MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD, PUNE
SEMESTER END EXAMINATION
B.Sc. (Agri.) OLD

Semester	: I	Academic Year	: 2017-18
Course No.	: BOT-111	Title	: Environmental Science
Credits	: 1+1 = 2	Total Marks	: 40
Day & Date	:	Time	:

SECTION – A

Q. 1 Define environment science and give its importance.

Answer : -

"Environment science is the study of physical chemical and biological conditions surrounding the living organisms which influence them internally or externally".

Environment consists of mutually interacting system of physical and biological elements. In order to maintain these interactions there is urgent need to protect the environment. This will maintain the quality of life of better future for further generations. It has importance due to following reasons.

1) Environment studies help to understand relations between biotic and abiotic components of the universe it helps in maintenance of life and health.
2) Environment studies helps to understand different food chains, food web, ecological niche, so that ecological balance can be maintained.
3) Environment studies helps to understand and appreciate how the environment helps for making a living structure and for promoting a material culture.
4) Environment management is key aspect of environment studies, which is important part of environment studies.
5) It helps to understand beauty of nature and social value of nature.
6) Environment studies going to help in solving problems and human attentions towards population explosion, air, water and soil-pollution.
7) Environment is continuous system of output and input of matter and energy it has its own productivity. It generates organic matter, it tends to maintain ecological balance.

Q. 2 What are natural resources ? Classify them on the basis of quantity, origin and utility. Give examples of them.

Answer : -

Man needs many things to live (survive). All these things are available from nature. These useful things present in nature are known as natural resources i.e. Forest, water, minerals, energy, land, food and air.

Classification of natural resources :

A) Based on utility : Few natural resources are last in short time where as other natural resources are last for long period, thus depending upon the availability of resources in nature during our continuous use are classified as (i) Renewable (inexhaustible), (ii) Non-renewable (exhaustible), (iii) Cyclic resources.

i) Renewable resources, e.g. – Water, forest, animals, agriculture, fisheries – these are constantly regenerated.

ii) Non renewable resources – e.g. Mineral, oil, natural gas – resources once used there is no hope of recovery.

iii) Cyclic resources – e.g. water used in industry – natural resource can be used again and again called cyclic resource. Hence they use continuously.

B) Based on origin : (i) Biotic, (ii) Abiotic resources

i) Biotic resources- (Organic resources) : These resources are 'Flora' and 'Fauna' as biosphere of nature. i.e. Forest, crops, birds, Animals, fisher.

ii) Abioitc resources : These are in the form of non-living inorganic matter. E.g. soil, minerals.

C) Based on utility : On the basis of utilization of natural resources are classified as.

i) Food resource – e.g. Food grains, fruits, vegetable etc.

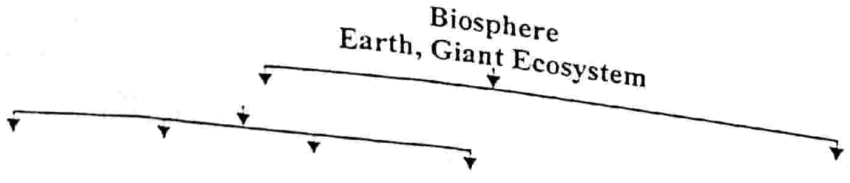
ii) Raw material – e.g. minerals, metals, soil etc.

iii) As a energy – e.g. Coal, oil, thermal electricity etc.

Q. 3 What are the types of ecosystem ? Describe Oceanic ecosystem.

Answer : -

The ecosystems are the basic functional, ecological units. There are several ecosystem at micro and macro level but earth biosphere is giant ecosystem. Biosphere is biggest ecosystem which combine all the ecosystems of the world. Due to difference in physiography, climate, soil, water bodies ecosystems can be divided in to different ecosystems.



Terrestrial				Aquatic	
Forest	Desert	Grass land	Man engineered	Fresh water (pond, rive)	Marine water

There are two types of ecosystems :

(A) Natural Ecosystem – (1) Terrestrial consists of Forest, Grassland and Deserts. Aquatic – Ocean marine and fresh water.

(B) Man Engineered or Artificial systems. – Cropland, urban, industrial. **Oceanic Ecosystem : (Marine Ecosystem)** Marine or oceanic ecosystem is occupied by oceanic salty water which is about 70 % of earths area. The oceanic ecosystem is with deep water, it is in continuous circulation. Oceans are large factories of life as this ecosystem provides variety of nutrients to both marine and land organisms. Oceanic environment is more favourable to life than land.

Abiotic components : Oceanic water salinity varies from one place to other as per amount of dissolved salts of sodium, potassium, calcium, magnesium, sulphar etc. salinity is about 3.5 % to 27 % is sodium chloride. Sea water has high level of chlorides about 18990 mg/lit. pH of water ranges from 7.5 to 8.4 and mainly alkaline. Oxygen level reduces with depth. Carbon dioxide level is good so that worlds 90 % photosynthesis going on in oceatic environment. Sea water contents ammonium nitrates and phosphates in appreciable quantities. Temperature ranges form 30-50°C. While polar sea is 7.9°C. The average depth of oceanic system varies around 2-3 miles to 6.2 miles.

Biotic Components : a) Producers – They are variety kinds present up to 80 meters of depth. At surface level phytoplankton's like diatoms, algae presents.

b) Consumers – Primary consumer are herborours like crustaceans, molluces, fish etc.

Secondary consumer are carnivores like fish, sea animals, that feed on herbivores.

Tertiary consumer are top consumer and fishes like cod, haddock etc.

Decomposers: They are microbes active in decay of organic matter of producers which includes marine fungi and bacteria.

Q. 4 Define ecological pyramids. Describe different types of pyramids with suitable diagrams.

Answer : - Ecological pyramids are the diagrams of data representing the tropic structure and function of successive tropic levels i.e. producer-herbivores-carnivores

Ecological pyramids are of three types :

1) Pyramids of number of grassland ecosystem.
2) Pyramids of biomass in pond ecosystem.
3) Pyramids of energy.

Description of above types with diagrams.

Q. 5 **Define biodiversity. Describe aspects of Genetic biodiversity, Species biodiversity, Ecosystem biodiversity and landscape biodiversity in short.**

Answer : -

"Biodiversity is the variability among living organisms and the ecological complexes of which they are part, including diversity within and between species and ecosystem".

(1)

a) **Aspects of Genetic biodiversity :** It is a diversity within species, it refers to the variation of genes within species. This diversity constitutes distinct population of the same species.

b) **Species diversity :** It is most basic level of biodiversity pattern. It is diversity between species. It refers to the variety of species within a region. In a full range of species like bacteria, viruses, plants fungi of global level.

c) **Ecosystem diversity :** Is the number of species (microbes plants, animals) in community of organisms found in different environment, it is diversity of organisms exist in different land forms. This diversity is difficult to measure. Ecosystem diversity is thus distinctive assemblage of species that live together in the same area and intacts with the physical environment in unique ways.

d) **Landscape biodiversity :** Is the size and distribution of several ecosystems and their interactions across a given land surface. Mathematical indices of biodiversity are called Alpha, Beta and Gamma diversity. Alpha diversity is number of species in a single community i.e. species richness. Beta diversity is degree to which species composition changes along an environmental gradient. Gamma diversity is species turnover rate with distance between sites of similar habitat.

Q. 6 **Define environmental pollution. Give the types of pollution. Describe sources of water pollution.**

Answer : -

Pollution is an undesirable change in the physical, chemical and biological characteristics of any component of the environment (air, water, soil) which can cause harmful effects on various forms of life or property. Pollution involves an unhealthy mixture of foreign matter or energy in to the environments which makes it harmful to life activities.

Types of environmental pollution :

i) Water pollution, ii) Air pollution, iii) Soil pollution, iv) Noise pollution,
v) Thermal pollution, vi) Radioactive pollution, vii) Marin pollution,
viii) Soil waste pollution

Water pollution sources : Water has the property to dissolve many substances in it, therefore it gets easily polluted. The common sources of water pollution can range from purely natural to several man made sources like discharge of domestic and industrial waste. Pollution of water can be caused by point source or non point sources. The point sources are industrial discharges where non point sources are scattered sources. Which individually or collectively pollute water e.g. rain water from road or agriculture field.

Q. 7 What are Indian Environment laws ? Describe advantages of forest conservation Act (1980).

Answer : -

There are about 200 laws dealing with environment protection both before and after independence in India. Indian Penal Code 1860 had a chapter (Ch. XIV) which dealt with offences affecting the public health, safety and convenience which covered aspects like water, air and noise pollution. The past independence laws given below deal exclusively with environment protection.

1) The wildlife protection Act, 1972
2) The water prevention and control of pollution Act, 1974
3) The forest conservation Act, 1980
4) The air prevention and control of pollution Act, 1981
5) The environment protection Act, 1986
6) The public liability insurance Act, 1991

Advantages of forest conservation Act, 1980

According to National Forest Policy, 1952 one third of the geographic area of the country should be under forests. There are several advantages of forest conservation Act (1980) are listed below.

1) The dense forest cover i.e. a crown cover of 40 % (1951-52) has increased from 59 % (1985-86) to 60 % (1997-88).
2) During 1950-1980 the rate of forest depletion was 1500000 hectares /year. After forest conservation Act 1980 it was dropped to 16000 hectares /year.
3) The prices of timber and firewood have declined and became steady after 1988.
4) The area under forest was increased from 14.5 % (1950-51) to 22.00 % (1988-89).

The forest conservation Act, 1980 was amended in 1983, 1988-89 and 1994. There are six regional offices monitor the auditions and safeguards in forest, conservation matter by department of environment and forest and wildlife. These offices are located at Bangalore, Bhopal, Bhubneshwar, Lucknow, Shillon and Chandigarh.

Q.No. 8 What do you mean by information technology ? Enlist different IT useful in environment and explain role and application of IT in environment

Answer. Definition: Information technology refers to the study, development, implementation, support or management of computer based information system particularly software application.

Different Information technology:-

1. Remote sensing technology (RS) 2. Geographical information system (GIS)
3. Global positioning system (GPS) 4. Internet and computes

Role and application of IT in environment protection:
Following are some of the application an role of IT in the field of environment management

1. Forestry 2. Bio-diversity conservation 3. Environmental management: i) Water Pollution ii) Air Pollution iii) Land Pollution
4. Natural resource management (Explanation of above is to be given)

Q.No. 9 What is Disaster ? Enlist types of disaster. Explain the flood disaster.

Answer :- Any occurrence causing damage, ecological disruption, loss of human lives, Deterioration of health and health services on a scale sufficient to warrant any extraordinary intervention from outside the affected community .

OR

As an occurrence or event that causes sudden great loss to wealth or life or both.
Types of Disaster :

1.Flash floods 2. Tropical cyclones 3.Droughts 4. Earthquakes
5. Tsunami 6. Land slide 7 . Volcanoes

Flood disaster :

Flood can be caused by natural, ecological or anthropogenic factors either individually or as a combined result. Only 18% of the rainwater can be stored in dams, while 82% flows through rivers ultimately into the sea. Floods will be a recurring phenomena in our country. Deforestation and shifting cultivation can also contribute to floods.

Q.No. 10 Write short Note on(Any Two)

a) Energy flow in ecosystem : Every ecosystem has several interrelated mechanism that affect human life. These are i) water cycle, ii) carbon cycle, iii) oxygen cycle iv) Nitrogen cycle, v) Energy cycle. All these processes depend on energy form sunlight and how it is released. How much it reaches earth surface and how much absorbed by atmosphere with diagram.

b) Conservation of biodiversity: In- situ conservation: Genetic species can be pressed in situ i.e. preserved area like national park and wild life sanctuaries preserve major wildlife species such as tigers, lions, elephants and deer. Ex-situ conservation: The conservation of a species is best done by protecting its habitat along with all the other species that live in nature. This is known as in situ conservation by creating national parks and wildlife sanctuaries. Such as botanical garden for plants or a zoological part for animals.

c) Rain water harvesting: It is the activity of direct collection of rain water. Rain water can be stored for direct use or can be recharged into the ground water aquifer. Rain water is the ultimate source of fresh water. Rain water harvesting advantages are like it provides self sufficiency to water supply,. Reduces the cost for pumping of ground water, Provides high quality water, soft and low in minerals. Etc.

SECTION – B

Q. 11 Define.

1)	Pollutant	Anything that pollutes the environments
2)	Community	A naturally occurring group of organisms living in common environments.
3)	Food web	In nature food chains are interlocked & form a complex network
4)	Savanah	A grassland with occasional trees.

Q. 12 Match the pairs

i)	Man	c)	Omnivorous
ii)	Herbivores	a)	Primary consumers ~~River~~
iii)	Lotic environments	b)	River
iv)	Producers	d)	Autotrophs

Signature of Course Instructor
Name : Dr. Tandale M. D.
Mob. 9960886708

Signature of Head of the Department
Name :
Ph.