

**GE6351/Environmental Science and Engineering**  
**UNIT I – ENVIRONMENT, ECOSYSTEMS AND BIODIVERSITY**

**1. Define environment.**

Environment is defined as the sum of total of all the living and non-living things around us influencing one another.

**2. What are all the categories of environment?**

The main categories of environment are biotic and abiotic environments. abiotic environment can further be classified into atmosphere (air), lithosphere (soil), and hydrosphere (water). The biotic environment is called as biosphere..

**3. Write the components of environment?**

Air (Atmosphere)  
Land (Lithosphere)  
Water (Hydrospher)

**4. Define ecosystem.**

A group of organisms interacting among themselves and with environment is known as ecosystem. Thus an ecosystem is a community of different species interacting with one another and with their nonliving environs exchanging energy and matter.

**5. List any four characteristics of ecosystem.**

- (i). Ecosystem is the major ecological unit.
- (ii). It contains both biotic and abiotic components.
- (iii). The boundary of the ecosystem is not rigidly defined and it is flexible.
- (iv). Through the biotic and abiotic components nutrient cycle and energy flow occur.

**6. What are the different types of ecosystem**

1. Natural Ecosystem
2. Artificial Ecosystem
3. Incomplete Ecosystem

**7. Write about autotrophic organisms.**

The producers are plants and bacteria, capable of producing their own food photosynthetically or by chemical synthesis. These organisms are, thus, self-nourishing as they can produce the as they can produce their own food by using the energy from the physical environment surrounding them .them are also know as autotrophic organism or producer.

**8. Write about heterotrophic organisms**

These organisms depend on other animals or on the food produced by other organisms for their nourishment, they are also called as heterotrophic organisms or consumers.

**9. What do you know about food chain and food web?**

A food chain is a picture or model that shows the flow of energy from Autotrophs to a series of organisms in an environment. The network like interaction of organisms is called as food web.

**10. Define food chain.**

The sequence of eating and being eaten in an ecosystem is known as food chain or transfer of food energy from the plant through a series of organisms is referred to as food chain.

**11. Name three types of food chains.**

- a. Grazing food chain
- b. Detrius or Decomposer food chain
- c. Parasitic food chain.

**12. Define food web.**

The interlocking pattern of various food chain in an ecosystem is known as food web.

**13. Define ecological pyramids.**

Graphical representation of structure and function of tropic levels of an ecosystem, starting with

producers at the bottom and each successive trophic level forming the apex is known as an ecological pyramid.

**14. Define primary succession.**

The succession taking place in areas that have not already been occupied by any community is known as primary succession.

**15. Define secondary succession.**

Development of a new community in an area where the previously existing community was removed and the ecological conditions are favourable is termed as secondary succession.

**16. Define biodiversity.**

Biodiversity is defined as the variety and variability among all groups of living organisms and the ecosystem in which they occur.

**17. What are the three types of biodiversity?**

1. Genetic Level or Genetic diversity
2. Species Level or Species diversity
3. Ecosystem Level or Ecosystem diversity.

**18. Define genetic diversity.**

Genetic diversity is the variation of genes within species. Genes are the basic units of all life on earth. They are responsible for both the similarities and the differences between organisms.

**19. Define species diversity.**

Species diversity is the number of different species of living things available in an area. Species is a group of plants or animals that are similar and able to breed and produce viable offspring under natural conditions. This type of diversity is the most common level of diversity.

**20. Define ecosystem diversity.**

Ecosystem diversity is the variety of ecosystems in a given place. An ecosystem is a community of organisms and their physical environment interacting together. An ecosystem can cover a large area, such as a whole forest, or a small area, such as a pond.

**21. What are the two main functions of biodiversity?**

- a. It is the source of species on which the human community depends for food, fiber, shelter, fuel and medicine.
- b. It depends on the biosphere, which in turn leads to the stability in climate, water, soil, air, and the overall health of biosphere.

**22. Define biogeography.**

The study of the geographical distribution of biological species relating to the geological, evolutionary, climatological, geographical, biological reasons for the distribution is called biogeography. Define biogeography. The study of the geographical distribution of biological species relating to the geological, evolutionary, climatological, geographical, biological reasons for the distribution is called biogeography.

**23. Biodiversity hotspots are areas:**

- i. Rich in plant and animal species, particularly many endemic species, and
- ii. Under immediate threat from impacts such as land clearing, development pressures, salinity, Weeds and feral animals.

**24. List some of the major biodiversity threats.**

- (a) Habitat destruction.
- (b) Extension agriculture.
- (c) Filling up of wetlands.
- (d) Conversion of rich bio-diversity site for human settlement and industrial development

**25. What do you know about conservation of biodiversity?**

Conservation is defined as the management of human use of the biosphere so that it may yield the greatest sustainable benefit while maintaining its potential to meet the needs and aspirations of future generations“.

**26. What are the two types of biodiversity conservation?**

- (i).In-situ conservation
- (ii)Ex-situ conservation.

**27. What is endemic species?**

The species, which are found only in particular region are known as endemic species.

**28. Define in-situ conservation.**

In-situ conservation involves protection of fauna and flora within its natural habitat, where the species normally occurs is called in-situ conservation.

**29. Define ex-situ conservation.**

Ex-situ conservation involves protection of fauna and flora outside the natural habitats.

**PART-B**

1. Explain briefly about the characteristic of ecosystems.
2. How can you classify the ecosystems?
3. Structure and function of an ecosystem.
4. Explain energy flow in the ecosystem.
5. Describe ecological succession.
6. Explain types of aquatic ecosystems.
7. Biogeographical classification of India.
8. Explain about the different types of biodiversity.
9. Write about value of biodiversity.
10. Explain India as a mega-diversity nation.
11. Explain Hot-spots of biodiversity.
12. Describe Threats to biodiversity.
13. Explain Endangered and endemic species of India.
14. Explain conservation of biodiversity.

**UNIT II – ENVIRONMENTAL POLLUTION**

**1. Define pollution.**

Environmental pollution may be defined as the unfavorable alteration of our surroundings its change the quality of the air, water and land which interferes with the health of humans and other life on earth

**2. Types of pollutants.**

- (i)Biodegradable pollutants
- (ii)Non-biodegradable pollutants

**3. Define air pollution.**

Air pollution is defined as the presence of one or more contaminates like dust, smoke, mist and odor in the atmosphere which are injurious to human beings, plants and animals.

**4. What are the different sources of air pollution?**

The two main sources of air pollution are  
a. Natural Sources.

Natural sources include dust storms, volcanoes, lightening sea salt, smoke, and forest

fires.

b. Man made or anthropogenic sources.

The man made sources are agricultural activities, industrial growth, domestic wastes, automobile exhausts, etc,

### **5. Define photo chemical smog.**

A photochemical reaction is any chemical reaction activated by light that air pollution knows as photochemical smog is a mixture of more than 100 primary and secondary pollutants formed under the influence of sun light. Its formation begins inside automobile engines and the boilers an in coal-burning power and industrial plants.

### **6. What do you know about particulate?**

In general the term „particulate“ refers to all atmospheric substances that are not gases. They can be suspended droplets or solid particles or mixtures of the two. Particulates can be composed of materials ranging in size from 100mm down 0.1 mm and less. The chemical composition of particulate pollutants is very much dependent upon the origin of the particulate.

### **7. Define suspended particulate matter**

Suspended Particulate Matter (SPM) is a complex mixture of small and large particles with size less than 100u varying origin and chemical composition.

### **8. Differentiate between Mist and Fog.**

Mist is made up of liquid droplets generally smaller than 10um which are formed by condensation in the atmosphere or are released from industrial operations.

Fog is similar to mist but the droplet size bigger (> 10u) and water is the liquid. Fog is sufficiently dense to incomprehensible vision.

### **9. What are effects of air pollution on animals?**

Animals take up fluorides of air through plants. Their milk production falls and their teeth and bones are affected. They are also prone to lead poisoning and paralysis.

### **10. List some of the effects of air pollution on physical properties of atmosphere.**

- a. Decrease in the visibility
- b. Reduction of Solar radiation.
- c. Effects on weather conditions.
- d. Effects on atmospheric constituent.

### **11. Briefly describe about the impacts of carbon monoxide on human health.**

At lower doses, they can impair concentration and neurobehavioral function whereas in higher doses they can cause heart pain and even death. When inhaled it has the ability to combine with haemoglobin of blood and reduce its ability in transfer of oxygen to the brain, heart, and other important organs. But carboxyaemoglobin contents of blood depend on the CO contents of the air inhaled, time of exposure and the activity of the person inhaling.

### **12. How air pollution can be controlled at source?**

- a. Proper use of the existion equipment
- b. Change in process.
- c. Modification or Replacement of equipments.
- d. Installation of controlling equipments.

### **13. Define water pollution.**

Water pollution may be defined as the alteration in physical, chemical and biological characteristics of water which may cause harmful effects on humans and aquatic life.

### **14. What are the effects of in organic substances in water?**

- A. Makes the water unfit for drinking and other purposes.
- B. Corrosion of metals exposed to such waters.
- C. Causes skin cancers, damages to spinal, CNS, liver and kidneys.
- D. Reduces crop yield.

**15. How do the nutrients from agricultural fields affect the watershed?**

Enrichment of nutrients (Eutrophication) from surrounding watershed affects the penetration of light through the water, causing damage to the characteristic of water and aquatic life.

**16. Define soil pollution.**

Soil pollution is defined as the contamination of soil by human and natural activities which may cause harmful effects on living beings

**17. Define marine pollution.**

Marine pollution is defined as the discharge of waste substance into the sea resulting in harm to living resource, hazards to human health, hindrance to fishery and impairment of quality for use of sea water.

**18. Define noise pollution.**

Noise pollution is defined as the unwanted, unpleasant or disagreeable that causes discomfort for all living beings.

**19. What is the cause of noise pollution?**

- a. Road traffic noise
- b. Air traffic noise
- c. Rail traffic noise
- d. Domestic noise
- e. Industrial noise
- f. Incompatible land use.

**20. Define thermal pollution.**

Thermal pollution is defined as the addition of excess of undesirable heat to water that makes it harmful to man, animal or aquatic life or otherwise causes significant departures from the normal activities of aquatic communities in water.

**21. What are solid wastes?**

The wastes generated and discarded from human and animal activities that are normally solid are called as solid wastes.

**22. What are solid know about on –site handling?**

The activities involved in handling of solid wastes, at the point of generation, until they are placed in the containers used for their storage before collection are called as on –site handling. Handling requires to move the filled containers to the collection point and to return the empty containers to the generation point for the next collection.

**23. What is the purpose of on-site processing?**

On-site processing of solid wastes is used to recover the reusable materials from the solid wastes. This process also helps in reducing the volume of solid wastes or altering the physical form of the solid wastes.

**24. What are the types of municipal solid wastes collection system?**

1. Hauled container.
2. Stationary container systems.

**25. What are the main purposes of processing techniques used in solid waste management?**

- a. To improve the efficiency of solid waste management systems
- b. To recover the usable materials for reuse.
- c. To recover conversion products and energy.

**26. List out the techniques of processing of solid wastes.**

- a. Compaction (Mechanical volume reduction)
- b. Incineration (Chemical volume reduction)
- c. Shredding (Mechanical size reduction)
- d. Component separation

e. Drying and Dewatering (Moisture content reduction).

**27. Name some of the mechanical separation methods of solid wastes?**

- a. Air separation
- b. Magnetic separation
- c. Screening

**28. List out the three types of system used in the collection of wastewater.**

- a. Separation System
- b. Combined System
- c. Partially Separate system.

**29. What is the main objective of sludge digestion?**

The main objective of sludge digestion is to break the organic matter of the sludge into liquid and simple compounds which are stable and unfold in nature

**30. How can you define hazardous wastes?**

Wastes that create danger to the living community, immediately or over a period of time, are called as hazardous wastes.

**31. What are biomedical wastes?**

Biomedical wastes are defined as any solid, semi solid or liquid waste including its containers and any intermediate product which are generated during diagnosis, treatment or immunization of human being/ animals or in production and testing of biological parts.

**32. Can you list out some of the benefits of pollution prevention?**

- a. Minimizes health risks.
- b. Reduces the production of pollutants to a minimum or eliminates them.
- c. Accelerates the reduction or elimination of pollutants.
- d. Helps avoid transferring pollutants from one medium to another, thereby preventing diffusion in the environment.
- e. Helps promote a more effective use of energy, materials and resources.

### **PART B:**

- 1. Explain air pollution.
- 2. What are the different sources and types of air pollutants?
- 3. How do you control air pollution?
- 4. Explain water pollution.
- 5. Write about soil pollution.
- 6. What are the different sources of soil pollution?
- 7. Give an account on marine pollution.
- 8. What are the different sources of marine pollution?
- 9. Describe the Thermal pollution.
- 10. Explain about nuclear hazards.
- 11. State the role of an individual in prevention of pollution.
- 12. Explain clearly about the stages of solid waste management.
- 13. What are the important stages of hazardous waste management?

## UNIT III – NATURAL RESOURCES

### 1. Define renewable resources.

The renewable resources are those resources which have the inherent capacity to reappear, or replenish themselves by quick recycling, reproduction, and replacement within a reasonable time, and to maintain themselves. Example; air, water, soil (land), and plants, and animals

### 2. Define non-renewable resources.

The non-renewable resources are those that do not have the ability for recycling and replacement within a reasonable period of time.

Example; minerals, coal oil, natural gas, ground water

### 3. List some of the renewable energy sources.

- a. Solar energy
- b. Wind energy
- c. Hydro energy
- d. Geo-thermal energy
- e. Ocean thermal energy

### 4. Define deforestation.

Deforestation is the process of removal of (or) elimination of forest resources due to many natural or man-made activities. In general, deforestation means destruction of forests.

### 5. What is mining?

Mining is the process of extracting mineral resources and fossil fuels like coal from the earth. These deposits are found in the forest region and any operation of mining will naturally affect the forest. Mining operation requires removal of vegetation along with underlying soil mantle.

### 6. Define drought.

Drought is nothing but scarcity of water, which occurs due to inadequate rainfall, late arrival of rains and excessive withdrawal of ground water.

### 7. Define food resources.

Food is an essential requirement for the human survival. Each person has minimum food requirement, the main components of food are carbohydrates, fats, protein, minerals, and vitamins.

### 8. Uses of forest.

- a. Wood used as fuel.
- b. Various industries. Used raw materials as pulp, paper, board, timber
- c. Many plants are utilized in preparing medicines and drugs
- d. Forest products, like gums, resins, dyes.

### 9. Types of mining.

- A. surface mining:
  - B. It involves mining of minerals from the shallow deposits.
- Є. Underground mining:
  - D. It involves mining of minerals from deep deposits.

## **10. What is hydrological cycle?**

The water from various water bodies gets evaporated by the solar energy, and falls again on the earth in the form of rain or snow and enter into the living organisms and plants and ultimately returns to the ocean. This process is called hydrological cycle.

Clouds → water (ocean, lake, river) → living organisms & plants.

## **11. Define floods.**

A flood is an overflow of water, whenever the magnitude of flow of water exceeds the carrying capacity of the channel within its banks.

## **12. Cases of flood.**

- a. Heavy rainfall, melting of snow (ice), sudden release of water from dams, often causes floods in the low-lying coastal area.
- b. Prolonged downpour can also cause the over-flowing of lakes and rivers resulting into floods.
- c. The removal of dense and uniform forest cover over the hilly zones leads to occurrence of floods.

## **13. List some of the food resources available in the world.**

Major food sources available in the world to cater the human's hunger are 12 types of seeds and grains, 3 root crops, 20 common fruits and vegetables, 6 mammals, 2 domestic fowl, few fishes and other forms of marine life etc.

## **14. Define Traditional Agriculture.**

Traditional Agriculture can be classified as Traditional Subsistence agriculture and Traditional Intensive agriculture. Traditional Subsistence agriculture produces enough crops or live stock for a farm family's survival and in good years, a surplus to sell or put aside for hard times. In Traditional Intensive agriculture farmers increase their inputs of human and draft labour, fertilizer, and water to get a higher yield per area of cultivated land to produce enough food.

## **16. Write short notes on Tidal energy.**

Tides, the alternate rise and fall of sea water possess lot of energy. The identified tidal power potential in India is around 9000 MW. Currently France, Russia, China and Canada are effectively utilizing the tidal energy to produce 2 to 3% of their energy demand.

## **17. Define Soil Erosion.**

Soil erosion is the movement of soil components, especially surface litter and top soil, from one place to another. The two main movers are flowing water and wind.

## **18. List some ways to protect soil.**

- a. When the buildings are constructed, all the trees shall be saved.
- b. Setting a composite bin and it shall be used for producing mulch and soil
- c. Conditioner for yard and garden plants so organic methods can be used for growing vegetables.
- d. Strictly enforcing laws and policies that minimize soil erosion, salt buildup and water logging.

## **20. What is equitable use of resources?**

The Equitable use of resources is a concept that deals with the rational use of resources so that a harmony between man's resource requirement and its availability can be established.

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## **22. Define drought.**

Drought is nothing but scarcity of water which occurs due to inadequate rainfall, late arrival of rains and excessive withdrawal of ground water.



**23. Give the classification of Mineral Resources.**

Energy resources (coal, oil, natural gas, uranium, and geothermal energy; metallic mineral resources (iron, copper and aluminum) and nonmetallic minerals resources (salt, gypsum and clay, sand, phosphates, water, and soil).

**24. Write short note on blue baby syndrome.**

When the nitrogenous fertilizers are applied in the fields they leach deep into the soil the contaminate the ground water. the nitrate concentration in the water gets increased. When the nitrate concentration exceeds 25mg /lit they cause series health problems called blue baby syndrome this disease affects infants and leads even to death.

**25. Define energy.**

Energy may be defined as any property, which can be converted into work (or) the capacity to do work.

**26. Write short notes on petroleum gas.**

It is the mixture of three hydrocarbons butane, propane and ethane. The main constituent of petroleum gas is butane. The above gases are in gaseous state in ordinary pressure but they can be liquefied under high pressure. So it is called as LPG. (Liquefied petroleum Gas).

A domestic cylinder contains 14 kg of LPG. A strong smelling substance called ethyl mercaptan is added to LPG gas cylinder to help in the detection of gas leakage.

**27. List some of the renewable energy sources.**

- a. Solar energy
- b. Wind energy
- c. Hydro energy
- d. Geo-thermal energy
- e. Ocean thermal energy
- f. Biogas

**28. Define wind energy.**

Moving air is called wind. Energy recovered from the force of the wind is called wind energy. The energy possessed by wind because of its high speed. The wind energy is harnessed by making use of wind mills.

**29. What is ocean thermal energy?**

There is often large temperature difference between the surface level and deeper level of the tropical oceans. This temperature difference can be utilized to generate electricity. The energy available due to the difference in temperature of water is called ocean thermal energy.

**30. Define LPG.**

The petroleum gas obtained during the cracking and fractional distillation can be easily converted into liquid under high pressure called as LPG. LPG is colorless and odorless gas. But during bottling some mercaptans is added, which produces bad odour.

**31. What is land degradation?**

Land degradation is the process of deterioration of soil or loss of fertility of the soil.

**PART B:**

1. Discuss the effect of deforestation.
2. What are the cases of soil erosion?
3. Explain forest resources.
4. Explain about fresh water resources.
5. Environmental effects of extracting and using mineral resources.
6. Write about World food problems,
7. Changes caused by agriculture and overgrazing.

8. Effects of modern agriculture, fertilizer-pesticide problems.
9. Explain about land degradation.
10. Write about man induced landslides.
11. Role of an individual in conservation of natural resources.
12. Equitable use of resources for sustainable lifestyles.

## UNIT IV– SOCIAL ISSUES AND THE ENVIRONMENT

### **1. State the declaration about the sustainable development.**

The Rio declaration states that, “human beings are at the center or concern for sustainable development. They are entitled to a health and productive life in harmony with the nature. Rvery generation should leave air. Water and soil resources without any pollution as pure as it came to the Earth.”

### **2. Define sustainable development.**

Sustainable development is defined as meeting the needs of the preset without compromising the ability of future generations to meet their own needs.

### **3. What are the three important components of sustainable development?**

The three important components of sustainable development are

- a. Economic development (like industrial development, creating job opportunities, utilization of natural resources for developing the quality of life)
- b. Community development (providing food, shelter, cloth, education, and other essentials for the human beings).
- c. Environmental protection (providing clear air, water and environment for the present and future generations and utilization of resources in a sustainable manner).

### **4. Define sustainable development indicators**

Sustainable development Indicators (SDI) is various statistical values that collectively measure the capacity to meet present and future needs. SDI will provide information crucial to decisions on national policy and to the general public.

### **5. What are the uses of sustainable development indicators?**

The indicators are used by decision makers and the policy makers at all levels in order to monitor the progress towards attaining sustainable development. These are also used to increase focus on the sustainable development.

### **6. Define sustainability.**

Sustainability can be defined as the ability of a society or ecosystem to continue functioning into the indefinite future without being forced into decline through complete loss of its strength or overloading of key resources on which that system depends.

### **7. Define resistance stability and resilience stability.**

Resistance stability is the ability of a system to remain stable in the face of stresses and Resilience stability of the system to recover from the disturbance occurred due to the activities happened.

### **8. Define urbanization.**

Urbanization is defined as „the process movement of human population from rural areas to urban areas in search in search of better economic interests with better education, communication, health, civic facilities and other day to day needs.

**9. What are problems or discomforts faced by rural people?**

- a. Lack of modernization of agricultural sector.
- b. Lack of job opportunities.
- c. Poor life style.
- d. Poor health facilities Poor education facilities.
- e. Poor transportation facilities.
- f. Poor availability of energy.

**10. What are the uses of energy in urban areas?**

Energy is used in an urban area for the following.

- a. For industrial activities
- b. For transportation
- c. For water apply
- d. For building & commercial use
- e. For cleaning of pollutants
- f. For essential services.

**11. Define water conservation.**

The process of saving water for future utilization is known as water conservation.

**12. Define rain water harvesting.**

Rain water harvesting is a technique of capturing and storing of rainwater for further utilization.

**13. Define watershed.**

Water shed is defined as the land area from which water drains under the influence of gravity into a steam, lake, reservoir or other body of surface water.

**14. What do you know about watershed?**

A watershed is defined as the geographic area from which water in a particular stream, lake or estuary originates. It includes entire area of land that drains into the water body. It is separate from other system by high points in the area such as hills or slopes.

**15. What is watershed management?**

Watershed management is a process aimed at protecting and restoring the habitat and water resources of a watershed, incorporating the needs of multiple stakeholders.

**16. What are the impacts of human activities on watershed?**

- a. Alteration of water course
- b. Addition of pollution sources
- c. Urbanization
- d. Securing of channels.

**17. What are the two important principles of watershed management?**

The two important principles of watershed management are:

- a. To preserve the environment, and
- b. To use the most cost-effective means to achieve this goal.

**18. Name some of the factors causing relocation of people.**

- a. Development activities
- b. Natural and man-made disasters
- c. Conservation initiatives.

**19. Define environmental ethics.**

Environmental ethics refers to the issues, principals and guidelines reading to human interactions with their environment.

**20. Define resettlement.**

Resettlement is defined as the process of simple relocation or displacement of human population without considering their individual, community or societal needs.

**21. Define rehabilitation.**

Rehabilitation is defined as the process of replacing the lost economic assets, rebuilding the community system that have been weakened by displacement, attending to the psychological trauma of forced separation from livelihood.

**22. What are the factors that influence climate change on the earth?**

Climate change on the earth is influenced by the following factors.

- a. Variations in the Earth's orbital characteristics.
- b. Atmospheric carbon dioxide variations.
- c. Volcanic eruptions
- d. Variations in solar output.

**23. List out any four effects of climate change.**

Mean sea level is increased on an average of around 1.8mm per year. Many ecosystems of the world have to adapt to the rapid change in global temperature. The rate of species extinction will be increased. Human agriculture, forestry, water resources and health will be affected.

**24. Define green house effect.**

The green house effects may be defined as the progressive warming up of the earth's surface due to blanketing effect of manmade CO<sub>2</sub> in atmosphere.

**25. Define global warming.**

The increased the inputs of CO<sub>2</sub> and other green house gases into the atmosphere from human activities will enhance the earth's natural green house effects of raising the average global temperature of the atmosphere near the surface. This enhanced the green house effect is called warming.

**26. How can global warming are controlled.**

- a.Reduction in consumption of fossil fuel such as coal and petroleum.
- b. Use of biogas plants.
- c. Use of nuclear power plants.
- d. Increasing forest cover.
- e. Use of unleaded petrol in automobiles.
- f.Installation of pollution controlling devices in automobiles and industries.

**27. Define acid rain.**

Normally rain water is always slightly acidic because of the fact that CO<sub>2</sub> present in the atmosphere gets dissolved on it. Because of the presence the of SO<sub>2</sub> and NO<sub>2</sub> gases as pollutants in the atmosphere, the pH of the rain water is further lowered. This type precipitation of water called acid rain or acid deposition.

**28. List any four impacts of acid rain.**

- a. Both dry and wet deposition of sulphur dioxide significantly increases the rate of corrosion of lime stone, sand and marble.

- b. Forest tree population is effected by acid rain.
- c. Acid rain in combination with ozone may damage the wxy coating on leaves and needles. This may weaken or damage them and provide opportunities for disease to enter the tree.
- d. Acid rain may change the characteristics of soil and eventually pollute the streams and lakes.

**29. Define wet deposition and dry deposition. Is there any difference in damage due to these two types of deposition?**

Wet deposition refers to acidic rain, fog, and snow. As this acidic water flowers over and through the ground, it afferts plants and animals in many ways. Dry deposition refers to acidic gases and particles. About half of the acidity in the atmosphere falls back to earth through dry deposition. Both wet and dry deposition can cause the same damage.

**30. How can we minimize the formation of acid rain?**

- a. By reducing pollution from industries,
- b. By using other sources of energy,
- c. By using cleaner automobiles.

**31. Name any three most important types of CFC which are responsible for ozone depletion.**

- a. Trichlorofluoromethene,
- b. Dichlorodifluoromethane,
- c. 1, 1, 2 Trichlorotrifluoroethane.

**32. What are the harmful effects of ozone layer depletion on human beings?**

- a. Reddening of skin in sun shine (Sun burn)
- b. Skin Cancer.
- c. Reduction in body"s immunity to disease.
- d. Eye disorders like Cataracts and Blindness.

**33. Define waste land.**

Waste lands are defined as the lands which re unstable in ecologically and topographically with complete loss or its fertility status. In these types of lands the toxicity for the growth of crops or trees are developed due to environmental or anthropogenic problems.

**34. What are the causes for formation of waste land?**

- a. Deforestation.
- b. Desertification.
- c. Soil loss.
- d. Industrial pollution.

**35. What are the causes for formation of waste land?**

- e. Deforestation.
- f. Desertification.
- g. Soil loss.
- h. Industrial pollution.

**36. What is the need for waste land reclamation?**

Population of the world is increasing at an alarming rate. This increases demand for food and demand of land for shelter and other resources. The available land area should be properly utilized for making food for increasing population of the world.

**37. Nuclear holocaust.**

It means distraction of biodiversity by nuclear equipments and nuclear bombs. In a holocaust, large numbers of living beings are totally destroyed. Usually, these kinds of distractions are happened in a nuclear war.

### **PART B:**

1. Explain about unsustainable to sustainable development.
2. Explain briefly global warming.
3. Write about enforcement machinery involved in environmental legislation.
4. Write about environmental protection act India.
5. Write about wasteland reclamation.
6. Discuss a. Acid rain b. Ozone layer depletion.
7. Explain about resettlement and rehabilitation of people.
8. Write about role of nongovernmental organization.
9. Discuss about environmental ethics.

### **UNIT V – HUMAN POPULATION AND THE ENVIRONMENT**

#### **1. How the population problem in India is analyzed?**

India's population problem may be viewed from three aspects

- a. The absolute size of population.
- b. The rate of growth of the population.
- c. The age structure of the population.

#### **2. What is population explosion?**

Population explosion means the rapid population growth which is unexpected and unimaginable. The graph of recent population growth is referred to as a „J“ curve as it follows the shape of that letter, starting out low and skyrocketing straight up.

#### **3. List the effect of population explosion.**

- a. Increased consumption of resources available in the environment and depletion of the same quickly.
- b. Due to over –consumption of natural resources, the environment gets deteriorated and polluted.
- c. There will be desertification, deforestation, soil erosion, loss of fertility and poor productivity.
- d. Mass poverty, poor per-capital availability of food for consumption and prevalence of disease on large scale.
- e. Rapid urbanization resulting in growth of slums in cities and towns.
- f. Inefficient management and ineffective control at all levels leading to poor quality of life.

#### **4. Define wellness.**

Wellness is a state of optimal well being. Wellness emphasizes each individual's responsibility for making decisions that will lead not only to the prevention for disease but to the promotion of a high level of health.

#### **5. Name some health related fitness components.**

- a. Muscular strength and endurance.
- b. Flexibility.
- c. Body composition.
- d. Cardio-vascular endurance.

#### **6. Define Demography.**

It refers to the science of dealing with the study of size, composition and territorial

distribution of population; it includes study of natality, fertility, mortality, migration, and social mobility.

**7. What is vital statistics?**

Vital statistics are referred to systematically collected and compiled data relating to vital events of life such as birth, death, marriage, divorce, adoption, etc. Vital statistics are an indication of the given situation and help us in answering many health-related queries.

**8. Name the fundamental rights of an Indian citizen.**

- a. Right to equality
- b. Right to freedom of Speech and Activity
- c. Right against Exploitation
- d. Right to Freedom of Religion
- e. Cultural and Educational Rights
- f. Right to Constitutional Remedies.

**9. Write short notes on common property resources.**

Our environment has a major component that does not belong to individuals. There are several commonly owned resources that all of us use as a community. The water that nature recycles, the air that we all breathe, the forests and grasslands which maintain our climate and soil, are all common property resources

**10. What is HIV?**

HIV stands for Human Immuno-deficiency Virus and is a virus that can damage the body's defence system so that it cannot fight off certain infections.

**11. What is AIDS?**

AIDS stands for (Acquired Immuno Deficiency Syndrome). An HIV infected person receives a diagnosis of AIDS after developing one of the AIDS indicator illness, A positive HIV test result does not mean that person has AIDS. A diagnosis of AIDS is made by a physician using certain clinical criteria (Eg: AIDS indicator illnesses).

**12. What is opportunistic infection?**

Infection with HIV can weaken the immune system to the point that it has difficulty fighting off certain infections. These types of infections are known as "opportunistic infections" because they take the opportunity to weaken the immune system which causes illness of the body.

**13. List the means of HIV transmission.**

There are four main ways in which HIV can be passed on:

- a. By having vaginal, anal or oral sex without a condom with someone who has HIV.
- b. By using needles, syringes or other drug-injecting equipment that is infected with HIV.
- c. From a woman with HIV to her baby (before or during birth) and by Breast feeding.
- d. By receiving infected blood, blood products or donated organs as part of medical treatment.

**14. Name some tests available to find HIV infection.**

- a. In addition to the EIA or ELISA and Western blot, other tests now available include:
- b. Radio Immuno Precipitation Assay (RIPA)
- c. Dot -blot immuno binding assay
- d. Immuno fluorescence assay
- e. Nucleic acid testing
- f. Polymerase Chain Reaction (PCR)

**15. List the special features of Comprehensive programme on women and child welfare.**

- a. Personality.
- b. Reduction of Deprivation.
- c. Co-ordinational Effectivity.
- d. Maternity and Motherhood.

**16. Name some applications of IT in health.**

Apart from helping in the administration of hospitals, IT is playing a key role in the health industry. On the, medical care, the IT has varied applications right from the diagnosis, where there are latest tools like CT scans, Ultrasound Sonography etc. Which use It as their basis for diagnosis of ailments. Most of the

ICU<sup>s</sup> (Intensive Care Units) are now using computers to monitor the progress and condition of the patient, undergoing treatments. Apart from this, with help of IT, expert opinions from doctors away from the place can be sought with help of IT tools like video conferencing etc. Apart from this can be used in the analysis and research on various potential medicines /drugs to be used in medical treatments.

**17. List the applications of IT in environment.**

- a. Remote Sensing
- b. Geographic Information System (GIS)
- c. Global Positioning System(GPS)
- d. Meterology

**PART B:**

1. Write about population growth variation among nations.
2. Role of information technology in environment.
3. Write a note on human rights.
4. Explain about family welfare program.
5. Explain about women and child welfare.
6. Write notes on value education.

**CASE STUDIES**

1. Explain Bhopal gas stragedy
2. Write briefly on Chernobyl disaster and gulf war (marine pollution)
3. Explain about nuclear holocaust in Japan.
4. Write short on
  - (i) Sardor sarovar dam
  - (ii) tehri dam
  - (iii) pong dam