Model Answer Paper

MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD, PUNE

SEMESTER END THEORY EXAMINATION

B.Sc. (Hons.) Agriculture

Semester	: III (New)	Term	: I	Academic Year	: 2022-23
Course No.	: ESDM 231	Title	: Environmental Studies amd Disaster Management		
Credits	: 3(2+1)				
Day & Date	:	Time (hrs.)	: 3 hrs.	Total Marks	: 80

Note :
1. Solve **ANY EIGHT** questions from **SECTION "A".**
2. All questions from **SECTION "B"** are compulsory.
3. All questions carry equal marks.
4. Draw neat diagrams wherever necessary.

SECTION 'A'

Marking scheme

Q.1 Define environment. Enlist different protection acts of environment. Explain forest conservation act.

Ans: Environment is the sum of all physical, chemical, biotic and cultural factors that affect life of the organism in any way . (2)

Protection Acts of environment . (2)

1. The environment protection Act
2. The Air protection Act
3. The water protection Act
4. The Forest conservation Act
5. The Wild Life Protection Act

Forest conservation Act : . (4)

The Indian forest Act of 1927 consolidated all the previous laws regarding forests that were passed before 1920. The Act gave the govt. and forest department, the power to create reserved forests and the right to use reserved forests for govt. use alone.

New forest conservation Act of 1980, which was amended in 1988.The new act forest conservation Act 1980 released for protecting forests for timber production and other values and its valuable assets such as biodiversity.

Policy : India's first forest policy was incorporated in 1952. Between 1952-1988 the extent of deforestation was so great that it became essential to formulate a new policy on forest and their utilization.

1. Protection of forest.
2. Maintenance of soil and water regimes
3. Conservation of forest as natural heritage.
4. Preservation of its biological diversity and genetic resources.
5. Meet the need of local people for food fuel wood, fodder and NTFPS.
6. Maintain environmental stability and ecological balance.
7. In 1992, 73rd & 74th Amendments for local panchayats with authority to manage local forest resources
8. Control deforestation.

Penalties :

a) Penalties for offences in reserved forest

1. No person is allowed to make clearings or set fire.
2. Cattle are not permitted to trespass.
3. Felling, collecting of timber, bark or leaves and forest product is punishable with imprisonment of 6 months or with a fine to Rs. 500/- or both.

b) Penalties for offences in protected forest: felling trees, collecting bark or leaves, setting fire, spreading of fire, permitting cattle to damage and tree. Imprisonment 6 month or fine Rs. 500/- or both.

Q.2 Define natural resource. Enlist types of natural resources. Explain in detail renewable resources with example.

Ans: Natural Resource: Any material which is required or used to sustain life is called resource. The resources which are present in nature are called natural resources.

They are two types. .

1. **Renewable resources:** The resources that can be replenished by natural cycles or come from inexhaustible source are called renewable resources eg. Water, solar energy, tidal energy, wind energy, plants and animals.
2. **Non-renewable resources:** The resources that can't be replenished through natural processes are called non-renewable resources eg. Fossil fuel, metals.

Renewable resources: . (4)

In case of renewable resources we have to take care that their use should not be more than their natural recycling. Although water and biological living resources are considered renewable.

Water is the first major resource to be considered as renewable. In fact renewable only within certain limits because it is linked to natural cycles called water cycle.

Another important renewable natural resource is forest. If forests, once destroyed take 1000's of years to re-grow in to fully developed natural ecosystem with their components forest can thus be said non-renewable resource if over used.

Thirdly the fishes, if they have been caught continuously, they are incapable of breeding successfully to replenish or rebuilt their population. Thus they can be treated as renewable food source.

Similarly fertility of land mismanaged, it will not produce food grains. When the population of a species of plant and animal is reduced by human activities until it cannot reproduce fast enough to maintain a viable number the species becomes extinct.

Q.3 Define ecosystem. Explain structural and functional components of an ecosystem.

Ans: Ecosystem: The natural unit of the living organism (living community plants and animals) in any area together with non-living components (soil, light, temperature, humidity, atmosphere, etc.) Function together as one unit called the ecosystem. (2)

Structural components : .

Structural component means composition of ecosystem. Composition of biological community including species, numbers, biomass. Quantity and distribution of non living matters like nutrient water. Range of radiant of condition of extension. (3)

1	Inorganic compounds	C,N, Co_2,H_2o
2	Organic compounds	Protein, Carbohydrates & Lipids
3	Climatic regimes	Temperature, moisture, light & topography
4	Producers	Plant
5	Macro-consumers (Primary, secondary & tirtary consumers)	Members of food chain Phagotrophs (Large animal)
6	Micro-consumers	Saprotrophs (Bacteria & fungi)

Functional aspect : Rate of biological energy flow t.e. production, consumption & becomposition (3)

1. Energy cycles & Nutrient cycles
2. Food chains
3. Diversity – Interlinks between organisms
4. Evolution

Q.4 Define environmental studies. Explain scope and importance of environmental studies.

Ans: Environment studies deals with every issue that affect an organism. It is an applied science as it seeks practical answer two making human civilization sustainable on the earth's finite resources. (2)

Scope : Originally our surrounding is natural landscape but it is modified by human being for different purpose. Human being uses different natural resources. He can not live without it. But excess use of it has created number of problems. In order to have use of resources on long term every body should know it and use sustainably and wisely. (3)

Importance : Environment is integration of several subjects. To know the environment we must know all the related sciences. The natural resources are limited. The earth can not sustain expanding level of utilization of natural resources. To avoid further degradation each of us should take action which will help to save our environmental resources. (3)

Q.5 Define information technology. Explain the role of information technology in environment protection.

Ans: **Information Technology-** Application of computer and other technologies to acquisition, organization retrieval and dissemination of information. (2)

Role of information technology on environment protection: (6)
Role of GIS, remote sensing on environment is as follows:
1. Forest resources are important and linked with environment and biodiversity. Remote sensing is used to map forest and access forest stock, density and status of forest.
2. Remote sensing conduct detailed survey of biodiversity and conservation of ecosystem. It is used for biodiversity characterization at landscape level.
3. Remote sensing, GIS, GPS technology help for environmental management provided its capability to identify the source of pollution, accurately determine the location, extent and type of pollutants interfering with land, water, soil and air.
4. Green house gases, acid rains impact on air pollution have been successfully monitored.
5. These techniques proved the information about water quality parameters for control of water pollution.
6. Remote sensing help for management of natural resources proved information related to agriculture, forestry, land resources and soil mapping, surface and ground water and ocean resources. This information used for increase agricultural production without affecting ecological and environmental integrity.

Q.6 What is disaster? Enlist types of disasters. Explain the flood and earthquake disaster and its mitigation measures.

Ans: **A disaster** is a serious malfunctioning of a society leading to human, material or environmental loses. (2)

Disaster cause damage and disruption worldwide with a high frequency of natural calamities like **floods, droughts, land sliding, cyclones and earthquakes, forest fires as well as man-made tragedies like gas leak at Bhopal.** (2)

Floods and mitigation measures: (2)
Floods 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 recurring phenomena in our country. Deforestation and shifting cultivation can also contribute to floods. An increasing protection of a rainfall released shortly after precipitation in the form of floods.

Mitigation measures :

1. Reservoirs to be released in a regulated manner
2. Prevention of over bank spilling by construction of walls
3. Improvement of flow condition in channel
4. Improved drainage and maintain wetlands
5. Flood forecasting and warning services.

Disaster relief, flood fighting and public measures.

Earth quakes

Earth quakes occur due to friction between tectonic plates of earth. There are primary, secondary and tertiary waives generated through earth quakes. Point of origin of earth quick is known as centre of earth quick. Earth quick is measure in richer scale.earth quick above 6 richer scale causes great damage to human being .

Earth quakes rehabilitation should been done on a massive scale taking into the needs of the victims. The role of NGOs is very important. Their strength lies in their manpower, informality in operations and valuable human resources. Their ability to reach out to the community and sensitivity to local traditions is an asset in such situations. Coordanation between government, local NGOs and local community inititaves, both for rescue as well as rehabilitation, needs to be strengthened as this can cause delays, overlaps and waste of relief material and efforts. The construction of the house should be according to the earth quakes zone. The peapole are informed and educated regarding earth quake. Care should be taken regarding hygine and diseases as it may leads to epidimics of diseases.

Q.7 Define pollution. Enlist different types of pollutions. Explain causes and control measures of water pollution.

Ans: **Pollution** is defined as undesirable change in the physical, chemical or biological characteristics of air, water and soil that may affect or will affect human life, industrial progress, living condition, cultural assets and climate. . (2)

Water pollution : Any physical or chemical change in water which could adversely affect its use for domestic, irrigational and recreational purposes or adversely affect aquatic biota.

Types of pollutions: . (2)

Water pollution
Air pollution
Sound pollution
Soil pollution

Causes : . (2)

1. Nutrient and eutrophication.
2. Infectious agent like protozoan, bacteria and fungus.
3. Organic compounds- PCBS, Phenols, DDT
4. Sediment
5. Thermal discharge
6. Nuclear waste – radioactive substance
7. Heavy metals like cyanides, arsenic lead

Water quality is decided on basis of two parameters BOD and MPN.

Control : (2)

1. Self purification of water.
2. Installation of primary, secondary and tertiary treatment plant.
3. Legal enforcement of prevention and control of water pollution act 1974.

Q.8 Define sustainable development. Explain the measures for sustainable development.

Ans: **Sustainable development-** Meeting the needs of present without compromising the ability of future generations to meet their own needs. (2)

Measures for sustainable development : (6)

1. Using appropriate technology
2. 3-R Approach
3. Promoting environmental education awareness
4. Population stabilization
5. Conservation of non renewable resources
6. Usage of non renewable resources

Q.9 **Define biodiversity. Give classification of biodiversity. Explain the conservation of biodiversity.**

Ans: Biodiversity is the part of nature which includes differences in genes among the individuals of a species, the variety and richness of all the plants and animal species at different scales in space. (2)

Types of biodiversity (2)

1. **Genetic biodiversity :** Any animal or plant species differs widely from other individuals in its genetic make up, owing to the large number of combinations possible in to the genes that give every individual specific its characteristics.
2. **Species biodiversity :** The number of species of plants and animals that are present in a region constitutes its species diversity. It is seen in natural and agricultural ecosystems. Some area are richer in species than others.
3. **Ecosystem biodiversity:** Ecosystem biodiversity can be described for a specific geographical region, or a political entity such as a country a state or a taluka. It include landscapes like forest, grasslands, deserts, mountains, aquatic ecosystem like rivers lake, sea.

Conservation of biodiversity : (4)

1. In-situ conservation: Genetic species can be presented in situ i.e. preserved area like national park and wild life sanctuaries preserve major wildlife species such as tigers, lions, elephants and deer.

2. Ex-situ conservation: The conservation of a species is best one by protecting its habitat along with all the other species that live in it 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 park for animals.

Q.10 **Write short notes on (Any Two)** (4)

Ans: **1) Green house effect:**

Increasing Co_2 concentration in atmosphere acting as green house trapping incoming solar radiation and resulting in increase in atmospheric temperature

Causes of green house effect

1. Carbon dioxide, 2) methane, 3) Chlorofluorocarbon , 4) Nitrous oxide

Effect of green house

1) Climatic changes: Increase in temperature change rainfall pattern, melting a ice etc.

2) Effect on agriculture: Increase rate of photosynthesis, transpiration, disease and pest problem as well as yield of crop. (4)

2) Energy flow in ecosystem:

Every ecosystem has several inter-related mechanism that affect human life. These are i) water cycle , 2) carbon cycle, 3) oxygen cycle , 4) Nitrogen cycle, 5) 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 . (4)

3) Acid rain:

So_2 and No_2 is released in atmosphere as result of burning of coal and oil. It reacts with sunlight and form So_3 which later on react with water and forms H_2SO_4 and HNO_3, when get mixed with rain water; it makes water more acidic (pH 3.5 to 4.5) which is called acid rains. It causes tremendous damage to vegetation, streams and lakes because they became more acidic. In human it has harmful effect on nervous systems & digestive system. Use of sulpher free coal, CNG, natural gases and planting of trees are the preventive measures of acid rain.

SECTION 'B'

Q.11 **Define following terms. (One mark each)**

Ans: **1) Energy flow:** The passage of energy through the tropic level of food chain.

2) Savannah: The grassland with occasional lives in nature.

3) Commensalism: Commensalism is a symbiotic association, where one species is benefited and the other not harmed (or unaffected).

4) Carbon sequestration: Capturing and long term storage of carbon dioxide or other forms of carbon to control global warming

5) **Food web :** In nature food are interlocked and form a complex net work is called food web

6) **Ecological succession:** The occurrence of relatively definite sequence of communities over period of time in same area

7) **Volcano:** Volcano is a vent or opening in the earth's crust through which rock fragment, lava, ash, steam and other gases rise to the surface in the course of an eruption.

8) **Habitat:** The place where an organism lives in nature.

Q.12 **Do as directed. (One mark each)**

Ans: 1) **Give the full form of TDS.**
Total Dissolved Solids.

2) **Who gave the term ecosystem?**
A. G. Tansley.

3) **Give unit for measurement of noise pollution.**
Decibel (dB).

4) **What is example of nuclear disasters?**
Three mile island in USA or Chernobyl in U.S.S.R.

5) **Pyramids of energy are always in ~~which~~ direction of shape.**
Upright.

6) **What is mean by producer ?**
Plant which use solar energy and convert to food energy.

7) **Give the name of gas responsible for Ozone depletion.**
Chlorofluorocarbon (CFC).

8) **Which gases are responsible for global warming ?**
Co2 and Methane.

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