, according to environmentalist, will recharge the groundwater that will ultimately benefit people living along the alluvial plains of Delhi.

The Biodiversity Park, which represents Delhi's natural heritage and rich biological diversity of the flood plains of Yamuna river, has also become a means of promoting natural education among school and college students. As many as 40,000 students and public from all across the world.

visit the park annually. This park is open to public only if they come in groups and are accompanied by a guide, to prevent the park from further pollution.

Yamuna Biodiversity Park has two major zones - the visitor zone and the nature reserve zone. Enclosed by a hedge of poplars, it features plants like Ailanthus, Butea and Bauhinia, that have a continuous seasonal interest due to their long flower production throughout the season. The outer iron fencing is embraced by multi-coloured climbers like Jasmine and Quisqualis with the same theme of continuous luxury.

Ten mounds in the visitor area illustrate the different forest ecosystems in its miniature form found all along the Yamuna River Basin. The composition of forest, as in nature, consists of three to four layers: a tree canopy that supports climbers and provides shade for the middle storey tree layer and shrub layer which in turn protect the ground-cover of herbs and grasses. The conservatory house has different kinds of birds such as parakeets, yellow footed green pigeons, munias, babblers, etc. as well as diversity of snakes. The Herbal Garden is a collection of around 450 living species that have been important in human culture throughout ages. Butterfly conservatory has become major ecotourism destination for visitors and nature lovers. The Bambusetum, a symbol of endurance and resilience, allows specialists to study the diversity of bamboo species while generalists to enjoy their variety; the climbing Ochlandra, shrub-like Arundinaria, the pole like golden bamboo, etc.

Two wetlands, which stimulates natural water bodies, have been created in the park. One which is long and narrow stimulating the river, is 1.8 km long; and the second, which is more open and deep, is spread over about 2 hectares. The wetlands add to diversity of habitats, performs the much-needed ecological functions of water purification, groundwater recharge and storage of rainwater & also provides the soil for raising the ground level to avoid flooding in the post monsoon period so that the development of terrestrial ecosystem and plant communities can go ahead unhindered.

Question 2. Name any five native plant species and discuss their ecological importance.

[1] Ashoka \Rightarrow *Saraca Asoca* [Botanical name]

Ashoka is a small medium-sized evergreen tree species growing to a maximum height of 9 meters.

Ashoka - 'A Threatened Tree species of Immense Economic Importance in India'

- Medicinal values :- The Bark extract is used for the treatment of uterine disorder particularly, menorrhagia and helps to cure ulcers and pimples. Flowers pounded in water are used in treatment of haemorrhagic dysentery.
- Ornamental values :- The evergreen foliage and flowers make it handsome tree hence it is planted in residential area.
- Green Belt value : Ashoka is tolerant of air pollution and is effective in noise pollution. So it is recommended for 'green Belts'.
- Sacred values : Being regarded as a sacred tree by Hindu and Buddhist it is planted near temples.

[2] Amaltas \Rightarrow *Cassia Fistula* [Botanical name]

The wood is very hard and very heavy. The timber is difficult to season, and liable to severe surface seasoning defects. The trees can best be guided to reduce these defects. It yields a durable timber considered to be better than sal and is used everywhere for house posts, bridge, shafts of carts, etc. It is excellent fuel wood and yields excellent charcoal. It produces smooth grained leather. The pulp of ripe pods is very strong purgative and eaten and made into a drink.

[3] Gulmohari ⇒ *Delonix Regia* [Botanical Name]

The wood is employed locally for agricultural implements; handled for carpentry tools, camels, etc. The tree is mainly valued for its seeds, leaves, shades and ornamental value. The seeds yield "kauranga" oil of commerce. The main use in tanning industry. The oil possess insecticidal and anti-bacterial properties. The seed is caustic, purifies and enriches the blood. The tree is mainly grown for its shade and ornamental value. Because of its hardy nature and aggressive root system. Good tree to control soil erosion.

[4] Jacauanda ⇒ *Jacauanda mimosifolia*

Jacauanda is mainly planted as an avenue plant but the but fragrant wood is locally used for tool handle. The wood is light and slightly fragrant. The branches and stem of dead and dry trees are utilized, generally as firewood. The dried leaves of Jacauanda are used in ointment for healing wounds. An infusion of the bark is used for washing ulcers. The bark is used as a lotion for washing ulcers. The bark and leaves are used for treating syphilis and gonorrhoea. Bark and leaves are used for ~~Blennorrhagia~~.

[5] Mahuwa ⇒ *Madhuca longifolia* [Botanical Name]

The Timber can be put to a variety of uses such as Building purposes as Beams, door, etc. It is suitable for heavy work such as Bridges, pile, sugar presses, ships, boats, etc. The tree is of multiple use to the local inhabitants for its leaves, flowers, etc. The fleshy cones are edible as they are a rich source of sugars, vitamins and essential oils. Flowers are largely used for preparation of country made distilled liquor. The outer part of the fruit is eaten raw or cooked and the inner part is made into flour for cake. The leaves yield fodder of medium quality and are chopped in M.P, U.P at time of scarcity.

Question 3. Explain Functions an Ecosystem?

Ecosystem

An ecosystem is a community of living organisms in conjunction with nonliving components of their environment, interacting as a system.

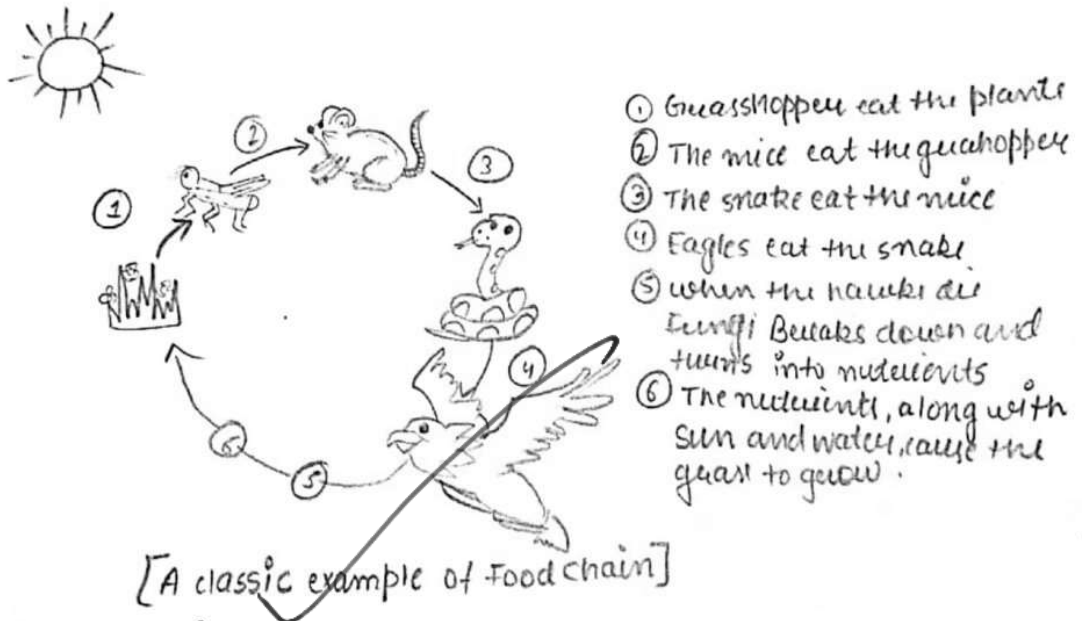
Functions of Ecosystem

- ① It regulates the essential ecological processes supports life systems and ensures stability
- ② It is also responsible for the cycling of nutrients between Biotic and abiotic components.
- ③ It maintains a Balance among the various trophic levels in the ecosystem.
- ④ It cycles the minerals through the Biosphere.
- ⑤ The abiotic components help in the synthesis of organic components that involves the exchange of energy.

Important ecological Concepts

1. Food chain: The sun is the ultimate source of energy on earth. It provides the energy required for all plant life. The plants utilize this energy for the process of photosynthesis, which is used to synthesize their food. During this Biological process, light energy and is passed on through successive levels. The Flow of energy from a producer, to a consumer and eventually, to an apex predator or a detritivore is called the food chain.

Dead and Decaying matter, along with organic debris, is broken down into its constituents by scavengers. The reducers then absorb these constituents. After gaining the energy, the reducers liberate molecules to the environment, which can be utilised again by producer.



2] Ecological Pyramids

An ecological pyramid is the graphical representation of the number, energy and Biomass of the successive trophic level of an ecosystem. Charles Elton was the 1st ecologist to describe the ecological pyramid and its principles in 1927. The Biomass, number, energy of organism ranging from the producer level are represented in the form of a pyramid, hence, it is known as the ecological pyramid. The Base of the ecological pyramid comprises the producer, followed by primary, secondary consumers. The Tertiary consumers hold the apex. In some food chains, the quaternary consumers are at the very apex of the food chain.

The producers generally outnumber the primary consumers and similarly, the primary consumers outnumber the secondary consumers. And lastly, apex predators also follow the same trend as the other consumers; wherein their numbers are considerably lower than secondary consumers.

3] Food Web

It is a network of interconnected food chains. It comprises all the food chains within a single ecosystem. It helps in understanding that plants lay the foundation of all the food chains. In a marine environment, phytoplankton forms the primary producer.

Question 4 What is eutrophication?

DEFINITION!

Eutrophication is an enrichment of water by nutrient salts that causes structural changes to the ecosystem such as: increased production of algae and aquatic plants, depletion of fish species, general deterioration of water quality

Causes

These structural changes mainly depend on 3 factors: -

- use of Fertilizers: Agricultural practices and the use of fertilizers in the soil contribute to the accumulation of nutrients. When these nutrients reach high concentration levels and the ground is no longer able to assimilate them, they are carried by rain into rivers and groundwater that flow into lakes or sea.

- Discharge of waste water into water bodies: In various parts of the world and particularly in developing countries, waste water is discharged directly into water bodies such as rivers, lakes and seas. The result of this is the release of a high quantity of nutrients which stimulates the disproportionate growth of algae. In industrialised countries, on the other hand, waste water can be illegally discharged into water bodies. When instead water is treated by means of water treatment plants before discharge into the environment, the treatments applied are not always such as to reduce organic load.

• Reduction of self purification capacity:

Over the years, lakes accumulate large quantities of solid material transported by the water. These sediments are such as able to absorb large amounts of nutrients and pollutants. Consequently, the accumulation of sediments, the resuspension of nutrients present at the bottom is facilitated.

CONTROL :-

• The possible activities to be undertaken to prevent the introduction of nutrients and to limit production phosphorous loads can be summarised as follows:-

Improvements of purifying performance of waste water treatment plants, installing tertiary treatment system to reduce nutrient concentrations

Implementation of effective filter ecosystems to remove nitrogen and phosphorous present in run-off water

reduction of phosphorous in detergents

rationalisation of agricultural techniques through proper planning of Fertilization and use of slow release fertilizers.

use of alternative practices in animal husbandry to limit the production of waste water

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