Set-B

KOLHAPUR INSTITUTE OF TECHNOLOGY'S,
COLLEGE OF ENGINEERING (AUTONOMOUS), KOLHAPUR
(AFFILIATED TO SHIVAJI UNIVERSITY, KOLHAPUR)

S.Y. B.Tech. (Mechanical Engineering)

(Semester- IV)

END SEMESTER EXAMINATION, AUGUST- 2022

Course Code : **UBIO0461,UELE0461 & UMCH0461**

Course Name : **Environmental Studies (Audit Course)**

Day and Date : **Friday , 12-Aug-2022** **PRN :**

Time : **10:00 To 01:00** **Max Marks: 100**

Instructions:

IMP: Verify that you have received question paper with correct course, code, branch etc.

i) All questions are compulsory.
ii) Figure to the right indicate full marks.
iii) Assume suitable data wherever necessary.

		Marks	B.L	CO's
Q.1	**Multiple Choice Questions**	**40**		
1	Conservation of biodiversity in their natural habitats is called a) Ex-situ conservation b) In-situ conservation* c) Protected conservation d) Stabilized conservation		2	CO1
2	Which gas is responsible for depletion of ozone layer? a) Chlorofluorocarbon* b) Nitrogen c) Oxygen d) Nitrogen Oxide		4	CO3
3	The final stable community in ecological succession is… a) Climax* b) Pioneer c) Rare d) Carnivores		2	CO1
4	Biomedical wastes are treated by using a) Incinerators * b) Water treatment c) Cyclones d) Land fills		2	CO2
5	Noise pollution means a) Loud sound b) Unwanted sound c) High frequency sound Enrichment of plant nutrients in water bodies		2	CO2

	d) Environmental pollution			
6	Ozone layer is present in…. e) Troposphere f) Mesosphere g) Thermosphere d) Stratosphere *		4	CO3
7	Hotspots are regions of high…. a) Rareism b) Endemism c) Diversity d) Critically endangered population		2	CO1
8	The Water pollution (Prevention and control of pollution) act was enacted in year…. a) 1981 b) 1986 c) 1974* d) 1972		4	CO4
9	Bhopal gas tragedy occurred due to the leakage of a) Mustard gas b) Methane gas c) Sulphur dioxide d) Methyl Isocyanate*		4	CO4
10	The estimated percentage of the forest land that ideally India should have: a) 50% b) 15% c) 33%* d) 44%		4	CO4
11	Smog is combination of…. a) Smoke and snow b) Snow and fog c) Smoke and fog* d) All the above		2	CO2
12	Recycled water can be used for a) Crop irrigation b) Landscape gardening c) Replenishing fast depleting aquifers d) All of these*		2	CO2
13	Word "Environment" is derived from a) Italy b) French* c) German d) English		4	CO3
14	Which state has made it compulsory to harvest rain water for all building? a) Rajasthan		4	CO3

	b) West Bengal c) Tamilnadu* d) Maharashtra			
15	Abiotic environment does not include ------ a) Soil b) Water c) Air d) Plant*		2	CO1
16	Energy obtained from the Earth's hot interior is called the…. a) Geo-Thermal energy* b) Thermal energy c) Biomass energy d) None of these		2	CO1
17	Eutrophication means…. a) Water purification b) Neutralization of waste water c) Waste water Treatment process d) Enrichment of plant nutrients in water bodies*		2	CO2
18	'World Environmental Day 'is celebrated every year on: a) 5^{th} May b) 5^{th} June* c) 5^{th} July d) 18^{th} July		4	CO3
19	The main driving force of ecological system is ----- a) Wind energy. b) Water energy c) Solar energy* d) Earth Energy		2	CO1
20	Why biodiversity valuable and desirable to humans? a) For medical purpose b) For agricultural diversity c) For consumptive use d) All of these*		2	CO1
Q.2	**Attempt any one.**	**10**		
A	What are natural resources? Give types of natural resources and discuss Food resources as a natural resource.		2	CO1
B	Give salient features of Water (Prevention and control of pollution Act, 1974)		4	CO4
Q.3	**Attempt any one.**	**10**		
A	Give sources, effects and control measures of Water pollution		2	CO2
B	What is the need for public awareness? Give its methods.		4	CO3
Q.4	**Attempt any one.**	**10**		
A	Explain in detail methods for conservation of Biodiversity with examples.		2	CO1
B	Write in detail structure and function of forest ecosystem.		2	CO1

Q.5	**Write short note on any five:**	**30**		
A	Hotspots of Biodiversity		2	CO2
B	Urban Problems related to energy		4	CO3
C	Role of an individual in pollution prevention		2	CO2
D	Ozone layer depletion		4	CO3
E	Disaster management for Landslides		4	CO3
F	Values of biodiversity		2	CO1
G	Food Chain and Food web with Example		2	CO1

Q2. A)

Natural resources are materials or substances that occur naturally in the environment and are valuable to humans for various purposes. They can be categorized into two main types:

1) Renewable Resources: These resources can be replenished or regenerated naturally within a relatively short period of time. Examples include sunlight, wind energy, water (hydroelectric power), timber, and agricultural crops.

2) Non-renewable Resources: These resources exist in limited quantities and cannot be easily replenished within a human lifespan. They include fossil fuels like coal, oil, and natural gas, as well as minerals such as gold, silver, iron, and uranium. Non-renewable resources are formed over millions of years and are depleting faster than they can be naturally replenished.

Water Resources: Water is essential for all forms of life, and it is a vital resource for human activities such as drinking, irrigation, and industrial processes. It includes freshwater bodies like rivers, lakes, and underground aquifers.

Forest Resources: Forests are valuable resources that provide timber, wood products, and non-timber forest products. They also play a significant role in maintaining biodiversity, regulating climate, and providing habitat for wildlife.

Mineral Resources: Minerals are naturally occurring substances found in the Earth's crust. They are used in various industries, such as construction, manufacturing, and energy production. Examples include coal, iron ore, copper, and gold.

Food Resources: Food resources refer to the various agricultural products and edible plants and animals that serve as a source of nutrition for humans.

Food Resources:

- Food resources refer to the various agricultural products and edible plants and animals that serve as a source of nutrition for humans.
- Natural or artificially produced materials, which are used as food to derive metabolic energy, are called as food resources.
- Food refers to any substance that is Ingested utilized by the body for growth of life.
- They are a critical component of natural resources and are essential for the sustenance of life.
- Food resources encompass a wide range of items, including staple crops like wheat, rice, corn, and potatoes, as well as fruits, vegetables, livestock, poultry, fish, and seafood.
- Food resources also include non-conventional sources such as edible insects and algae, which are gaining attention as sustainable alternatives.
- Food resources are crucial for human survival, health, and well-being. They provide the necessary nutrients, vitamins, and minerals required for the proper functioning of our bodies.
- The availability and access to food resources can be influenced by various factors such as climate, soil fertility, water availability, agricultural practices, infrastructure, distribution systems, and socioeconomic conditions.

Causes of Food Problem:
Increased Population.
Unfavourable Climate.
Adverse geographical conditions.
Infertile soil.
Disasters
Lack of transportation.
High Cost of grains.

Sustainable Agriculture:

- Method of growing crops and raising livestock based on organic fertilizers, soil conservation, water conservation, biological control of pests, and minimal use of non-renewable fossil fuel energy.
- Sustainable agriculture consists of environment friendly methods of farming that allow the production of crops or livestock without damage to human or natural systems.
- Elements of sustainable agriculture can include organic farming, agro forestry, mixed farming, natural farming, precision farming, multiple cropping, and crop rotation.

Q2. B)

1. **Objective**: The primary objective of the Act is to prevent and control water pollution by regulating and controlling the discharge of pollutants into water bodies, and to maintain or restore the wholesomeness of water.
2. **Central and State Pollution Control Boards**: The Act establishes the Central Pollution Control Board (CPCB) at the central level and State Pollution Control Boards (SPCBs) at the state level. These bodies are responsible for implementing the provisions of the Act, granting consent for water pollution control, monitoring water quality, and enforcing the law.
3. **Consent for Polluting Activities**: The Act requires any person, industry, or organization that intends to discharge any pollutants into water bodies to obtain prior consent from the respective pollution control board. The boards may grant or refuse consent and impose conditions to regulate the discharge of pollutants.
4. **Prohibition on Pollution**: The Act prohibits the discharge of pollutants beyond the prescribed standards into water bodies. It sets standards for different types of pollutants and empowers the pollution control boards to specify and enforce these standards.
5. **Powers of the Pollution Control Boards**: The Act provides extensive powers to the pollution control boards, including the power to inspect premises, collect samples, issue directions, conduct inquiries, and take appropriate actions against violators.
6. **Penalties and Offenses**: The Act specifies penalties and punishment for various offenses related to water pollution. It includes fines, imprisonment, or both, depending on the severity of the offense. Repeat offenders may face higher penalties.
7. **Polluter Pays Principle**: The Act incorporates the "polluter pays" principle, which means that the person or entity responsible for causing water pollution is liable to bear the costs of remedial measures, including restoration and compensation.
8. **Environmental Laboratories**: The Act provides for the establishment and recognition of environmental laboratories for analyzing water samples and monitoring water quality.
9. **River Basin Authorities**: The Act empowers the central government to establish River Basin Authorities to plan and implement comprehensive pollution control measures for inter-state river basins.
10. **Public Participation**: The Act encourages public participation in matters related to the prevention and control of water pollution. It allows interested individuals and organizations to file complaints, seek information, and participate in hearings and inquiries.

Q3. A)

Water pollution refers to the contamination of water bodies, such as lakes, rivers, oceans, and groundwater, by various pollutants. These pollutants can have detrimental effects on aquatic ecosystems, human health, and the environment as a whole. Here are some sources, effects, and control measures of water pollution:

Sources of Water Pollution:

1. Industrial Discharges: Wastewater containing harmful chemicals and heavy metals from industrial processes.
2. Agricultural Activities: Runoff of pesticides, fertilizers, and animal waste from agricultural lands into nearby water bodies.
3. Municipal Wastewater: Discharge of untreated or inadequately treated sewage from cities and towns.
4. Oil Spills: Accidental release of crude oil or petroleum products into water bodies, often due to maritime accidents or industrial mishaps.
5. Landfills and Dumping: Improper disposal of solid waste, including plastics and other non-biodegradable materials, leading to leachate contamination.
6. Mining Activities: Discharge of toxic substances and heavy metals from mining operations into nearby water bodies.
7. Construction Sites: Sediment runoff, cement, and chemical spills from construction activities.
8. Atmospheric Deposition: Airborne pollutants, such as acid rain, can settle on water surfaces and contaminate them.

Effects of Water Pollution:

1. Ecosystem Disruption: Water pollution can harm aquatic plants, animals, and microorganisms, disrupting the balance of ecosystems and causing biodiversity loss.
2. Drinking Water Contamination: Polluted water can contain pathogens, heavy metals, and other toxic substances, posing risks to human health if consumed without proper treatment.
3. Harm to Marine Life: Pollutants can accumulate in the tissues of fish and other marine organisms, leading to reproductive issues, growth abnormalities, and even death.

4. Loss of Recreational Opportunities: Contaminated water bodies may become unsuitable for swimming, boating, and other recreational activities, impacting tourism and local economies.
5. Economic Impact: Water pollution can affect fisheries, agriculture, and industries reliant on clean water, leading to financial losses and decreased productivity.
6. Groundwater Contamination: Pollutants can seep into groundwater, a vital source of drinking water, potentially rendering it unsafe for consumption.

Control Measures for Water Pollution:

1. Wastewater Treatment: Implementing effective treatment systems for industrial and municipal wastewater before discharge.
2. Environmental Regulations: Enforcing strict laws and regulations to control pollutant discharges and promote responsible waste management practices.
3. Pollution Prevention: Encouraging industries to adopt cleaner production processes, reduce the use of hazardous substances, and implement recycling and waste reduction measures.
4. Agricultural Best Practices: Promoting the use of organic farming methods, proper fertilizer management, and erosion control measures to minimize agricultural runoff.
3) Oil Spill Response: Developing and implementing emergency response plans, improving oil transportation safety measures, and promoting effective cleanup techniques.
4) Public Awareness and Education: Educating communities about the importance of water conservation, proper waste disposal, and individual actions to prevent pollution.
5) Monitoring and Research: Regular monitoring of water quality, conducting research on emerging pollutants, and improving pollution assessment techniques.

Q4. A)

- The term biodiversity refers to the variety of life on earth at all its levels from genes to ecosystems and the ecological and evolutionary process that sustain it.

- It includes not only species we consider rare, threatened or endangered, but every living thing
- Biodiversity includes diversity within species, between species and of ecosystems

Conservation of biodiversity refers to the efforts made to protect and preserve the variety of life on Earth.

In-Situ conservation
Ex-Situ conservation

In-situ conservation is the conservation of flora and fauna, particularly wild, in their natural habitats
Traditional concepts in India like “(Wildlife sanctuary)” and “(Sacred groves)“
On site conservation
Protecting endangered animals in its natural habitat.

The ex-situ conservation of plants and animals is being carried out as a last alternative to in-situ conservation
Ex-Situ Conservation is the preservation of components of biological diversity outside their natural habitats
Off Site conservation

methods for conserving biodiversity, along with examples:

1. Protected Areas and National Parks: Establishing protected areas and national parks is one of the primary methods for conserving biodiversity. These areas are legally protected from human activities that can harm the environment. Examples include the Yellowstone National Park in the United States, Serengeti National Park in Tanzania, and the Great Barrier Reef Marine Park in Australia.
2. Wildlife Corridors: Creating wildlife corridors involves establishing connectivity between fragmented habitats to allow the movement of species. By enabling animals to migrate, forage, and reproduce, wildlife corridors help maintain genetic diversity and enhance the resilience of ecosystems. An example is the Yungas Corridor in Argentina, which connects different protected areas and allows the movement of jaguars and other species.
3. Habitat Restoration: Restoring degraded habitats is vital for conserving biodiversity. This method involves rehabilitating ecosystems that have been damaged or destroyed, often through reforestation, wetland restoration, or

coral reef rehabilitation. For instance, the restoration of the Atlantic Forest in Brazil aims to recover the highly diverse native vegetation that has been greatly reduced due to deforestation.

4. Sustainable Land Use and Resource Management: Promoting sustainable land use practices is crucial for conserving biodiversity. This includes techniques such as sustainable agriculture, agroforestry, and sustainable forestry. By minimizing habitat destruction, reducing chemical inputs, and promoting responsible resource extraction, these practices help protect biodiversity. The Fairtrade certification system, which ensures fair prices and sustainable production for farmers, is an example of promoting sustainable agriculture.
5. Species Reintroduction and Ex Situ Conservation: Species reintroduction programs involve releasing captive-bred or rehabilitated animals back into their natural habitats. This approach helps restore populations of endangered or locally extinct species. An example is the successful reintroduction of the California condor, one of the world's most endangered birds, into the wild through captive breeding programs. Ex situ conservation involves maintaining species in controlled environments such as botanical gardens, zoos, or seed banks to prevent extinction and aid in their recovery.
6. International Agreements and Policies: International agreements and policies play a crucial role in conserving biodiversity. The Convention on Biological Diversity (CBD), for instance, promotes the conservation and sustainable use of biodiversity at a global level. The CBD has led to the establishment of protected areas, the implementation of sustainable development practices, and the adoption of regulations to combat illegal wildlife trade.
7. Public Awareness and Education: Raising public awareness about biodiversity conservation is vital for generating support and encouraging sustainable practices. Educational programs, public campaigns, and community engagement activities help foster an understanding of the importance of biodiversity and inspire action. For example, World Wildlife Fund (WWF) campaigns, such as Earth Hour, aim to mobilize individuals and communities to take steps towards conservation.

Q4. B)

The forest ecosystem has two parts:

- The non-living or abiotic aspects of the forest: The type of forest depends upon the abiotic conditions at the site. Forests on mountains and hills differ from those along river valleys. Vegetation is specific to the amount of rainfall

and the local temperature which varies according to latitude and altitude. Forests also vary in their plant communities in response to the type of soil.

- The living or the biotic aspects of the forest: The plants and animals form communities that are specific to each forest type. For instance, coniferous trees occur in the Himalayas. Mangrove trees occur in river deltas. Thorn trees grow in arid areas. The snow leopard lives in the Himalayas while the leopard and tiger live in the forests of the rest of India.
- The biotic component includes both the large (macrophytes) and the microscopic plants and animals.
- Plants include the trees, shrubs, climbers, grasses, and herbs in the forest. These include species that flower (angiosperms), and non-flowering species (gymnosperms) such as ferns, bryophytes, fungi and algae.
- The animals include species of mammals, birds, reptiles, amphibians, fish, insects and other invertebrates and a variety of microscopic animals.
- As the plant and animal species are closely dependent on each other, together they form different types of forest communities.
- Man is a part of these forest ecosystems and the local people depend directly on the forest for several natural resources that act as their life support systems.
- People who do not live in the forest buy forest products such as wood and paper, which has been extracted from the forest. Thus, they use forest produce indirectly from the market.

Functions of Forest Ecosystem

Forest utilisation: Natural forests provide local people with a variety of products if the forest is used carefully. Over-exploitation for fuel wood or timber, and conversion to monoculture plantations for timber or other products, impoverishes local people as the economic benefit goes to people who live elsewhere. The entire resource base on which local people have traditionally survived for generations, is rapidly destroyed. Eventually the forest is completely degraded.

Forest products that are collected by people include food such as fruit, roots, herbs and medicinal plants. People depend on fuelwood to cook food, collect fodder for domestic animals, cut building material for housing, collect medicinal plants that have been known for generations for several ailments and use a variety of non-timer forest products such as fiber, cane, gum, to make household articles. Wood from different species of trees have special uses. For instance, a soft wood is used for the yok of a bullock cart while a very hard wood is used for
its axil.

Forest services include the control of the flow of water in streams and rivers. Forest cover reduces surface runoff of rainwater and allows ground water to be stored. Forests prevent erosion of soil. Once soil is lost by erosion, it can take thousands of years to reform. Forests regulate local temperature. It is cooler and more moist

under the shade of the trees in the forest. Most importantly, forests absorb carbon dioxide and release oxygen that we breathe.

Q5. A)

- Hotspots of biodiversity are regions characterized by exceptionally high levels of species richness and endemism (the presence of species found nowhere else in the world).
- These areas are considered to be of utmost importance for conservation efforts due to their unique and irreplaceable ecological value.
- Hotspots of biodiversity are specific geographical areas that harbor a tremendous diversity of plant and animal life. These regions are often characterized by a combination of factors such as favourable climate, diverse habitats, and evolutionary history, which have allowed for the development of a wide array of species.
- There are three levels of biodiversity
    - Genetic diversity - Diversity of genes within a species i.e. genetic variability among the populations and the individuals of the same species.
    - Species diversity - Diversity among species in an ecosystem "Biodiversity hotspots" are excellent examples of species diversity
    - Ecosystem diversity Diversity at a higher level of organization, the ecosystem to do with the variety of ecosystems on Earth

Hotspots of biodiversity are critical for the preservation of global biodiversity because they represent a small fraction of the Earth's surface but host a significant proportion of its species.
However, these regions are also under significant threat from human activities such as deforestation, habitat destruction, pollution, and climate change.
Conservation efforts in hotspots of biodiversity focus on protecting and restoring habitats, implementing sustainable land use practices, and raising awareness about the value of biodiversity.

Q5. B)

Urban areas face a range of energy-related problems as a result of their high population density, rapid urbanization, and increased energy demands. These problems have significant implications for both the environment and the well-being of urban residents.

1. Energy Consumption and Demand: Urban areas tend to have higher energy consumption and demand compared to rural areas due to factors such as

increased population, greater use of appliances and electronic devices, and the need for transportation services. This high energy demand puts pressure on energy infrastructure and contributes to greenhouse gas emissions and air pollution.

2. Air Pollution: The concentration of energy-intensive activities and transportation in urban areas leads to significant air pollution. Fossil fuel combustion from vehicles, industrial processes, and power generation releases pollutants such as particulate matter, nitrogen oxides, and sulfur dioxide, which have adverse effects on air quality and public health.
3. Greenhouse Gas Emissions: Urban areas are major contributors to greenhouse gas emissions, primarily through energy consumption and transportation. The burning of fossil fuels for electricity, heating, and transportation releases carbon dioxide (CO2) and other greenhouse gases, contributing to climate change and its associated impacts.
4. Energy Inefficiency: Many urban buildings, both residential and commercial, suffer from energy inefficiency. Poor insulation, outdated infrastructure, and inefficient heating, ventilation, and air conditioning (HVAC) systems lead to excessive energy consumption and higher energy costs. Energy inefficiency exacerbates the strain on energy resources and increases greenhouse gas emissions.
5. Energy Poverty: Urban areas can also face energy poverty, where a significant portion of the population lacks access to affordable and reliable energy services. This issue often affects low-income communities and can lead to inadequate heating or cooling, limited access to electricity, and increased vulnerability during extreme weather events.
6. Energy Infrastructure Challenges: Meeting the energy demands of growing urban populations requires robust and reliable energy infrastructure. Urban areas need to invest in modernizing power grids, expanding renewable energy sources, and improving energy storage systems. Aging infrastructure can be a barrier to sustainable and resilient energy systems.

Q5. C)

- There are a host of environmental problems caused by human actions on the environment. If we are to respond to these problems, we have to recognize that each of us is individually responsible for the quality of the environment we live in.

- The necessitates that individuals should not only be aware of various environmental issues and the consequences of their actions on the environment but should also make a firm resolve to develop environmentally ethical lifestyles.

Concepts that help individuals contribute towards a better quality of our environment and human life.

- Develop respect or reverence for all forms of life.
- Try to plant trees wherever you can and more importantly take care of them. They reduce air pollution.
- Do not buy furniture, doors, window frames made from tropical hardwoods such as teak and mahogany. These are forest based.
- Help in restoring a degraded area near your home or join in an afforestation program.
- Don’t use aerosol spray products and commercial room air fresheners. They damage the ozone layer.
- Do not pour pesticides, paints, solvents, oil or other products containing harmful chemicals down the drain or on the ground.
- Choose items that have the least packaging or no packaging.

Q5. C)

- Ozone layer depletion refers to the gradual thinning and damage of the Earth's ozone layer, primarily in the stratosphere, due to the release of certain human-made chemicals.
- The ozone layer acts as a shield, protecting us from the sun's harmful ultraviolet rays.
- However, certain human-made chemicals called ozone-depleting substances (ODS) have been released into the atmosphere.
- These chemicals, including chlorofluorocarbons (CFCs), halons, and carbon tetrachloride, can reach the stratosphere and cause damage to the ozone layer.
- When ODS reach the ozone layer, they undergo a chemical reaction triggered by UV radiation, which leads to the breakdown of ozone molecules.
- This reaction reduces the concentration of ozone, creating a hole or thinning in the ozone layer. This is commonly referred to as ozone layer depletion.
- The consequences of ozone layer depletion are significant. UV radiation can reach the Earth's surface more easily, causing harm to human health, such as skin cancer, cataracts, and weakened immune systems. It can also harm

marine life, plants, and ecosystems, disrupting the delicate balance of our planet's biodiversity.

- The Montreal Protocol, an international agreement signed by many countries, aims to phase out the production and use of ozone-depleting substances.

Q5. D)

- Disaster management for landslides involves strategies and actions aimed at minimizing the risks and impacts of landslides on human lives, infrastructure, and the environment.
- Landslides are the sudden movement of rocks, soil, or debris down a slope, which can be triggered by heavy rainfall, earthquakes, or human activities. To manage the risks associated with landslides, certain measures can be taken:

1. Early Warning Systems: Implementing early warning systems can help provide timely alerts and notifications to communities living in landslide-prone areas. When an impending landslide is detected, warnings can be issued to residents, allowing them to evacuate to safer locations.
2. Hazard Mapping and Zoning: Conducting detailed surveys and assessments to identify areas prone to landslides is crucial. Hazard mapping involves studying the terrain, geology, rainfall patterns, and historical landslide occurrences. Based on this information, authorities can create hazard maps and zoning regulations that restrict or control development in high-risk areas.
3. Infrastructure Design and Maintenance: Constructing and maintaining infrastructure in landslide-prone areas requires careful consideration. Engineers and architects need to design structures that can withstand the forces exerted by landslides. Regular inspections and maintenance of existing infrastructure are also important to ensure their stability and resilience.
4. Public Awareness and Education: Raising awareness among communities about landslides and their potential risks is vital. Educating people about the signs of an impending landslide, evacuation procedures, and safe behavior during and after a landslide event can save lives.
5. Land Use Planning and Regulation: Effective land use planning and regulation are essential for preventing unplanned and uncontrolled development in

landslide-prone areas. Government authorities and urban planners should enforce regulations that consider the vulnerability of the land to landslides.

6. Emergency Response and Recovery: Establishing emergency response mechanisms is crucial for effectively managing landslides. After a landslide event, quick response actions are necessary to search and rescue survivors, provide medical aid, and initiate recovery and rehabilitation measures.

Q5. E)

Refer Unit 4 PPT from slide no. 16 to 22.

Q5. F)

Food Chain:

A food chain is a sequence of organisms where each member is a source of food for the next member. It represents the transfer of energy and nutrients from one organism to another in an ecosystem. A typical food chain consists of producers, consumers, and decomposers. Here's an example of a food chain:

Grass → Grasshopper → Frog → Snake → Hawk

In this example, grass is the producer as it produces its own food through photosynthesis. The grasshopper is the primary consumer as it feeds on the grass. The frog is the secondary consumer as it eats the grasshopper. The snake is the tertiary consumer as it preys on the frog. Finally, the hawk is the top predator and the quaternary consumer as it feeds on the snake. Each organism in the food chain relies on the one before it for energy and nutrients.

Food Web:

A food web is a more complex representation of feeding relationships in an ecosystem. It consists of interconnected food chains, illustrating the flow of energy and the interactions between multiple organisms. It recognizes that most organisms have multiple food sources and are part of several different feeding relationships. Here's an example of a food web:

Grass → Grasshopper ← Rabbit ← Fox ↑ └── Snake ← Hawk

In this example, the grass is consumed by both the grasshopper and the rabbit. The rabbit is a primary consumer, while the fox is a secondary consumer that preys on the rabbit. The snake is a secondary consumer that feeds on both the grasshopper and the rabbit. The hawk is the top predator that consumes the snake. The arrows in the food web indicate the direction of energy flow.

Food webs provide a more realistic representation of the complex interactions and interdependencies between organisms in an ecosystem. They demonstrate that organisms can occupy multiple trophic levels and have various food sources. Changes in one population within the food web can have ripple effects on other populations, highlighting the interconnected nature of ecosystems.