

GE 6351-ENVIRONMENTAL SCIENCE AND ENGINEERING

UNIT I ENVIRONMENT, ECOSYSTEMS AND BIODIVERSITY

1. Define the following terms environment, environmental science, environmental engineering and environmental studies.

- Environment: The sum of total for all the living and non-living things around us influencing one another. A French word “Environ” means “surroundings”. Each and everything around us is called environment.
- Environmental science: The study of environment, its biotic and abiotic components and their relationship.
- Environmental engineering: The application of engineering principles to the protection and enhancement of the quality of the environment and to enhance or protect for public health and welfare.
- Environmental studies or environmental education: The process of educating the people for preserving the quality environment.

2. What is the concept of environmental studies? (JAN 2006)

“Need of development without destruction of environment”

3. What are the types of public participation?

The public participation exists in the following forms such as Pressure group, Watch dog, Advisory Council or Agencies and enforcing the environmental laws.

4. What is ecology?

It is the study of structure and function of nature. It is the study of interactions among organisms or group of organisms with their environment or the study of ecosystems.

5. What are the classifications of biotic components?

- Producers (Autotrophic components): To produce food or manufacture of starch by photosynthesis.
- Consumers (Heterotrophic components): Distributing the energy in the form of food to all consumers. It is of two types such as herbivores and carnivores. Decomposers (Saprotrophic components): The dead organisms plants or animals are decomposed to initiate the third function of ecosystem “cycling”

6. What are the types of ecological factors?

Abiotic (living) and Biotic (non-living) components

7. Describe natural sources and state the types of natural sources

Natural sources are the sources which are useful to man or can be transformed into a useful product. These are classified into two types such as Renewable resources (capable of being regenerated) and Non-renewable sources (not capable of being regenerated).

8. What are the ecological services?

Though tree produces very good commercial goods, it also provides the following services such as production of oxygen, reducing global warming, soil conservation, regulation of hydrological cycle, pollution moderators, and wildlife habitat.

9. Explain about renewable resources.

These are capable of being regenerated by ecological processes within reasonable period. They have potential to renew themselves.

Examples: solar, water, wildlife, natural vegetation.

These are further sub classified into two types such as

1. Continuous resources: continuously renewed resources. (Solar energy, wind, tidal energy)
2. Extrinsic resources: resources are prone to breakdown or degradation, yet are continuously if well managed. (Human skills, institutions, management abilities)

10. Define deforestation

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

11. What are the causes of deforestation?

Developmental projects, mining operations, raw materials for industries, fuel requirements, and shifting cultivation and forest fires are the causes of deforestation.

12. What are the consequences or ill effects or impact of deforestation on environment?

Global warming, loss of genetic diversity, soil erosion, loss of biodiversity, loss of food grains, unemployment problems, flood and landslides

13. What is soil erosion? How it occurs.

It is the removal of top soil. The rate of removal of soil exceeds the rate at which it can be produced.

14. What is wind energy?

It is the conversion of wind energy into electricity. It is the kinetic energy of moving air..

15. What is tidal energy?

It is caused by the interaction of gravitational effect of the sun and the moon and the earth rotation.

16. What is the geothermal energy?

It is in present rocks and fluids deep within the earth crust.

17. What is biomass energy?

It is produced by the combustion of the organic matter. Biomass is the organic matter produced by animals and plants used as sources of energy.

18. What is land degradation?

It is agro ecosystem which depends on the capacity of the soil to respond to management.

19. What is desertification?

It is final stages of the process by which formally productive semi arid and arid land is degraded into unproductive desert a result of human activities.

20. What is ocean thermal energy?

It is conversion which makes use of the naturally occurring thermal gradient of the oceans.

21. How the water resources are classified?

Surface and ground water.

22. What are fossil fuels?

They are coal natural and oil which constitutes 87% of our energy resources.

23. Describe mining and its types.

Mining is the process of extracting mineral sources and fossil fuels like coal from the earth. It requires removal of vegetation along with underlying soil mantle. There are two types of mining such as surface mining and underground mining

24. Abbreviate EPA and EIA.

EPA – Environmental Protection Agency ;

EIA – Environmental Impact Assessment.

25. What are five basic causes of environmental problems?

Unsustainable resource, Rapid population growth, Poverty, Neglecting environmental costs in production, Lack of awareness in ecosystems.

26. Differentiate deforestation and forest degradation.

Forest degradation is the process of forest materials. It is a slow process that can be recovered.

Deforestation is the process of destruction of forest materials. It is a rapid process and that can not be recovered.

27. What is wave energy?

Ocean waves are powerful sources of energy. At a wave power station, the waves arriving cause the water in chamber to rise and fall, as the air is forced in and out of the hole in top of the chamber. The air rushing in and out turns a turbine placed in this hole to generate electric power.

28. What are the causes of modern agriculture practices?

Desertification, Over-cultivation, Over-irrigation, Over-grazing,
Pesticides/Insecticides

UNIT II

ENVIRONMENTAL POLLUTION

1.What is ecosystem? (JUNE 2007,DEC 2009)

It is natural functional unit of ecology derived from a Greek word meaning “The study of home”. It comprises living organism and their non living organisms which interact among themselves and with environment to form stable supporting system.

2.How is stability of ecosystem explained?

The stability of an ecosystem describes its capacity to return to equilibrium after being disturbed.

3. What are the functions of ecosystems and state the terms.

Primary function (producer), secondary function (consumer), tertiary function (decomposer) that could be understood by following terms energy flow and material flow, food chains, food webs and food pyramids

4.What are the nutrition cycles in biogeochemical cycles?

Hydraulic cycle, Carbon cycle, Nitrogen cycle, Oxygen cycle and Phosphate cycle.

5. What are the processes of ecological succession?

Nudation, Invasion, Competition, Reaction and stabilizations..

6. What are the stages of ecological succession?.

- i) Pioneer community: The first group of organism that establish their community in that area is called “pioneer community”
- ii) Seres (or) seral stage: The various development stages of a community is called “seres”.

7. What is the difference between food chain and food web?

In linear food chains, if one species get affected or becomes extinct, then the subsequent tropic levels are also affected.

In a food web, if one species get affected or becomes extinct, it does not affect other subsequent tropic levels so seriously. There are number of options available in each tropic level.

8. What are the types of food chain?

Grazing food chains, Parasitic chains and detritus chains.

9. What are the types of ecological succession?.

Based on the conditions present at the beginning of the process, the ecologists recognize two types of ecological succession

i) Primary succession: It involves the gradual establishment of biotic communities on a lifeless ground.

(a) Hydrarch (or) Hydrosere: The establishment starts in a watery area like pond and lake.

(b) Xerarch (or) Xerosere: The establishment starts in a dry area like desert and rock.

ii) Secondary succession: It involves the establishment of biotic communities in an area, where some type of biotic community is already present.

10. What are the types of food pyramids?

There are three types such as Pyramid of numbers, pyramid of energy and pyramid of biomass.

11. What are the classifications of ecosystems?

Forest ecosystem, grassland ecosystem, desert ecosystem and aquatic ecosystem.

12. What is meant by food chain?

It is the flow of energy accepted by consumers form producer. The sequence of eating and being eaten in an ecosystem is known as food chain..

13. What is meant by food web?

The interlocking pattern of various food chains in an ecosystem and there are number of opportunities for eating and being eaten at each tropic level is known as food web.

14. What is meant by biodiversity? (DEC-2005)

It is the number, variety and variability. It is defined as the sum total of species richness, ie., the number of plants, animals and microorganisms occurring in given region, country, continent or on earth.

15. What are the classifications of biodiversity?

Genetic biodiversity, Species biodiversity, Ecological biodiversity and Landscape biodiversity.

16. What are the energy flow or energy exchanges in an ecosystem?

Photosynthesis and respiration by the organisms for maintaining life process.

17. What is meant by genetic biodiversity? (DEC 2007,08,09,MAY 2008)

It is the sum of genetic information stored in the genes of individuals of plants animals and

microorganisms.

18. What is meant by species biodiversity?

It is the population within which genes flow occurs under natural conditions.

19. What are the types of forest ecosystems?

Tropical rain forests, tropical deciduous forests, tropical shrub forests, temperate rain forests and temperate deciduous forests

20. What is meant by landscape biodiversity?

It involves spatial arrangement of habitants across a large area includes the flux of energy, nutrients, disturbances and organisms across the area.

21. What is meant by biomes? Give some examples.

Biomes could be considered by life zones, environments with similar climatic, topographic and soil conditions and roughly comparable biological communities. Some of these are forest ecosystems, grassland ecosystems, desert ecosystem and aquatic ecosystems.

22. What are the types of grassland ecosystems?

Tropical grasslands, temperate grasslands and polar grasslands..

23. What are the classification of wetlands?

Swamps, Marshes, Bogs and fens.

24. What is meant by estuaries?

Estuaries are bays or semi-enclosed bodies of brackish (moderately salt) water that form where rivers enter the ocean.

25. Explain Biosphere

The part of lithosphere, hydrosphere and atmosphere in which living organisms live and interact with one another is called biosphere.

26. What are biodiversity inventories?

It is a well documented inventories and assessments of current conditions, abundances, distributions and management directions are needed for genetic resources, species populations, biological communities and ecological systems. Intensive inventories, broad based inventory efforts, surveys and rapid assessment programs are carried out to meet the above targets.

27. What are the functions of lithosphere?

It is a home for human beings and wildlife. ii). It is a storehouse of minerals and organic matters.

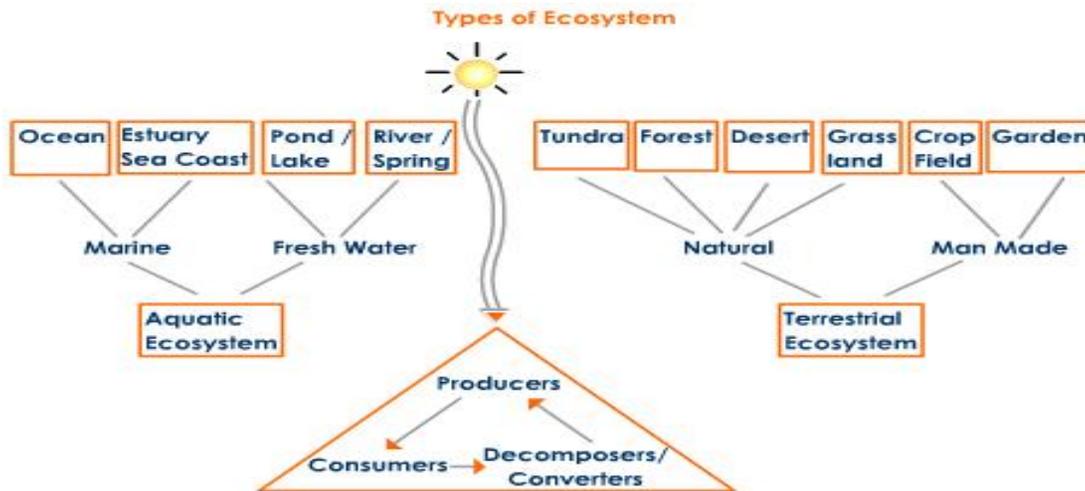
28. What are the types of energy models?.

Universal energy model, Single channel energy flow model, Double channel or Y-shaped energy flow models.

29. What are wetlands and what are the types of wetlands?

Wetlands are ecosystems in which the land surface is saturated or covered with standing water at least part of the year. They can be classified into three major categories such as swamps, marshes and Bogs and fens.

30. What are the types of ecosystems?



31. What are types of aquatic ecosystems?

It is classified into fresh water ecosystems and marine ecosystems. The fresh water ecosystems is classified into two types such as lentic ecosystems (lake, pond, ditch, swamp) and lotic (river, spring, stream) ecosystems.

32. State the significance and scope of environmental education. (DEC 2009,DEC 2008)

Significance

- i). Environmental studies inform the people about their effective role in protecting the environment by demanding changes in laws and enforcement systems
- ii). Environmental studies have a direct relation to the quality of live we live.
- iii). Environmental studies develop a concern and respect for the environment.

Scope

- i. To get awareness and sensitivity to the total environment and its related problems.
- ii. To motivate the public participation in environment protection and improvement.
- iii. To develop skills for identifying and solving environmental problems
- iv. To know the necessity of conservation of natural resources.

UNIT III

NATURAL RESOURCES

1. Define pollution?

Pollution is defined as excessive discharge of undesirable substances to the environment, adversely altering the natural quality of the environment and causing damage to biomass, plants and animals.

2. Describe air pollution and state the classifications of air pollutants. (DEC 2008,09)

The air pollution which occurs in the troposphere level is mainly due to the industries and vehicles, such a polluted air affects vegetation, promotes corrosion, blocks out sunlight and deterioration of rubber, paints, etc., There are two types primary pollutants released into the air in its original form (CO,NO, SO₂, etc..) and while secondary pollutants become subsequent to reactions in the air to form new pollutants (Ozone, SO₂, Aldehydes, Ketones, Peroxyacyl nitrate, etc..).

3. What are the sources of air pollution?

The natural sources (volcanic eruptions, forest fires, biological decay, sources of radioactivity in atmosphere) and manmade sources (Anthropogenic) such as fossil fuel burning, vehicular emissions, power plants, agricultural activities, etc.,

4. What are organic pollutants?

They are polychlorinated biphenyl and DDT (Dichloro Diphenyl Trichloroethane, a pesticide).

5. What is meant by carbon monoxide?

It is colorless, odorless flammable gas which is a product of incomplete combustion.

6. What are the sources of Sulphur dioxide?

The sources of SO₂ are from the industries and manmade activities.

7. What are the sources of nitrogen oxides?

Anthropogenesis and eruption of volcanoes are the sources of NO₂.

8. What are water pollution sources?

They are classified as point sources which are discharged pollutants at specific locations through pipes, ditches or sewers into bodies of surface water and non point sources that can not be traced to any single site of discharge, usually large land areas or air sheds that pollute water by run-off, subsurface flow or deposition from the atmosphere.

9. What is meant by BOD and COD?

The amount of oxygen consumed by the microbes is BOD (Biological Oxygen Demand). It is the amount of dissolved oxygen required by microorganisms to breakdown organic matter present in water. COD is the amount of oxygen required for chemical oxidation of organic matter using some oxidizing agent like K₂Cr₂O₇ and KMnO₄

10. What is meant by municipal sewage?

It is a complex mixture of suspended and dissolved materials constitutes mainly of organic.

11. What is meant by waste water treatment?

It is process of water treatment classified as primary and secondary and tertiary treatment.

12. What is meant by noise?

Sound is the mechanical energy from the vibrating source. The unpleasant and unwanted sound is called noise expressed in Hertz (Hz) is equal to the number of cycles per second. Decibel scale is measured for loudness.

13. What are the effects of noise pollution?

The interference with man's communication, hearing damage, physiological and psychological changes is the effects of noise pollution.

14. Define water pollution.

It can be defined as alteration in physical, chemical or biological characteristics of water making it unsuitable for designated use in its natural state.

15. What are the major sources of surface water pollution?

Sewage, Industrial influents, Synthetic detergents, Agrochemicals, Oil and waste heat are the sources of

surface water (streams, lakes and estuaries) pollution.

16. Define hazardous wastes. (DEC 2006,09)

The toxic chemicals, radioactive or biological substances contributing increase in mortality or serious irreversible illness to human health and environment are called hazardous wastes.

17. Describe ground water pollution.

Ground water pollution with arsenic, fluoride and nitrite are posing serious health hazards by the sources of septic tanks, industries like textile, chemical, tanneries), deep well injection, mining, etc.,

18. Define thermal pollution. (DEC2005)

Thermal pollution is defined as the presence of waste heat in the water which can cause undesirable changes in the natural environment.

19. What are the effects of thermal pollution?

Decreasing of dissolved oxygen content, barrier of oxygen penetration into deep cold waters, toxicity of pesticides, composition of flora and fauna changes, fall of oxygen level due to increase in metabolic activities of aquatic organisms, discharge of heated water near the shores disturbing spawning and even killing small fishes and fish migration from the thermal zones.

20. What are the sources of marine pollution? (JUNE 2005)

Rivers, Catchment area and Oil drilling and shipment

21. What are the sources of soil pollution? (DEC 2010)

Domestic and industrial wastes, „Fly ash “ of thermal power plants, pesticides in nature and agrochemicals and the radioactive substances in the soil are the sources of soil pollution.

22. What are the causes of soil pollution?

Urban or domestic wastes, commercial wastes, industrial wastes, hazardous wastes, biological wastes.

23. What are the major causes of water pollution?

- i) Pesticides and insecticides in agricultural fields.
- ii) Heavy metals, mercury and toxic chemicals from industries.
- iii) Domestic wastes, crude oil, plastics, etc.
- iv)Waste water from nuclear and thermal plants.

24. Differentiate between recycling and reuse.

Recycling is the reprocessing of the discarded materials into new useful products.

Example: Preparation of cellulose insulation from paper.Reuse means the discarded materials like refillable container, rubber, etc., are used again after use. i.e., it can be reused.

25. What are the sources of radioactivity?

Natural sources and anthropogenic (manmade) sources are the sources of radioactivity.

26. What are the harmful changes in cell and genetic level by ionization radiations?

Genetic damage and Somatic damage

27. What are the classifications of solid wastes? (DEC 2006,JUNE 2007)

Municipal, industrial, agricultural, medical, mining waste and sewage sludge

28. What are the sources of urban and industrial wastes?

Waste from homes, Waste from shops, biomedical waste, construction or demolition waste, Horticulture waste and waste from slaughter houses

29. What are the types of urban solid wastes?

Biodegradable wastes and non-biodegradable wastes

30. What are 'three R's' in management of solid waste?

Reduce, recycle and reuse before destruction and safe storage of wastes.

31. What are the methods adopted for discarding wastes?

Sanitary landfill, composting and incineration are the methods adopted for discarding wastes.

32. Write any four major water pollutants.

- i) Pesticides and biocides.
- ii) Heavy metals, mercury, crude oil, plastics.
- iii) Industrial and agricultural wastes.
- iv) Thermal pollution. .

33. Define photochemical smog

The brownish smoke like appearance that frequently forms on clear, sunny days over large cities with significant amounts of automobile traffic

34. Define disaster

It is a geological process and it is defined as an event concentrated in time and space, in which a society or sub-division of society undergoes severe danger and causes loss of its members and physical property.

35. Define flood

Whenever the magnitude of water flow exceeds the carrying capacity of the channel within its banks, the excess of water overflows on the surroundings causes floods.

36. Define Tsunami

Tsunami is a Japanese word which means "harbor wave". „Tsu“ means "harbor" and „nami“ means "wave". A Tsunami is large waves that are generated in a water body when the sea floor is deformed by seismic activity. This activity displaces the overlaying water in the ocean.

37. How does earthquake occurs?

The earth's crust has several tectonic plates of solid rock. These plates move slowly along the boundaries. When friction prevents these plates from slipping, stress develops and results in sudden fractures along the fault lines within the plates. This causes earthquakes and the violent vibrations in the earth.

38. What are landslides?

The movement of earth materials like coherent rock, mud, soil and debris from higher region to lower region due to gravitational pull is called landslides.

39. What are the main causes of environmental pollution?

Increasing human population, expanding industrial activities, careless human habits and natural calamities.

40. What are coral reefs? Why they are important?

The coastal zones contain rich heritage, coral reefs, wetlands and sea grass beds. The coral reefs support more than one million species. They provide feeding, breeding and medicines to fishes. The coastal wetlands and grass beds provide habitats and support for over 2000 species of fishes and plants.

The agricultural and industrial chemicals and also the rising ocean temperatures affecting the coral reefs. The wetlands and grass beds are destroyed by coastal development activities.

41. What is meant by SPL (Sound Pressure Level)?

The noise measurements are expressed in terms of SPL which is logarithmic ratio of the sound pressure to a reference pressure. It is expressed as dimensionless unit, decibel (dB).

The international reference pressure of 2×10^{-5} Pa is the average threshold of hearing for a healthy ear. When a noise is beyond 120 dB, it causes noise pollution.

UNIT IV

SOCIAL ISSUES AND THE ENVIRONMENT

1. Explain sustainable development and unsustainable development.(DEC 2008,09)

Sustainable development means all the natural resources must be available for present generation and future generation also. It is the relationship between human beings and resources they depend on for all their developmental activities.

Unsustainable development means degradation of environment due to over utilization and over utilization and over exploitation of natural resources.

2. Define watershed.

Watershed is defined as natural hydrologic entity that covers a specific expanse of land surface from which the rainfall runoff flows to a defined drain, channel, stream or river at any particular point.

3. Define watershed management.

The land water flows across or through on its way to a common stream, river, lake, pond or reservoir under the influence of gravity. The management of rainfall and resultant run-off is called watershed management.

4. Define Environmental ethics

Environmental ethics is the science of human duty towards environment i.e., the moral relationship between humans and environment.

5. What is meant by Inter-generational and Intra-generational equity?

Inter-generational equity states that we should hand over a safe, healthy and resourceful environment to our future generations.

Intra-generational equity states that the technological development of rich countries should support the economic growth of poor countries and help in narrowing the wealth gap and lead to sustainability.

6. What are the major global effects of air pollution?

Green house effect, Depletion of ozone layer, Acid rain

7. What is meant by rainwater harvesting?

Collecting rainwater when and where it falls for use during non-monsoon months is called rainwater harvesting.

8. Write any two methods of rainwater harvesting.

Roof water harvesting, Construction of percolation or recharge well cum bore.

9. What is meant by water conservation?

The process of saving water for future utilization. These practices that encourage consumers to reduce the use of water. Since the water is important component to human survival and all other commercial and agricultural activities, it is essential to conserve the water resources.

10. Write any two principles of ethical conduct.

- i. We should not harm any natural entity that has an intrinsic worth.
- ii. We should not try to mislead any animals capable of being misled.

11. What are the green house gases and their percentages?

The major green house gases such as water vapor, carbon dioxide (60%), Sulphur dioxide, nitrous oxide (6%), methane (12%) and chlorofluoro carbons (22%).

12. Define green house effect.

- The green house effect is defined as the natural warming effect of the troposphere. The green house gases such as water vapor, carbon dioxide, sulphur dioxide, nitrous oxide, methane and chlorofluoro carbons are allowing the sunlight to pass through the troposphere.
- The green house gases which contribute to the mean global surface temperature is called greenhouse effect. The earth's surface absorbs this solar energy and transforms into infrared radiation (heat), which then rises to troposphere.

13. What are the effects of ozone depletion?

Effect on climate, effect on human being, effect on biotic communities

14. What do you mean by acid rain or acid precipitation?

Acid rain is caused when coal/oil is burnt. When the pH decreases below range of 7 it causes acid rain. Both fuels contain certain amount of S and N which are released on combustion and rise into the air as SO₂ and NO_x gas, when these gases are released from the industries and power plant.

15. What are the environmental consequences of acid rain?

Acidification of soil, Acidification of surface water, Acidification of ground water, effect of acid rain in plants, effect of acid rain on minerals.

16. Define resettlement.

Resettlement is simple relocation or displacement of human population without regard to their individual, community or social needs.

17. Define rehabilitation.

It involves replacing the lost economic assets, rebuilding the community system that has been weakened by displacement, attending to the psychological trauma of forced alienation from livelihood.

18. Define wasteland

It is defined as which is lying uninhabited, uncultivated and left after use or land which is no longer serving any purpose. It is overgrazed pastures and struck and eroded valleys.

19. Define consumerism

An organized movement of citizens and government agencies to improve the rights and power of buyers in relation to sellers.

20. What are the types of waste land?

Cultivable wastelands: These lands are used for cultivation, grazing and other agricultural purposes (Examples: Degraded forest lands, water logged lands, saline lands, gullied lands, etc.)

Uncultivable wastelands: These lands are not used for cultivation, grazing settlement and infrastructure development. (Examples: Barren lands, hilly slopes, stony or gully land, sandy deserts, etc.)

21. What is meant by Ozone?

It has three oxygen atoms which is more reactive chemical than oxygen. The ozone occupies throughout atmosphere but it is highly concentrated in the stratosphere between 20 to 50 km above the earth's surface as a ozone layer.

22. What is meant by environmental audit? (DEC 2008)

It is intended to quantify environmental performance and environmental position; they perform analogous to financial audits. It also aims to define what needs to be done to improve on indicators of such performance and position.

23. What is Dobson unit?

The amount of atmospheric ozone is measured by Dobson unit 1 DU is equal to 0.01 mm thickness of pure ozone at the density it possess if it is brought to the ground level.

24. What is meant by ozone layer hole?

The main source is the halo carbons which makes a hole in the fragile ozone layer.

25. What is meant by global warming?

The increased amounts of CO₂ and other green house gases such as water vapor, carbon dioxide, sulphur dioxide, nitrous oxide, methane and chloro fluoro carbons into the atmosphere due to human activities increases the average global temperature of the atmosphere. The green house gases in the troposphere can enhance the greenhouse effect on the earth surface and lead to global warming. Hence, the green house gases cause global warming.

26. What is nuclear winter?

When the nuclear bomb explodes, it creates an immense heat and light would ignite all combustible materials and produce large quantity of black soot will be carried to the stratosphere. Black soot will absorb all UV radiation to reach the earth. The water evaporation will also reduce. The cooling effect opposite to the global warming due to the nuclear explosion is called nuclear winter.

27. How Chloro fluoro carbon (CFC) is accumulated in atmosphere?

Aerosol propellants, Cleaning solvents, Fire extinguishers, Refrigerants (Freon), Foam plastic blowing agent.

28. What are the advantages of rain water harvesting? (DEC 2008, MAY 2008)

- i. The ground water is recharged and its quality is improved.
- ii. Surface water quality is also improved due to diversion of rainwater induced run-off.
- iii. Mitigating the effects of floods, drought and soil erosion.

- iv. Enough water consuming is maintained during summer period.
- v. Increasing the availability of water from well.
- vi. Rise in the ground water level.
- vii. Upgrading the social and environmental status

29. What is meant by ISO 14000? (DEC 2008)

It is an environmental standard which exists to help organizations minimize how their operations negatively affect environment and comply with applicable laws and regulations.

30. What is the role of Non Government Organizations (NGO?)

It can help by advising the government about local issues and interacting with the grass root level people. Example: Chipko movement and Narmada Bachao andolan.

31. What is meant by CDM.(Clean development mechanism)

It is arrangement under the Kyoto protocol allowing industrialized countries with a greenhouse gas reduction commitment to invest in projects that reduce emissions in developing countries.

32. What is nuclear holocaust?

Nuclear holocaust means destruction of biodiversity by nuclear equipments and nuclear bombs. Large level destruction can happen; when a reactor core melts down at nuclear war leads to large number of living beings are totally died.

33. What are the methods to create public environmental awareness?

- i) Among the students through education.
- ii) Among the masses through mass media.

34. What is meant by waste land reclamation?

The land which is incapable of rising corps or poor economic value. i.e., the land which is not in use is called as wasteland. It is unproductive, unfit for cultivation and grazing. About 20% of the geographical area of India is wasteland. The main significance of wasteland is the ecological imbalance of an ecosystem of the given area.

35. What are the objectives of waste land reclamation?

- i. Increasing population and cattle in India will increase the demand for food, land, shelter and other resources.
- ii. To prevent soil erosion, landslides, flooding and drought.
- iii. To avoid over-exploitation of natural resources.
- iv. To conserve the biological resources and natural ecosystems.

36. What are the causes of green house effect?

- i. Combustion of fossil fuels.
- ii. Clearing forests, growing crops.
- iii. Increasing human population.
- iv. Increasing industrial activities.
- v. Increasing automobiles.

UNIT V

HUMAN POPULATION AND THE ENVIRONMENT

1. Define human population.

Total number of individuals of the same species occupying a particular geographical area at a given time is called human population. For example, the human population in a country is the number of human beings present in the country.

2. Define population density?

It is expressed as the number of individuals of the population per unit area or unit volume.

3. What is meant by population dynamics?

Population dynamics deals with the trends of growth of population with time. The statistical study of human population is known as demography.

4. What is meant by population explosion? (DEC 2008,09)

The sudden increase in population excessive rate due to high birth rate (natality) and low death (mortality) rate is termed as population explosion. India is in the verge of population which causes poverty.

5. What is natality?

It is term which encompasses the production of new individuals by germination.

6. What are the causes of population explosion?

- i. High birth rate (natality) and low death(mortality) rate
- ii. Low life expectancies
- iii. Advances in public health
- iv. Illiteracy

7. Define the terms Migration, Immigration and Emigration. (DEC 2009)

- Rate of population change for a specific area which is affected by the movement of people into other areas is called Migration.
- If the movement of people within local area is called Immigration.
- If the movement of people from original population of new areas is called Emigration

8. Define population equilibrium. (DEC 2006)

A state of balance between birth rate and death rate in a population is known as population equilibrium.

9. What is meant by family planning programme? (DEC 2009)

It is a programme that works on checking the population explosion. Family planning is directly related to the health and welfare of women and prosperity of nation. Family planning services and education among women has supported declining fertility rates in southern India and Srilanka.

10. What is HIV? How it infects humans. (DEC 2008)

It is Human immune deficiency virus and it depletes the body's immunity and infects through blood contacts.

11. What is meant by NIMBY syndrome?

NIMBY means Not in My Back Yard which describes the opposition of residents to the nearby location of something they consider undesirable even if it is clearly a benefit for the many.

12. What is meant by AIDS?

It is Acquired immuno deficiency syndrome.

13. Define doubling time.

It is the time required for a population to double its size at a constant annual rate.

T_d (doubling time) = $70/r$; r = annual growth rate.

14. State the role of information technology in environment. (DEC 2009, JAN 2009)

It plays a vital role in the field of environmental education which used in collecting processing storage and dissemination of information. A number of software have been developed so study about the environment.

15. Write the expansion for HIV AND AIDS.(DEC 2008)

HIV: Human Immuno deficiency Virus.

AIDS:Acquired Immuno Deficiency Syndrome.

16. What are the major precautions to avoid AIDS? (DEC 2008,MAY 2008)

- i. To prevent blood borne HIV transmission.
- ii. Avoid indiscriminate sex and encourage the use of condoms and also avoid the use of sharing razors.

17. Define Human rights.

They are the fundamental rights which are possessed by all human beings irrespective of their caste, nationality, sex and language.

18. What are the major symptoms of AIDS?

Fever for more than one half month, Diarrhea for more than one month and weight loss more than 10% of body weight is the major symptoms of AIDS

19. What are the screening tests for AIDS?

Elisa test and Western Blot test

20. What are the main declarations of universal Human rights?

- | | |
|--------------------------------------|---------------------------|
| (i) Right to freedom. | (ii) Freedom of religion. |
| (iii)Right to culture and education. | (iv) Right to equality. |

21. What is meant by Value Education?

It is an instrument used to analyze our behavior and provide proper direction to our youths. The new education policy should be designed so as to improve human values, environment and standard of living of the people.

22. What are the objectives of Value education?

- i) To improve the integral growth of human beings.
- ii) To create awareness about values and their significance.

23. What are the types of values?

- | | |
|-----------------------|-------------------------|
| (i)Universal values | (ii)Individual values |
| (iii)Spiritual values | (iv)Personal values |
| (v)Social values | (vi)Moral values |
| (vii)Spiritual values | (viii)Behavioral values |

24. Name the various organizations towards women welfare?

- i) National Network for women and mining (NNWM).

ii) International convention on the Elimination of All forms of Discrimination against women.

25. What is IT?

It is in which information is transferred, recorded, edited, stored and manipulated and disseminated with enormous quantities in the minimum possible time.

26. What are the applications of GIS?

Data related to environment.

UNIT -I

1. Define Hazards. What are the types and explain their health effects.
2. Explain the components, Characteristics and biodiversity of Forest ecosystem
3. Explain the structure and functional features of aquatic, desert and grassland ecosystems.
4. Explain oxygen and nitrogen cycle in detail.
5. What are the threats faced by biodiversity. What are the solutions for the threats?
(or) how will you conserve bio-diversity?
6. Explain in detail the energy flow through the ecosystem.
7. Discuss the threats faced by Indian biodiversity.
8. Write a note on the endangered and endemic species of India.
9. What are the impacts of biodiversity loss?
10. Define the term hot spot in biodiversity. Explain any two in detail.

UNIT-II

1. Mention the sources and effects of various air pollutants. Also describe the method of control of air pollution.
2. (i) Briefly describe the sources effects and control of noise pollution.
(ii) Discuss about OZONE layer depletion.
3. Enumerate with example the major sources of surface and ground water pollution.
4. (i) Explain the method of sewage water treatment.
(ii) How acid rain is formed? Explain its impact.
5. What are the major sources of soil pollution? And what are the measures to be taken to prevent soil pollution?
6. Explain in detail the Solid waste management techniques and the disposal of MSW.
7. (i) Explain any two case studies on Nuclear pollution. (ii) Explain in detail about radioactive pollution.
8. What are the sources, effects & control measures of Marine pollution?
9. Explain the methods of disposal of municipal solid waste. Write notes on disposal of radio-active wastes.
10. (i) What are the causes of soil erosion and methods of preventing it.
(ii) Describe case study on industrial pollution.

UNIT-III

1. Explain in detail about forest resources, its functionality and benefits.

2. What is deforestation? What are the causes of deforestation? And explain their impact on the environment.
3. (i) Brief about timber extraction and its consequences.
(ii) What is mining explain its types.
4. (i) What are dams and explain their effects on forest and tribal people. Explain with any one case study.
(ii) Mention the benefits and problems in constructing a dam.
5. (i) Discuss in detail about water Resources. (ii) Discuss about desertification.
6. Briefly explain in detail about mineral resources.
7. (i) Explain in detail about Food resources. (ii) What are the adverse effects of agricultural practices.
8. Describe in detail about Renewable and nonrenewable energy resources.
9. Discuss in detail about energy conversion process.
10. (i) Explain in detail about soil erosion and its types. (ii) Briefly explain about biochemical degradation of pollutants.

UNIT-IV

1. State the provisions in Environment protection act, Air Act and water act.
2. (i) Explain in detail about sustainable Development. (ii) Discuss about bio medical waste
3. (i) Discuss in detail about water Conservation. (ii) Explain in detail the concept of Green chemistry
4. Describe in detail the role of NGO.
5. What is meant by environmental ethics, mention the functions of environment and the problems and issues.
6. Explain with any case study about the nuclear Accidents and Holocaust
7. (i) Describe about Waste land development and the need for it.
(ii) Describe the objectives of consumerism.
8. Discuss in detail about Water Act and Wildlife, Forest Act.
9. Explain the concept of Disaster Management with an example case study.
10. (i) What are the issues involved in Environmental legislation.
(ii) How public awareness is done to conserve the environment.

UNIT-V

1. (i) Explain the population characteristics & variations among nations
(ii) What is meant by population explosion? Discuss the Indian Scenario.
2. What is meant by population stabilization? Discuss the family welfare and family planning in Indian context.
3. Discuss the influence of environmental parameters and pollution on human health.
4. (i) What is Universal declaration of Human rights? What is its importance in achieving the goals of equity, justice & sustainability.

- (ii) Discuss the salient features of Draft declaration of Human Rights on environment.
5. What are the objectives & elements of Value-education? How can the same be achieved?
6. (i) Briefly discuss HIV/AIDS, mode of its spread and its effect on environment.
(ii) Discuss various issues & measures for Women & Child Welfare at International & National level.
7. What is the role of NMIS, ENVIS & GIS in dissemination of environmental information and environmental management?
8. Explain the role of Information Technology in environment & Human health with a case study.
9. (i) Discuss the environmental and social impacts of growing population.
(ii) Write briefly on the effect of increasing affluence on environment.
10. (i) Write briefly on implementation of family planning programme.
(ii) Discuss the factors influencing the family size.