TEO(15) 3001.

Eight Semester Diploma Examination

Environmental Scienci and Disaster Management.

Q. NO:	Scoring Indicator	Split up Score -	Sub Total	Total.
I.	Part-A.			
1.	Mining is the proven of removing deposits of ores from substantially very well below the ground level.	2		2
2.	Eutrophication means over nourishment. Due to eutrophication lakes get invaded by algal blooms. These algal grows very fast by rapidly using up the nutrients; they often are toxic and badly affect the food chain.	2		2
3.	An ecosystem is defined as a natural functional ecological unit comprising of living organisms and their nonliving environment that interact to form a stable self supporting system.	2		2
4.	Air pollution is a release into the atmosphere of any substance, ex. chemicals or airborne particles, which are harmful both to the human and animal health as well as the health of the wider environment.	2		2
5.	Primary mitigation refers to reducing the resistance of the hazard and reducing vulnerability. Secondary mitigation refers to reducing the effects of the hazard.	2		2
II	PART-B			
1.	Food problem, Ecological imbalance, Increasing CO_2, floods leading to soil erosion, destruction of resources, Heavy silitation of dams, changes in the microclimate loss of bio-diversity, Heavy rainfall and high sunlight damage the top soil. The land will not be suitable for agricultural use. Environmental Pollution, global warming The occurence and strength of floods and droughts affecting the economy.	Any six points (6 x 1) with explm.	6	6.

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II 2.	deforestation, overgrazing, over utilization of ground water, mining and quarrying, climate change, pollution.	6 pts with expln	6.	6
3.	Primary Succession:- occurs in places where no living community existed before.	2		
	Secondary Succession:- when an area has been cleared by fire or by humans and then left alone, the surrounding ecosystem may gradually reinvade the area - not at once, but through a series of distinct stages termed Secondary Succession. Secondary succession starts with the pre existing soil substance.	2		
	Aquatic Succession:- Lakes or ponds are gradually filled and taken over by the surrounding terrestrial ecosystem. This process occurs because a certain quantity of soil particles inevitably erodes from the land and settled out in ponds or lakes, gradually filling them. As the building occurs, terrestrial species can advance, and aquatic species move further out into the lake. In short, the shoreline gradually advances towards the centre of the lake until finally the lake disappears altogether.	2	2+2+2	6.
4.	1) Forest has warm climate with adequate rainfall. 2) well defined seasons of about equal length 3) Protect biodiversity 4) Has tall and dense trees with many wild animals within eco system 5). Soil is rich in organic matter and nutrients 6) Forest grow very slowly 7). Provide various resources for human life. (6x1)	6	6	6.
5.	The discharge of effluents in receiving water body at a specific site are referred to as			

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	point sources in contrast of the inflow of pollutants in a different manner over a larger area referred to as non point sources. Point sources :- discharge from sewage treatment plants, thermal power plants and industries. Non point sources :- run off from agricultural fields and deforested areas into surface water bodies seepage into ground from croplands, logged forests and construction sites	3+3	6	6
6.	1. oxides of carbon – CO_2 & CO. a) use of coal and oil b) Biomass burning. 2. oxides of sulphur – SO_2 and SO_3 a) Burning of coal containing sulphur ore smelting b) Industrial process c) Municipal incineration. 3. oxides of nitrogen – N_2O, NO and NO_2. a) use of petrol and diesel b) burning of fuel c) Nitrogen fertilisers d) Burning of Biomass. 4. Methane and other Hydrocarbons. a. Burning of fossil fuel b) Rice cultivation c) Microbial activity of sewage.	Any three. 3×2		6.
7.	Hazard :- phenomena that pose a threat to people, structures or economic assets and which may cause a disaster. Types :- Technological hazards & Terrorism. Technological :- caused by accident, either through incompetence, poor planning, faulty equipment bad weather etc :- Intentional man made :- such as bombing. Un intentional or accidental :- Oil spill or train derailment.	4. Types 4	4+2	6.

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part - C.

III Effects :-

a. 1. Ground water pollution.
2. Surface water pollution
3. Air pollution.
4. Land subsidence.
5. De vegetation and defacing of landscape
6. Occupational health hazards.

exp en (6×1) 6 6

Remedial measures :-

1) Adopting eco-friendly mining technology
2) Utilization of low grade ores by using microbial leaching technique.
3) Re vegetating mined areas with appropriate plants.
4) gradual restoration of flora.
5) Prevention of toxic drainage discharge.

any four ½ 2 8

b. 1) use of high yielding varieties encourage monoculture.
2) Micronutrient imbalance.
3) Nitrate pollution. — Nitrate get concentrated in the water and when their concentration exceeds 45 mg/L, they become the cause of a serious health hazard called Blue baby Syndrome.
4) Eutrophication
5) Pesticide related problems
6) Death of non target organisms.
7) Biological magnification.

Expln of 7 pts 7

IV Causes :-

a. 1. Intensive irrigation leads to water logging and salinisation, on which crops cannot grow.
2. use of chemical fertilizers poisons the soil
3. depletion of forests and overgazing of grasslands
4. Highly toxic industrial and nuclear wastes dumping 5
5. growing of urban centres and industrial expansion.

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	Effects :-			
	1) Soil texture and soil structure are deteriorated			
	2) Loss of soil fertility.			
	3) Increase in water logging, salinity, alkalinity and acidity problems.	3	5+3	8
	4) Loss of economic social and biodiversity.			
IV	b. positive effects.			
	1) Increase the level of nutrients			
	2) farmers can double or even triple crop yields			
	negative effects			
	1) Nitrogen and phosphorus run off into local waterways during rainy periods.	Any 7pts		7.
	2) chemicals cause algae blooms in the water which then die, increasing the bacterial content.			
	3) Kills fish and disrupts the food supply of other animals that feed on the fish.			
V	a. Food chain :- The pattern of eating and being eaten forms a linear chain called food chain	2		
	Types :-			
	1) Grazing food chain – begins with green plants at its base as producers. Plants acts as the source of energy for the primary consumers. Primary consumer is a herbivore.	2		
	E.g. :- Grass → Rabbit → fox			
	2) detritus food chain :- This starts from dead and decaying organic matter of animal and plant bodies known as detritus. detritus acts as the source of energy for the primary consumers. These are present in all ecosystems but dominate in forest ecosystems. These food chains are located mainly in the soil or in the sediments of aquatic eco system.	2		

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V a) Significance The food chain helps to understand the feeding relationship and the interaction between organisms in an ecosystem. They also help us to appreciate the energy flow mechanism and matter circulation in ecosystem and understand the movement of toxic substances in the ecosystem and the problem of biological magnification.	2		8
b) The trophic levels of an ecosystem can be expressed in a diagrammatic way in the form of ecological pyramids. It consists of three parts, the base, body and the apex. producers form the base, body consists of successive trophic levels and the top carnivores form the apex. Three types:-	1		
pyramid of numbers:- This shows the relationship between producers, herbivores and carnivores at successive trophic levels in terms of their numbers.	2		7
Pyramid of biomass:- The pyramid of biomass is comparatively more realistic than the pyramid of numbers.	2		
Pyramid of energy:- The pyramid of energy is based on the total energy content of each trophic level.	2		
VI a. Types of forest ecosystem:- Coniferous — needle like leaves. Tropical — broad leaf Temperate — broad leafed deciduous trees			
Structure Abiotic — nonliving aspects of the forest Biotic — living aspects of the forest.			

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Scoring Indicator	Split up Score	Sub total	Total.
All inorganic, organic substances present in the environment and minerals present in the forest constitute the abiotic component. Biotic component consists of all living things of the environment which constitute producers, consumers and decomposers.			8
VI b) Grasslands are areas where the vegetation is dominated by grasses and other herbaceous plants. Occupy 24% of the earth's surface. Annual rainfall ranges between 25-75cm Types :- 1) Xerophilous grassland 2) Mesophilous grasslands 3) Hygrophilous grass lands. Xerophilous - found in dry regions of North-west india under semi-desert conditions. Mesophilous - It is termed as savannas, typical moist deciduous forest of utter pradesh. Hygrophilous - It is termed as wet savannas and are found in marshy areas.			7
VII a) Two types :- Acute and chronic. Acute :- immediate and short lived. They occur when the victim is exposed to a high concentration of toxic pollutant for a brief period. These result when a pollutant is released in abnormaly large quantities chronic :- Short term exposure for a long period. effects appear after months or years. e.g :- exposure to SO_2 may give rise to chronic bronchitis, pulmonary fibrosis or exposure to coal dust may give rise to black lung.	Expln 7		7

(3000)

Scoring Indicator.

Split up Score.	Sub Total	Total.

VII

6. control measures to prevent water pollution.

1) Preliminary treatment
2) Primary treatment
3) Secondary treatment
4) Tertiary treatment.

Secondary treatment.

1) trickling filtration
2) activated sludge process.

Trickling filtration:- It is a process in which waste water is distributed from rotary nozzles over a tank filled with filter medium consisting of broken stone of size 25 to 75 mm and there is free circulation of air through the medium. The waste water trickles over the surfaces of broken stone and is finally collected through the drainage system at the bottom of the tank. When the sewage starts percolating downwards, the micro organisms present in the sewage starts growing using the organic materials in the sewage as food. On completion of aerobic oxidation, the treated sewage is taken to sedimentation tank and the sludge is removed.

Activated sludge process:- activated sludge is biologically active and has a large population of aerobic bacteria which rapidly oxidize the organic matter. The primary treated water is ~~this~~ ~~this~~ thoroughly mixed with a small quantity of activated sludge in an aeration tank. At this stage the micro organism present in the activated sludge multiply rapidly. As a result, the organic matter present

Scoring Indicator.

Split up score	Sub Total	Total

ai the sewage are rapidly oxidized. After aeration, the sewage is taken to the bottom of the tank. The sludge that settled at the bottom of this tank is activated sludge. A portion of this sludge is used for seeding a fresh batch of sewage.

VIII

a. 1) Identification of waste and its minimization at the source
2) collection, segregation and storage at the site of collection.
3) Transportation
4) Treatment
5) Energy recovery
6) Disposal.
7) Incineration
8) Land fill
9) composting.

Desp expln. 8

7.

b). Any seven points.

IX

a. Causes

1) Heavy rainfall
2) Heavy siltation of the river bed reduces the water carrying capacity of the rivers/stream.
3). Blockage in the drains lead to flooding of the area.
4) Landslides blocking the flow of the stream
5) construction of dams ~~and~~ and reservoirs.

b). Effects

1) Loss of life and property
2). Structures get damaged.
3) Inundation of agricultural land
4). Shortage of food and animal fodder

7.

Q. No:	(3001) Scoring Indicator.	Split up Score.	Sub total	Total.

IX

b. Disaster management comprises of three stages :-
1) Pre disaster Stage
2) Emergency Stage
3) Post-disaster Stage.

Emergency stage :- ① This stage comprises of rescue and evacuation, shelter for victims relief for livestock, disposal of dead and finally damage assessment survey.
② Requires a Rapid Action task force.
3) The team should have the concern and technical knowledge and skills to conduct such operations.
4) Locale people should be trained to handle the emergency situation.
5) Formation of disaster management committee at local level.
6) Responsibilities should be given to National Social service corp, and other voluntary organisations
7) Emergency relief on humanitarian basis and emergency medical ~~care~~ care should be given
8) Relief supplies or services are typically provided free of charge in the days and weeks immediately following a sudden ~~di~~ disaster.

8.

X

a. Hazard :- phenomenon that pose a threat to people, structures or economic assets and which may cause a disaster.
Disaster :- The occurence of a sudden or major misfortune that disrupts the basic fabric or normal functioning of a society.

description + Types

7

Q. No: (3001) Scoring Indicator. | Split up score. | Sub total | Total.

X

b. • Disaster mapping is a tool for analysing, storing and conveying information on the geographical location of a disaster occurrence and spread of the effects or probable effects of disasters.

• The occurrence of such disasters, their intensity, the area of their occurrence and their impacts has to be assessed, so as to have information about the damages caused by them to the area specific or probable damages or impact likely to be caused. 7

• Proper mapping will be helpful not only for pre-disaster preparedness but also in rescue and relief operations with greater accuracy and speed.

• New specialised techniques like GIS are increasingly used for disaster mapping.