SCHEME OF VALUATION

Scoring Indicators

Course : ENVIORNMENTAL SCIENCE & DISASTER MANAGEMENT

Code : 3001

Version : Scheme A

Question No.	Scoring Indicators	Split Score	Sub Total	Total
I 1	Natural resources are the substances which are inherent to earth and obtained from nature and utilized to create products and services which are useful for human beings		2	2
I 2	Ecosystem is a system of living things that interact with each other and with the physical world.	2	2	2
I 3	• Air pollution • Water pollution • Land Pollution • Oil pollution • Marine pollution • Noise pollution • Thermal pollution • Nuclear hazards. **(Any two)**	1 1	2	2
I 4	A disaster can be defined as an occurrence either nature or man made that causes human suffering and creates human needs that victim cannot alleviate without assistance	2	2	2
I 5	clean **water** and **air** ,Timber for wood products ,Wildlife habitats Stable **soil etc (Any two)**	1 1	2	2

II 1	• Resources found in nature that are self-regenerating • Wind , Solar, Hydropower, Biofuels, Geothermal • Nrcessity to avert irreversible climate damage • Inreasing oil prices • Unreliability of Non renewable sources • Even if the itial investment is high running cost is low and effiency is very high etc		6	6
II 2	**Environmental impacts of mining** can occur at local, regional, and global scales through direct and indirect mining practices. Impacts can result in erosion, sinkholes, loss of biodiversity, or the contamination of soil, groundwater, and surface water by the chemicals emitted from mining processes. These processes also have an impact on the atmosphere from the emissions of carbon which have effect on the quality of human health and biodiversity.[Some mining methods may have such significant environmental and public health effects that mining companies in some countries are required to follow strict environmental and rehabilitation codes to ensure that the mined area returns to its original state.	6	6	
II 3	• The occurrence of sequence of communities over a period of time in the same area is termed as ES. • Based on the nature of habitat: primary or secondary. • Primary – begins in a place without soil • Secondary – where soil already exists • Based on the types of organisms. • Autotrophic Succession • Heterotrophic Succession • Process of sucession 1. Nudation 2. Invasion	2 1 1 2	6	6

	3. Migration 4. Colonisation 5. Ecesis 6. Aggregation 7. Competition and reaction Climax or stabilization			
II 4	❑ According to the USEPA, there are direct links between noise and health. Also, noise pollution adversely affects the lives of millions of people. ❑ Noise pollution can damage physiological and psychological health. ❑ High blood pressure, stress related illness, sleep disruption, hearing loss, and productivity loss are the problems related to noise pollution. ❑ It can also cause memory loss, severe depression, and panic attacks.	1.5 1.5 1.5 1.5	6	6
II 5	Disasters and development are closely linked. Disasters can both destroy development initiatives and create development opportunities. Development schemes can both increase and decrease vulnerability In the traditional approach to disasters, the attitude was that the disasters, especially natural ones, were an act of god and as such were beyond control; accepting death and damage to property was part of the costs. With such an attitude, most development plans were designed withoutconsideration for the effect disasters would have on community plans and vice versa. When a disaster did occur, the response was directed at meeting emergency needs and cleaning up. n the current approach, it has been realized that much more can and need to be done to reduce the severity of hazards and disasters. A	6	6	6

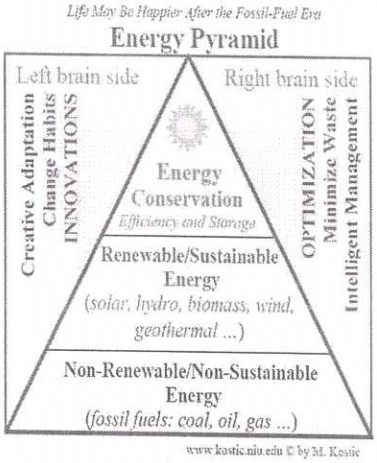
	growing body of knowledge on the relationships between disasters and development indicates four basic themes as follows: Disasters set back development programming, destroying years of development initiatives. Rebuilding after a disaster provides significant opportunities to initiate development programmes. Development programmes can increase an area's susceptibility to disasters. Development programmes can be designed to decrease the susceptibility to disasters and their negative consequences			
II 6	Causes of the Food Crisis. Increased demand on the food supply has caused the price of food to rise. The numerous contributors to the rise in cost and the reduction in supply include biofuels, bad weather, the historically high cost of oil and transportation, increased demand for meat and dairy, and population growth Critical factors behind every food crisis Poverty Drought and Desertification Political Pressure Increased Consumption of Meat and Dairy Increased Oil and Transportation Costs Falling World Aid International Conflicts Disease	6	6	6

II 7	The members of biotic components of an ecosystem are grouped in to three based on how they get food. • Producer • Consumer • Decomposers • **1.Procedures** • Procedures synthesize their food themselves through photosynthesis • **Example :** • All green plants, trees. • **2. Consumers** • **Plant eating species** • Insects, rabbit, goat, deer, cow, etc., • **Classification of consumers** • Consumers are further classified as • (i) **Primary consumers** • **ii) Secondary consumers** • **(iii) Tertiary consumers** • **3. Decomposers** • Microorganisms like bacteria and fungi. Decomposers attack the dead bodies of producers and consumers and decompose them into simpler compounds. During the decomposition inorganic nutrients are released. • The inorganic nutrients together with other organic substances are then utilized by the procedures for the • synthesis of their own food.	1.5 1.5 1.5 1.5	6	6

III a	**Impacts** Erosion of topsoil Floods Extinction of plants and animals Local climatic change Global warming **Effects** Loss of livelihood of local communities Large scale of destruction of forests leads to a number of adverse environmental effects. • Loss of natural habitat of wild animals and plants • Increased intensity and frequency of natural disasters • Land Degradation • Loss of forest products • Change in climatic conditions • Siltation of rivers and canals • Loss of revenue • Change in water cycle and reduced rainfall • Increase socio economic problems **Brief explanation**	8	8	15
III b	**nergy conservation** plays a very **important** role because utilization of non-renewable resources also impacts our environment. Specially, usage of fossil fuels supplies to air and water pollution such as carbon dioxide is produced when oil, coal and gas combust in power stations, heating systems, and engines of car. **onserving energy** not only helps to **conserve resources** but also translates into financial savings. It is **important** to **conserve energy**	3	7	

	resources because once we use them all then it will become difficult to find them or they are completely exhausted and it becomes history for us that once we used **Few points – Need to m*ention any 4 from this*** We use energy faster than it can be produced - Coal, oil and natural gas - the most utilised sources take thousands of years for formation. Energy resources are limited - India has approximately 1% of world's energy resources but it has 16% of world population. Most of the energy sources we use cannot be reused and renewed - Non renewable energy sources constitute 80% of the fuel use. It is said that our energy resources may last only for another 40 years or so. We save the country a lot of money when we save energy - About 75 per cent of our crude oil needs are met from imports which would cost about Rs.1, 50,000 crore a year We save our money when we save energy - Imagine your savings if your LPG cylinder comes for an extra week or there is a cut in your electricity bills We save our energy when we save energy - When we use fuel wood efficiently, our fuel wood requirements are lower and so is our drudgery for its collection Energy saved is energy generated - When we save one unit of energy, it is equivalent to 2 units of energy produced Save energy to reduce pollution - Energy production and use account to large proportion of air pollution and more than 83 percent of greenhouse gas emissions An old Indian saying describes it this way - The earth, water and the air are not a gift to us from our parents but a loan from our children. Hence we need to make energy conservation a habit.	4		
IV a	**Land - The solid portion of the earth's surface'** **Land is considered** an important **resource** because it is being used by human beings for several purposes such as agriculture, forestry, mining, building houses and roads, and setting up industries. Also, it provides habitation to a variety of flora and fauna. Hence, it is among the most important **natural resources** ***Prevention and Control Measures for Land Degradation:***	3 7	10	15

	Following are some practises for controlling land degradation: **1. Strip farming:** It is & practice in which cultivated crops are sown in alternative strips to prevent water movement. **2. Crop Rotation:** It is one of the agricultural practice in which different crops are grown in same area following a rotation system which helps in replenishment of the soil. **3. Ridge and Furrow Formation:** Soil erosion is one of the factors responsible for lad degradation. It can be prevented by formation of ridge and furrow during irrigation which lessens run off. **4. Construction of Dams:** This usually checks or reduces the velocity of run off so that soil support vegetation. **5. Contour Farming:** This type of farming is usually practiced across the hill side and is useful in collecting and diverting the run off to avoid erosion.			
IV b	Use recyclable resources like reuse paper page and encourage recycling. Use alternative energy sources such as solar energy for domestic heating Make equitable use of water for personal and domestic purposes. Through better use and maintenance of non-maintainable resource. Prefer to use renewable and non-conventional energy sources.	5	5	
V a	Ecological pyramid - Graphical representation of structure and function	9	3	15

	of tropic levels of an ecosystem, starting with producers at the bottom and each successive tropic levels forming the apex is known as an ecological pyramids Types of Ecological pyramids 1. Pyramid of numbers. 2. Pyramid of energy. 3. Pyramid of biomass. – Explaination of 3 and figure of any one  	6		
V b	**Biomagnification**, also known as **bioamplification** or **biological magnification**, is any concentration of a toxin, such as pesticides, in the tissues of tolerant organisms at successively higher levels in a food chain. This increase can occur as a result of: • Persistence – where the substance cannot be broken down by environmental processes • Food chain energetics – where the substance's concentration increases progressively as it moves up a food chain • Low or non-existent rate of internal degradation or excretion of the substance – mainly due to water-insolubility •	3	6	

	ffects of Biomagnification Humans become more susceptible to cancers, liver and kidney failure, respiratory disorders, birth defects in pregnant women, brain damage, and heart diseases are a result of mercury, cadmium, lead, cobalt, chromium and other chemical poisoning.	3		
VI a	▸ Deserts are very dry ecosystems. ▸ Desert plants and animals can survive with very little water. Desert ecosystem occupies about 35% of our world's land area. It is characterized by less than 25 cm rainfall. The atmosphere is dry and hence it is a poor insulator **Types of desert ecosystems** Based on the climatic conditions, deserts are classified three types. 1. Tropical deserts. 2. Temperate deserts. Cold deserts. **Features of different types of deserts** 1. Tropical deserts: Tropical deserts are found in • Africa: Sahara desert. • Rajasthan: Thar desert. They are characterized by only few species. Wind blow sand dunes are very common. 2. Temperate deserts They are found in South California: Majave. They are characterized by very hot summer and very Winter time.	2 3 4	9	15

3. Cold deserts They are found in -

China: Gobi desert.

Characteristics of Desert ecosystem

The desert air is dry and the climate is hot. Annual rainfall is less than 25 cm. The soil is very poor in nutrients and organic matter, Vegetation is poor.

Structure and functions of the desert systems ecosystems

1. Abiotic Components

Examples : Temperature, rainfall, sunlight, water, etc.,

The temperature is very high and the rainfall is very low. The nutrient cycling is also very low.

Biotic Components

Procedures

Examples : Shrubs, bushes, some grasses and few trees .In deserts mostly Succulent (e.g., cacti) plants are found available. They have water inside them to stay alive. They have. r on the outside to protect them from the sun.

Consumers

Examples : Squirrels, nice foxes, rabbits, deer and reptiles. These animals dig holes in the ground to live in. They come out at night to find food. Most of the animals can extract water from the seeds they eat.

Decomposers

Examples : Fungi and bacteria

Desert has poor vegetation with a very low amountof dead organic mater. They are decomposed by few fungi and bacteria.

VI b	Fossil fuels Deforestation Intensive farming Waste Disposal Mining Over consumption	5	5	
VII a	**It is an undesirable change in the physical , chemical or biological characteristics of air . Air pollution is cause due to an increase in the content of harmful substances in air such as oxides of nitrogen, sulphor etc** **Factors contributing to Air pollution** **Air pollutants** like ozone, particulate matter, carbon monoxide, nitrogen oxide, sulfur dioxide, lead cause **atmospheric pollution** which regards to ozone depletion, GH effect, climate change and human health effects. **An air pollutant** is a material in the air that can have adverse effects on humans and the ecosystem. The substance can be solid particles, liquid droplets, or gases. A pollutant can be of natural origin or man-made. Pollutants are classified as primary or secondary. Primary pollutants are usually produced by processes such as ash from a volcanic eruption. Other examples include carbon monoxide gas from motor vehicle exhausts or sulphur dioxide released from factories. Secondary pollutants are not emitted directly. Rather, they form in the air when primary pollutants react or interact. Ground level ozone is a prominent example of secondary pollutants. Some pollutants may be both primary and secondary: they are both emitted directly and formed from other primary pollutants	8 5	8	15

- Two categories
  - Primary Air Pollutant
    - Harmful substance that is emitted directly into the atmosphere
  - Secondary Air Pollutant
    - Harmful substance formed in the atmosphere when a primary air pollutant reacts with substances normally found in the atmosphere or with other air pollutants
- **he common air pollutants are:**
- Particulate matter (PM10 and PM2.5)
- Ozone (O3)
- Carbon dioxide (Co2)
- Nitrogen dioxide (NO2)
- Carbon monoxide (CO)
- Sulphur dioxide (SO2)
- Volatile organic compounds (VOC)
- Persistent free radicals
- Chlorofluorocarbons (CFCs)

Secondary pollutants

- Particulates created from gaseous primary pollutants and compounds in photochemical smog. Smog is a kind of air pollution.
- Ground level ozone (O_3) formed from NO_x and VOCs. Ozone (O_3)
- Peroxyacetyl nitrate ($C_2H_3NO_5$) – similarly formed from NO_x and VOCs.

VII b	1. DO NOT pour fat from cooking or any other type of fat, oil, or grease down the sink. Keep a "fat jar" under the sink to collect the fat and discard in the solid waste when full. 2. DO NOT dispose of household chemicals or cleaning agents down the sink or toilet. Simsbury has a Hazardous Waste Collection day usually from 8:00am to 1:00pm at Henry James School. Connecticut Resource Recovery Authority lists all collection dates. 3. DO NOT flush pills, liquid or powder medications or drugs down the toilet. For recommendations on proper disposal for all types of medical wastes, visit the CT DEP publication here. 4. Avoid using the toilet as a wastebasket. Most tissues, wrappers, dust cloths, and other paper goods should be properly discarded in a wastebasket. The fiber reinforced cleaning products that have become popular should never be discarded in the toilet. 5. Avoid using a garbage disposal. Keep solid wastes solid. Make a compost pile from vegetable scraps. 6. Install a water efficient toilet. In the meantime, put a brick or 1/2 gal container in the standard toilet tank to reduce water use per flush. 7. Run the dishwasher or clothes washer only when you have a full load. This conserves electricity and water. 8. Use the minimum amount of detergent and/or bleach when you are washing clothes or dishes. Use only phosphate free soaps and detergents. 9. Minimize the use of pesticides, herbicides, fertilizers. DO NOT dispose of these chemicals, motor oil, or other automotive fluids into the sanitary sewer or storm sewer systems. Both of them end at the river. 10. If your home has a sump pump or cellar drain, make certain it does not drain into the sanitary sewer system. If you are unsure, please call Simsbury Water Pollution Control at (860) 658-1380 and we can assist in determining the discharge point. **Mention any 5**	7 4	7	

VIII a	❑ **Noise pollution is excessive, displeasing human, animal, or machine-created environmental noise that disrupts the activity or balance of human or animal life.** ❑ **According to the USEPA, there are direct links between noise and health. Also, noise pollution adversely affects the lives of millions of people.** ❑ **Noise pollution can damage physiological and psychological health.** ❑ **High blood pressure, stress related illness, sleep disruption, hearing loss, and productivity loss are the problems related to noise pollution.** ❑ **It can also cause memory loss, severe depression, and panic attacks.** ❑	7 4	7	15
VIII b	**Environmental Impact Assessment** (EIA) is a process of evaluating the likely environmental impacts of a proposed project or development, taking into account inter-related socio-economic, cultural and human-health impacts, both beneficial and adverse. he purpose of the **EIA process** is to inform decision-makers and the public of the environmental consequences of implementing a proposed project. The **EIA** document itself is a technical tool that identifies, predicts, and analyzes impacts on the physical environment, as well as social, cultural, and health impacts. **Ned** It is is necessary today when it was not in the past: modern society's have a faster, more widespread and larger impact on the natural environment. the individualism of modern societies requires legal controls to replace traditional community control. - Potentially screens out environmentally-unsound projects - Proposes modified designs to reduce environmental impacts - Identifies feasible alternatives - Predicts significant adverse impacts - Identifies mitigation measures to reduce, offset, or eliminate major impacts - Engages and informs potentially affected communities and	3 5	8	

	individuals - Influences decision-making and the development of terms and conditions			
IX a	Disaster management aims to reduce, or avoid, the potential losses from hazards, assure prompt and appropriate assistance to victims of disaster, and achieve rapid and effective recovery. The Disaster management cycle illustrates the ongoing process by which governments, businesses, and civil society plan for and reduce the impact of disasters, react during and immediately following a disaster, and take steps to recover after a disaster has occurred. Appropriate actions at all points in the cycle lead to greater preparedness • Mitigation - Minimizing the effects of disaster. Examples: building codes and zoning; vulnerability analyses; public education. • Preparedness - Planning how to respond. Examples: preparedness plans; emergency exercises/training; warning systems. • Response - Efforts to minimize the hazards created by a disaster. Examples: search and rescue; emergency relief . • Recovery - Returning the community to normal. Examples: temporary housing; grants; medical care.	15	15	15
IX b	**ransport Emergency Cards (TREM Cards)** are **cards** that workers carry **at** all times when their work **involves transporting hazardous** wastes. ... **TREM Cards** carry information about the particular **goods** being **transported** and provide instructions to the driver or emergency responders in the event of an incident. REM Cards list the nature of the carried substances, associated hazard(s), and what actions should be taken in the event of an emergency. They also include a contact name and telephone number for			

	the relevant emergency services in the event of an accident. Transport Emergency Cards must be visible in the vehicle at all times during the transportation of hazardous substances. Upon delivery, TREM Cards are removed from view. The consignor is required under regulations to either supply the cards or give enough information for the operator to obtain the correct ones. However, the carrier also has a legal obligation to ensure that cards are appropriate to the load.			
X a	A hazard is natural event while the disaster is its consequence. A hazard is perceived natural event which threatens both life and propert A disaster is a realization of this hazard Vulnerability describes the characteristics and circumstances of a community, system or asset that make it susceptible to the damaging effects of a hazard. There are many aspects of vulnerability, arising from various physical, social, economic, and environmental factors.. **Vulnerability = Exposure + Resistance + Resilience** Exposure: at risk property and population Resistance: Measures taken to prevent, avoid or reduce loss Resilience: Ability to recover prior state or achieve desired post- disaster state **Risk** The probability that a community's structure or geographic area is to be damaged or disrupted by the impact of a particular hazard, on account of their nature, construction, and proximity to a hazardous area. Risk is a function of threats exploiting vulnerabilities to obtain, damage or destroy assets. Thus, threats (actual, conceptual, or inherent) may exist, but if there are no vulnerabilities then there is little/no risk. **Relationship Between Risk & Vulnerability** • 'Risk' is essentially the level of possibility that an action or activity will lead to lead to a loss or to an undesired outcome, when 'vulnerability' is a weakness that makes one susceptible to an attack, a loss or an undesired outcome.	8	8	15

	Hazard : potential threat to humans and their welfare + **vulnerability : exposure and susceptibility to losses** = **risk : probability of hazard occurrence** **disaster : realization of a risk**				
X b	The disaster management act 2005 National Policy on disaster Management (NPDM) 2009 eetc ***Explain any two briefly***		7	7	

CODE: 3001

COURSE: Environmental Science & Disaster Management. VERSION: 2015.

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Sl No.	Module	Type of Questions							
		Part A		Part B		Part C		Total	
		No. of Questions	Score	No. of Questions	Score	No. of Questions	Score	No. of Questions	Score
1	1st Module	2	4	3	18	4	30	9	52
2	IInd module	1	2	2	12	4	30	7	44
3	IIIrd module	1	2	1	6	4	30	6	38
4	IVth Module	1	2	1	6	4	30	6	38
Total		5	10	7	42	16	180	28	172

QUESTION WISE ANALYSIS

COURSE :

VERSION :

Qn No.	Specific outcome (as per syllabus)	Module	Content Details	Score	Time in Minutes
I 1	1.1.0	1	Natural Resources	2	2
2	2.1.1	2	Eco Systems	2	2
3	3.1.1	3	Environmental Pollution	2	2
4	4.1.1	4	Disaster	2	2
5	1.1.1	1	Forest Resources	2	2
II 1	1.1.22	1	Renewable Energy	6	8
2	1.1.13	1	Mining	6	8
3	2.1.6	2	Ecological Succession	6	8
4	3.1.22	3	Noise Pollution	6	8
5	4.1.13	4	Disaster & Development	6	8
6	1.1.15	1	Food Resources.	6	8
7	2.1.3	2	Eco system	6	8
III a	1.1.4	1	De forestation	8	17
III b	1.1.23	1	Energy Conservation	7	13
IV a	1.1.25	1	Land resources	10	20
b	1.1.30	1	Conservation of Resources	5	10
V a	2.1.9	2	Ecological Pyramid	9	18
b	2.1.10	2	Bio magnification	6	12
VI a	2.1.13	2	Desert Eco System	10	20
b	2.1.16	2	Global warming	5	10
VII a	3.1.2	3	Air Pollution	8	16
b	3.1.10	3	Control water Pollution	7	14
VIII a	3.1.22	3	Noise Pollution	7	14
VIII b	3.1.34	3	EIA	8	16
Total Time					

QUESTION WISE ANALYSIS

COURSE :

VERSION :

Qn No.	Specific outcome (*as per syllabus*)	Module	Content Details	Score	Time in Minutes
IX a	4.1.9	4	Disaster Management	10	20
IX b	4.1.22	4	TREM- Hazard Mns.	5	10
X a	4.1.2	4	Relation. Disaster, Risk.	8	16
X b	4.1.24	4	Actr- Disaster Measurement	7	14.
Total Time					180 minutes.

(Excluding choices)