

Unit I ENVIRONMENT, ECOSYSTEMS AND BIODIVERSITY**Part - A Questions****PART – A****1. Define environment.**

The word environment is derived from the French word “Environ” meaning “Surroundings”. Each and everything around us is called as environment. It is defined as “the sum of total of all the living and non-living things around us influencing one another.” Each organism is surrounded by materials and forces which constitute its environment, from which it must derive its needs. Environment creates favourable conditions for the existence and development of living organisms.

2. What is Environmental science?

Environment is defined as “the sum of total of all the living and non-living things around us influencing one another.” Environmental Science is the study of the environment its biotic (ie., biological) and abiotic (ie., non-biological) components and their interrelationship. The living components of the environment are called biotic components. The non-living components of the environment are called abiotic components

3. Write the Scope of environmental studies.

Scope of environmental studies:

To get an awareness and sensitivity to the total environment and its related problems.

To motivate the active participation in environmental protection and improvement.

To develop skills for identifying and solving environmental problems.

To know the necessity of conservation of natural resources.

To evaluate environmental programmes in terms of social, economic, ecological factors.

4. Write the importance of risk and hazards.

One of the most important changes in environmental policy in the 1980s was the acceptance of the role of risk assessment and risk management in environmental decision making. In early environmental legislation, such as the clean air and clean water acts, the concept of risk is hardly mentioned; instead, these acts required that pollution standards be set that would allow adequate margins of safety to protect public health.

5. What is biome?

The kind of organisms which can live in a particular ecosystem depends on their physical and metabolic adaptation to the environment. On earth there are many sets of ecosystems which are exposed to same climate conditions and having dominant species with similar life cycle, climatic adaptations and physical structure. This set of ecosystem is called a biome. The biome is a small ecosystem within an ecosystem.

6. What are the structures or components of ecosystem?

The structure of an ecosystem explains the relationship between the abiotic and the biotic components.

An ecosystem has two major components

- (i) Abiotic components
- (ii) Biotic components

7. What are biotic and abiotic components of an ecosystem?

The non- components of an ecosystem collectively form a community called abiotic components. Eg: physical components- sunlight is necessary for photosynthesis

Water is essential for living things

Temperature is necessary for survive

Soil provides base and nutrients

Chemical components- carbohydrates, protein, liquids, nitrogen phosphorous, potassium and oxygen.

Biotic components:

The living organisms in an ecosystem collectively form its community called biotic components. Eg: autotrophic components- green plants, trees

heterotropic components- man, rabbit, tiger, fox

8. How does biome differ from an ecosystem?

The kind of organisms which can live in a particular ecosystem depends on the physical and metabolic adaptations to the environment of that place.

On earth there are many sets of ecosystems which are exposed to same climatic conditions and having dominant species with similar life cycle, climatic adaptations and physical structure.

This set of ecosystem is called a biome

9. What are autotrophic and heterotrophic components?

The members of autotrophic components are producers, which are autotrophs. They derive energy from sunlight and make organic compounds from inorganic substances. Examples are green plants, algae, bacteria, etc.,

The members of heterotrophic components are consumers and decomposers, which are heterotrophs. They consume the autotrophs.

10. What is meant by nitrification and de-nitrification?

Nitrification:

The conversion of ammonia into nitrates is termed as nitrification. This is brought about by nitrifying bacteria.

Eg: nitrobacter, nitrosomonas

De- Nitrification:

The conversion of nitrates into nitrogen is termed as de-nitrification. This process is brought about by denitrifying bacteria.

Eg: pseudomonas, fluorescence.

11. What is ecological succession? Mention their types.

Ecological succession:

It is defined as the progressive replacement of one community by another till the development of stable community in a particular area is called ecological succession.

Types of ecological succession:

Primary succession: it involves the gradual establishment of biotic communities on a lifeless ground.

(a) Hydrarch- establishment starts in a watery area like pond and lake.

(b) Xerarch- establishment starts in a dry area like desert and rock.

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

12. What are all the stages of ecological succession?

Stages of ecological succession:

Pioneer community: The first group of organism, which establishes their community in the area, is called pioneer community.

Seres (or) Seral stage: The various developmental stages of a community are called 'seres'. Community: It is the group of plants or animals living in an area.

13. Write the characteristics of forest ecosystem.

Characteristics of forest ecosystem:

Forests are characterized by warm temperature and adequate rainfall, which make the generation of number of ponds, lakes.

The forest maintains climate and rainfall.

The forest support many wild animals and protect biodiversity.

The soil is rich in organic matter and nutrients, which supports the growth of trees.

14. Define keystone species.

Within a habitat each species connects to and depends on other species. But, while each species contribute to habitat functioning, some species do more than others in the overall scheme of things. Without the work of these key species, the habitat changes significantly.

These species are called keystone species. When a keystone species are disappears from its habitat, that habitat changes dramatically.

15. Define biodiversity.

Bio means 'life' and diversity means 'variety', hence, biodiversity refers wide variety of life on the earth. Our planet – earth contains more than 20 million species of organisms. But, of which only 1.4 million species have been identified so far. These species differ widely from one another. This variation in living organisms is called biodiversity. Biodiversity is defined as, "the variety and variability among all groups of living organisms and the ecosystem in which they occur."

16. Write the significance of biodiversity.

Biodiversity is very important for human life, as we depend on plants, micro – organisms, earth's animals for our food, medicine and industrial producers.

Biodiversity protects the fresh air, clean water and productive land.

It is also important for forestry, fisheries and agriculture, which depend on rich variety of various biological resources available in nature.

17. What is Point richness? Mention alpha and beta gamma.

Point richness: it refers to the number of species that can be found at a single point in a given space.

Alpha richness:

It refers to the number of species found in a small homogeneous area. It is strongly correlated with physical variables.

Beta richness:

It refers to the rate of change in species composition across different habitats. It means that the number of species increases as more heterogeneous habitats are taken into consideration.

Gamma richness:

It refers to the rate of change across large landscape.

18. What is the reason for rich biodiversity in tropics?

Reason for rich biodiversity in tropics:

The following are the reasons for the rich biodiversity in the tropics.

The tropics have a more stable climate.

Warm temperatures and high humidity in the tropical areas provide favorable conditions.

No single species can dominate and thus there is an opportunity for many species to coexist.

Among plants, rate of out – crossing appear to be higher in tropics.

19. India as a mega diversity nation. Justify?

India as a mega diversity nation:

Countries have the world's selected few rich floral land and faunal zones.

India is one among the 12 mega – diversity countries in the world.

It has 89,450 animal species accounting for 7.31% of the global faunal species.

It has 47,000 plant species which accounts for 10.8% of the world floral species.

The loss of biodiversity or endemism is about 33%.

20. What is endemic species?

The species which are confined to a particular area are called endemic species. Our country has a rich endemic flora and fauna. About 33% of the flowering plants, 53% of fresh water fishes, 60% amphibians, 36% reptiles and 10% mammalian are endemic species.

Plant diversity, marine diversity, agro- diversity, animal biodiversity.

21. What is red data book?

Red data book is a catalogue of taxa facing risk of extinction.

The purpose of preparation of red list is to

Provide awareness to the degree of threat to biodiversity.

Provide global index on already decline of biodiversity.

Identification of species at high risk of extinction.

Help in conservation action.

Information about international agreements.

22. Write the criteria for recognizing hot spots.

The hot spots are the geographic areas which possess high endemic species.

The richness of the endemic species is the primary criterion for recognizing hot spots.

The hot spots should have a significant percentage of specialized species.

The site is under threat.

It should contain important gene pools of plants of potentially useful plants.

23. What do you understand the term flora and fauna?

Flora: Plants present in a particular region or period.

Examples:

Sapriahimalayana, Ovarialurida, Nepenthes khasiana, Pedicularisparroter, etc.,

Out of 81,000 species of plant in our country a large number is endemic. About 62% amphibians and 50% lizards are endemic to Western Ghats.

Fauna: Animals present in a particular region or period.

Examples: Monitor lizards, reticulated phthon, Indian salamander and viviparous toad.

24. What are the two important bio diversity hot spots in India?

Eastern Himalayas 2. Western Ghats

Eastern Himalayas:

Geographically this area comprises Nepal, Bhutan, and neighboring states of Northern India. There are 35,000 plant species found in the Himalayas, of which 30% are endemic. Examples Rice, Banana.

Western Ghats:

The area comprises Maharashtra, Karnataka, Tamil Nadu and Kerala. Nearly 1500 endemic, dicotyledone plant species are found from Western Ghats. 62% amphibians and 50% lizards are endemic in Western Ghats.

25. What is endangered and endemic species? Give examples.

Endangered species: A species is said to be endangered, when its number has been reduced to a critical level. Unless it is protected and conserved, it is in immediate danger of extinction. Examples are Tortoise, Python, Indian wolf, Red fox, Tiger.

Endemic species: The species, which are found only in a particular region, are known as endemic species. Examples are Sapria Himalayan, Monitor lizards.

PART-B

1. Discuss in detail the energy flow in ecosystem. (8)
2. Explain the concepts of risk assessment. (8)
3. Give the types and process of ecological succession. (8)
4. Explain about the significance of nitrogen cycle and oxygen cycle in the ecosystem. (8)
5. Explain the role of producers, consumers and decomposers in an ecosystem. (8)
6. Write the features and characteristics of Grassland ecosystem. (8)
7. Explain the various components and functions of Forest ecosystem. (8)
8. Discuss the structure and components of Desert ecosystem. (8)
9. Explain the structure, components and function of fresh water ecosystem. (8)
10. Explain the structure, components and function of marine water ecosystem. (8)
11. Name and discuss the values that can be assigned to biodiversity. (8)
12. Explain the role of biodiversity at global, national and local levels. (8)
13. "India is a mega diversity Nation" – Discuss. (8)
14. Explain in brief various hot spots of biodiversity. (8)
15. Identify and explain the major threats to the biodiversity of India. (8)
16. What do you mean by endemic species? Name some endemic species of plants and animals in our country. (8)
17. Explain the in-situ conservation of biodiversity. (10)
18. Explain the ex-situ conservation of biodiversity. (6)
19. Write note on the bio-geographical classification of India. (8)
20. Write note on the importance of conservation of bio-diversity. (8)

UNIT-2 ENVIRONMENTAL POLLUTION

PART-A

1. Define Pollution.

Pollution may be defined as the unfavorable alteration of our surroundings. It changes the quality of air, water and land which interferes with the health of humans and other life on earth. Pollution are of different kinds depending on the nature of pollutant generated from different sources.

Eg: Industry, automobiles, thermal power plants, farming, nuclear reactors.

2. Mention the types of pollutants.

Types of Pollutants :

1. Bio-degradable pollutants- Bio-degradable pollutants decomposes rapidly by natural processes.
2. Non- Bio-degradable pollutants- Non- Bio-degradable pollutants do not decompose or decompose slowly in the environment.

The slowly decomposed materials are dangerous because it is more difficult to remove them.

3. Define air pollution.

Air pollution may be defined as the presence of one or more contaminants like dust, smoke, mist and odour in the atmosphere which are injurious to human beings, plants and animals.

4. What are the sources of air pollution?

Sources of air pollution – The sources of air pollution are of two types,

1. Natural sources- These pollutions are caused by natural sources.
Eg: Volcanic eruptions, forest fires, biological decay, pollen grains, marshes, radio activity materials.
2. Man- made sources- These pollutions are made anthropogenic activities.
Eg: Thermal power plants, Vehicular emissions, Fossil fuel burning, Agricultural activities.

5. What are the chemical composition of the atmosphere.

Composition of Atmospheric air –

Constituents	Percentage
Nitrogen	78 %
Oxygen	21 %
Argon (Ar)	< 1 %
CO ₂	0.037 %
Water vapour	Remaining

O ₃ , He, NH ₃	Trace amount
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6. How is photochemical smog formed? (A.U.Dec – 2006)

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

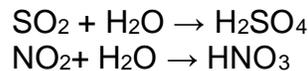
Sources – It is mainly due to chemical reactions among nitrogen oxides and hydrocarbon by sunlight.

Effects – It causes breathing problems, cough, eye, nose and throat irritation, heart diseases, reduce resistance to colds and pneumonia. Then Ozone can damage plants and trees. Smog can reduce visibility.

7. Mention the causes and effects of acid rain. (Chen A.U Dec 2008)

The rainfall with a pH less than 6.2 is called acid rain. This lowering of pH is due to the dissolution of acids in the rain water. Precipitation of oxides of sulphur and nitrogen with rain is termed as acid rain or acid deposition.

Causes – The primary cause of acid rain is sulphur dioxide. The gases, nitrous oxide, sulphur dioxide, due to burning of coal and oil, in the atmosphere, react with water to form acids.



8. How does ozone layer depletion take place? Write its consequences? (Chen. A.U.Dec 2009, A.U. June 2005)

Depletion of ozone occurs due to the presence of CO₂, CFC in the atmosphere.

Consequences:

1. Damage genetic materials in the skin cells, which cause skin cancer.
2. Affect the aquatic forms (fish).
3. Global warming.
4. Degradation of paints, plastics, etc.,

9. Explain the term global warming. (A.U.June 2007)

Global warming refers to an unequivocal and continuing rise in the average temperature of Earth's climate system. The increased inputs of CO₂ and other green house gases into the atmosphere from human activities will enhance the earth's natural green house effect of raising the average global temperature of the atmosphere near the earth's surface. This enhanced green house effect is called global warming.

10. What is meant by green house gases? (Chen A.U.Dec 2008)

A greenhouse gas (sometimes abbreviated GHG) is a gas in an atmosphere that absorbs and emits radiation within the thermal infrared range. Green house gases are gases (CO₂, CH₄, N₂O and CFCs) present in atmosphere, which absorb heat and do

not radiate, cause increase in atmospheric and global temperature. It is similar to the warming effect observed in the green house made of green glass.

11. Mention the sources of water pollution.

Water pollution is any physical, chemical and biological change in water quality that has a harmful effect on living organism or makes water unsuitable for desired uses. They are,

1. Infectious agents.
2. Oxygen demanding wastes.
3. Inorganic chemicals.
4. Organic chemicals.
5. Plant nutrients.
6. sediment.
7. Radioactive materials.
8. Heat
9. Point and Non- point sources.

12. What are the chemical parameters of water quality?

Chemical parameters of water quality -pH, hardness, presence of a selected group chemical parameters, biocides, highly toxic chemicals, and B.O.D are estimated.

pH is a measure of hydrogen ion concentration. It is an indicator of relative acidity or alkalinity of water. Values of 9.5 and above indicate high alkalinity while values of 3 and below indicate acidity. Low pH values help in effective chlorination but cause problems with corrosion. Values below 4 generally do not support living organisms in the marine environment. Drinking water should have a pH between 6.5 and 8.5. Harbour basin water can vary between 6 and 9.

B.O.D.- It denotes the amount of oxygen needed by micro-organisms for stabilization of decomposable organic matter under aerobic conditions. High B.O.D. means that there is less of oxygen to support life and indicates organic pollution.

13. How radioactive materials cause water pollution?

Radioactive materials – Radioactive isotopes of iodine, radon, uranium, cesium and thorium.

Causes- Nuclear power plants, mining and processing of uranium and other ores, nuclear weapons production and natural sources.

Effects- Genetic mutations, birth defects and certain cancers.

14. What is meant by Point & Non- point pollution?

Point sources- Point sources are discharged pollutants at specific locations through pipes, ditches or sewers into bodies of surface water.

Eg: Factories, sewage treatment plants, abandoned underground mines and oil tankers.

Non- Point sources- They are usually large land areas or air sheds that pollute water by runoff, subsurface flow or deposition from the atmosphere. Location of which cannot be easily identified.

Eg: Acid deposition and runoff of chemicals into surface water from croplands, livestock feedlots.

15. Define biological oxygen demand with its significance.

BOD is the amount of oxygen required for the biological decomposition of organic matter present in the water.

Significance of BOD:

1. It is an important indication of the amount of organic matter present in the river water.
2. Since complete oxidation occurs in indefinite period, the reaction period is taken as 5 days at 20⁰C. For all practical purposes, it is written as BOD₅.

16. Define chemical oxygen demand.

COD is the amount of oxygen required for chemical oxidation of organic matter using some oxidizing agent like K₂Cr₂O₇ and KMnO₄.

Significance of COD:

1. It is carried out to determine the pollutional strength of river water.
2. It is rapid process and takes only 3 hours.

17. Mention the specifications for drinking water.

1. Water should be clear and odourless.
2. It should be cool.
3. Turbidity of the water should not exceed 10 ppm.
4. The water must be free from disease- producing bacteria.
5. Water should be free from objectionable dissolved gases like H₂S.

18. Define soil pollution. (A.U.Dec 2010)

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

Composition of soil:

Components	%
Mineral matter	45
Organic matter	5
Soil water	25
Soil air	25

19. What are the major sources of solid waste ? (Chen. A.U Dec 2009)

Major sources of solid waste – Depending upon the nature, solid wastes can be broadly classified into three types,

1. Urban (or) Municipal wastes.
2. Industrial wastes
3. Hazardous wastes.

20. What is Marine pollution? (TNV AU Dec 2008)

Marine pollution is defined as, the discharge of waste substances into the sea resulting in harm to living resources, hazards to human health, hindrance to fishery and impairment of quality for use of sea water. Chemically it is a solution of 0.5 M NaCl and 0.005 M MgSO₄ containing traces of all conceivable matter in the universe. The coastal zones contain a rich heritage, coral reefs, wet land and seagrass beds.

21. What do you mean by coral reefs?

Coral reefs - Coral reefs are underwater structures made from calcium carbonate secreted by corals. Corals are colonies of tiny living animals found in marine waters containing few nutrients. Most of the coral reefs are built from stony corals.

Benefits of coral reefs –

1. Reefs support more than one million species.
2. They provide feeding, breeding and nursery areas to fish and shellfish.

22. What is meant by thermal pollution? (Chen AU Dec 2008, Dec 2009)

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. Thermal pollution is the degradation of water quality by any process that changes ambient water temperature.

23. How nuclear hazards can be disposed safely? (A.U. June 2007)

Radioactivity naturally decays over time, so radioactive waste has to be isolated and confined in appropriate disposal facilities for a sufficient period of time until it no longer poses a hazard. Disposal methods are the possible ways to distribute the radio-pollutants. These methods make the pollutant in a confined place to spread over a large space such that pollution can be weakened and its effects can be reduced.

24. State the role and responsibilities of an individual in the prevention of environmental pollution. (Chen A.U Dec 2008, Dec 2009)

1. Plant more trees.
2. Help more in pollution prevention than pollution control.
3. Use water, energy and other resources efficiently.
4. Purchase recyclable, recycled and environmentally safe products.
5. Use CFC-free refrigerators.
6. Use natural gas than coal.
7. Reduce deforestation.

PART- B

1. Define air pollution. What are the sources of air pollutants? Explain the approach to control of air pollution. (AU Dec 2005, 2007, 2008, 2012) (16 marks)

2. Discuss the phenomenon of global warming and the factors contributing to it. (A.U. May 2008) (8 marks)
3. How is acid rain formed? Explain its impact on environment. (Che. A.U. Dec 2009, May 2010) (8 marks)
4. What do you understand by ozone hole? What is the environmental impact of ozone depletion? (TNV AU Dec 2008) (8 marks)
5. Describe the phenomenon of green house effect. What are its effects? (A.U. Dec 2006, May 2007) (8 marks)
6. Explain the causes, effects and control measures of water pollution. (N/D 2011, M/J 2008) (16 marks)
7. With a flow diagram explain the various process of water treatment. (A.U. Dec 2007) (8 marks)
8. Briefly describe the sources, effect and prevention of soil pollution. (AU May 2007) (8 marks)
9. Discuss about the significance of hazardous waste management. (TNV A.U. Dec 2009) (16 marks)
10. Discuss various sources of marine pollution. How can you prevent pollution of our oceans? (M/J-2012, N/D-2011, 2009) (16 marks)
11. Explain the concept of sources, path receiver in the control of noise pollution. (Che. A.U. Dec 2009) (8 marks)
12. Explain the sources, effects and the control measures of radioactive pollution. (A.U. May 2006) (16 marks)
13. Illustrate the role of an individual in prevention of pollution.. (May 2012, Dec 2011, 2010, 2009, 2008) (8 marks)
14. Write briefly on Bhopal disaster and Chernobyl disaster. (N/D 2009) (8 marks)

UNIT- 3 NATURAL RESOURCES

PART - A

1. List out the functions of forests. (Dec 2007)

Forest performs important functions both to humans and to nature.

Habitats to millions of plants, animals, wildlife.

- Recycle rainwater & remove pollutants from air.
- Control water quality and quantity and help to maintain humidity.
- Prevent soil erosion and perform watershed functions.
- Promote tourism and contribute aesthetic beauty.

2. Write about commercial uses of forests. (Dec 2009, Dec 2013)

Forest provides us a large number of commercial goods.

- Forest supply wood- used as fuel.
- Wood for industries- raw materials as pulp, paper, board, timber etc.
- Minor forest products- gums, resins, dyes.
- Many plants- prepare medicine and drugs.
- Animal products- honey, ivory, hides etc.
- Forest lands – mining, grazing, recreation and for dams.

3. Write a short note on ecological uses of forests.(Jun 2013)

Production of oxygen -during photosynthesis trees produce oxygen.

- Reducing global warming - carbon dioxide is absorbed by the trees.
- Soil conservation- roots binds the soil tightly.
- Regulation of hydrological cycle-watershed in forest slowdown the runoff.
- Pollution moderators-absorbs toxic gases, noises.
- Wildlife habitat – wild animals and plants.

4. List out the causes of deforestation.

- Development Projects: Big dams, hydroelectric projects, road construction.
- Mining operations: Mica, coal, manganese, limestone.
- Raw materials for industries: wood
- Fuel requirements: both tribal and rural people need of fuel wood
- Shifting cultivation: Replacement of natural forest ecosystem
- Forest fires: Due to human interruption and ambient temperature.

5. “Deforestation causes soil erosion, landslides”. Justify (Jan 2006)

There are number of environmental problems associated with deforestation. On a local

level, the protective tree cover plays a important role in the water cycle. The water taken up by the trees reduces the amount available for surface run-off. When deforestation occurs, surface run-off increases. This situation can lead to severe problems of accelerated soil erosion and landslides.Eg: Mountains regions of Nepal and Northern India.

6. What is meant by timber extraction? Mention the need for it.(Dec 2013)

Timber extraction is the cutting of trees. It is also called logging. Timber extraction is done for

- Making furniture, doors & windows.
- For railway sleepers and carriages.
- Construction of boats and ships.
- Construction of carts and carriages.

7. Write about the problems of construction of dam on Forests.(Nov/Dec 2005, Jan/2006)

- Thousands of hectares of forest have been cleared.
- Due to Dam construction, the forest is also cleared for residential accommodation, office building, storing materials and laying roads.
- Hydroelectric projects provide opportunities for the spread of water borne diseases.
- Killing of wild animals and destroying aquatic life.

8. Write a note on problems of construction of dam on Tribale people.(Nov/Dec 2005, Jan/2006)

- Displacement of tribal people, such a biodiversity cannot be tolerated.
- It affects the tribal people both mentally and physically, modern food habits.
- Tribal people ill-treated by the modern society & they have not recognized.
- Tribal people and culture cannot be questioned and destroyed.
- The body conditions of the tribal people do not suit new areas and affected by many diseases.

9. List out the environmental damages caused because of mining. .(Nov/Dec 2013)

- Devegetation and defacing of landscape-It leads to ecological losses and landscape affected.
- Ground water contamination-Heavy metals leached into ground water.
- Surface water pollution-Drainage of acid mine contaminates the nearby streams and lakes.
- Air pollution-smelting and roasting process emits air pollutants.(lead,arsenic,SO_x)
- Subsidence of land-It results in cracks in houses, tilting of buildings, bending of rail tracks.

10. Write about the impacts of overgrazing on soil erosion. (Nov/Dec-2013)

- Due to overgrazing by livestock, the cover of vegetation gets removed from the soil.
- The roots of the grass are very good binders of soil. When the grasses are removed, the soil becomes loose and gets eroded by the action of wind and rainfall.

➤ Overgrazing is the major biotic agents which cause soil erosion.

➤ Because of these reasons, the top soil is disturbed and exposed directly to the action of various physical forces, which induces erosion.

11. Give short notes on the process of Eutrophication. (Nov/Dec-2012, Nov/Dec-2009)

A large proportion of N, P in fertilizers used in crop fields is washed by the runoff water in to nearby water source resulting in over nourishment of the lakes. This process is known as eutrophication.

Due to eutrophication lakes get attacked by algae blooms. These algae species use up the nutrients rapidly and grow very fast. Since the life time of the algae species are less quickly and pollute the water, which in turn the affect the aquatic life.

12. Write about the causes and problems of water logging. (Nov/Dec-2011)

Water logging is the land where water stand for most of the year.

Causes of water logging:

- Excessive water supply to the croplands.
- Heavy rain
- Poor drainage.

Problems of water logging:

During water – logged conditions, pore voids in the soil get filled with water and the soil – air gets depleted. The roots of the plants do not get adequate air for respiration. So, mechanical strength of the soil decreases and crop yield falls.

13. Mention the problems in salinity and give remedial measures. (Nov/Dec-2011)

Most of the water, used for irrigation comes only from canal or ground, which unlike rainwater contains dissolved salts. Under dry climates, the water gets evaporated leaving behind the salt in the upper position of the soil. Due to salinity, the soil becomes alkaline and crop yield decreases.

Remedy:

- The salt is removed by flushing them out by applying more good quality water to such soils.
- Drain the water using modern technologies.

14. What is renewable energy? Mention its merits. (Jun 2005)

Renewable energy resources are natural resources. The resources are capable of being regenerated by ecological processes within a reasonable time period.

Eg: Soil, water, air, wildlife, natural vegetation.

Merits of renewable energy:

- Unlimited supply
- Provides energy security
- Fits into sustainable developments concept
- Reliable and the devices are modular in size
- Decentralized energy production.

15. What is non-renewable energy resources and give examples? (Jun 2005)

- Non-renewable energy resources or conventional energy resources are natural resources, which cannot be regenerated once they are exhausted.
- They cannot be used again.
Eg: Coal, petroleum, natural gas and nuclear fuels.

The formation of coal from trees has taken million of years and cannot be regenerated in our life time.

16. Compare coal power with nuclear power.

Coal Power	Nuclear Power
Coal is called fossil fuel. It is formed from the remain of plants and animals for over millions of year.	Nuclear power is generated either from nuclear fission or fusion reaction.
Generation of coal power is governed by the temperature and pressure.	Generation of nuclear power is not governed by the temperature and pressure.
Coal power produces about 90% of world's total energy demands.	Nuclear power produces around 11% of world's energy needs.
Atomic number of elements, involved, does not change.	Atomic number of elements, involved, changes.

17. Write short notes on land degradation. (Dec 2008,Dec 2013)

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

Harmful effects of land degradation:

- The soil texture and soil structure are deteriorated
- Loss of soil fertility, due to loss of invaluable nutrients.
- Increase in water logging, salinity, alkalinity and acidity problems.
- Loss of economic social and biodiversity.

18. Define soil erosion. Mention its types. (Jun 2007)

Soil erosion is the process of removal of superficial layer of the soil from one place to another. It removes the soil components and surface litter.

Types of soil erosion:

- Normal erosion: It is caused by the gradual removal of top soil by the natural processes. The rate of erosion is slower.
- Accelerated erosion: It is mainly caused by man-made activities. The rate of erosion is much faster than the rate of formation of soil.

19. What is desertification? Mention its harmful effects. (Dec 2008, June 2013)

Desertification is a progressive destruction or degradation of arid or semiarid lands to desert. It is also a form of land degradation. Desertification is characterized by devegetation, depletion of ground water, salination and soil erosion.

Harmful Effects of desertification:

- Around 80% of land in the arid and semiarid regions is converted into desert.
- Around 600 million people are threatened by desertification.

20. Write about the conservation of energy and water resources. (Dec 2008)

Conservation of energy:

- Switch off lights and other appliances when not in use.
- Use solar heater for cooking food on sunny days, which will cut down LPG expenses.
- Dry the clothes in sunlight instead of driers.
- Use always Pressure cooker.

Conservation of water resources:

- Use minimum water for all domestic purposes.
- Check for water leaks in pipes and toilets and repair them properly.
- Reuse the soapy water after washing clothes for washing off the courtyards, driveways
- Use drip irrigation to improve irrigation efficiency and reduce evaporation.

PART-B

1. Write a brief note on Forest resources and its types. (Dec 2007) (8)
2. Explain the overexploitation of forest and ill-effects of deforestation.
(Jan 2006, Dec 2008, Dec 2009, June 2007, Dec 2006, Dec2013) (8)
3. Explain the hydrological cycle and discuss the type of water resources.(Dec 2013) (8)
4. Discuss the benefits and problems of constructing dams and also explain their effects on forests and tribal people. (Nov/Dec 2008, 2010, Nov/Dec 2013) (8)
5. Explain environmental major impacts of mineral extraction and list out the uses of minerals. (Jan 2012) (16)

6. Explain the adverse environmental effects of overgrazing and modern agriculture.
(Nov/Dec-2011, Nov/Dec-2008) (12)
7. Write an explanatory note on non-conventional energy sources. (AU-Dec 2008, Dec 2013) (16)
8. Explain in detail about ocean energy and biomass energy. (AU-Dec 2006) (16)
9. Explain how the non-renewable and alternate energy sources play an important role in environmental impact. (May/Jun 2011, Dec 2013) (10)
10. Explain the production and uses of bio gas.
11. Discuss about the land degradation and soil erosion. (Dec 2008, June 2013, Nov/Dec 2013) (12)
12. Write a detailed note on desertification. (4)
13. Explain about landslides. Discuss on equitable use of resources for sustainable life style. (Dec 2008) (8)
14. Discuss the role of an individual in conservation of natural resources. (8)
15. Explain in detail about biochemical degradation of pollutants. (8)
16. Discuss in detail about the following (8)
 - (i) Proteins.
 - (ii) Bioconversion of pollutants

UNIT – IV SOCIAL ISSUES AND THE ENVIRONMENT**PART – A****1. Define Sustainable development. (Dec 2009,10,12, May 12)**

Meeting the needs of the present without compromising the ability of future generations to meet their own needs. In short, it is a mode of development or way that aims not high standard of living, but to bring benefits to all not only for the present generation, but also for the future generation. It is essential to develop and modernize the technologies without losing our traditional values and practices.

2. What do you mean by a true sustainable development?

It aims at the optimum use of natural resources with a high degree of reusability, minimum wastage, last generation of toxic products and maximum productivity. Economy society and environment are the three components of sustainable development. They are closely interrelated one with the other. If one affected then, other will also be affected.

3. List out the various concepts or approaches for sustainable development.(Dec 2010)

- ❖ Developing appropriate technology locally adaptable and eco-friendly
- ❖ Reduce,reuse,recycle approach. It insists the optimum use of natural resources
- ❖ Providing environmental education& awareness to change the thinking and attitude of people towards our earth
- ❖ Consumption of renewable resources. Such that the consumption should not exceed regeneration capacity.
- ❖ Conservation of nonrenewable resources by recycling and reusing techniques
- ❖ Population control also ensures sustainable development

4. Define urbanization. (Dec 2010)

Urbanization is the movement of human population from rural areas to urban areas for the want of better education, communication, health, employment.

It is nothing but the slow process of conversion of a rural area into an urban area due to the rapid growth of technology and communications for the betterment of the society.

5. Write short note on energy demand. Illustrate with an example. (May13)

A demand for energy is called energy demand and it is due to the following

- ❖ Residential & commercial lightings.

- ❖ Transportation means, including motor cycle, car and public transport
- ❖ Industries are using a large proportion of energy.
- ❖ Modern life using a large number of electrical gadgets.
- ❖ To Control and prevent pollution need more energy dependent technologies.

6. Define rain water harvesting and mention some of its objectives.(Dec12)

It is a technique of capturing and storing of rain water for future utilization.

Need or objectives

- ❖ To meet the increasing demands of water.
- ❖ To raise the water table.
- ❖ To reduce the groundwater contamination.
- ❖ To reduce the surface runoff loss.
- ❖ To reduce storm water run-off, soil erosion.
- ❖ To minimize water crisis water conflicts.

7. What are the advantages of rainwater harvesting? (May 08)

- ❖ Reduction in the use of current for pumping water.
- ❖ Mitigating the effects droughts & achieving drought proofing.
- ❖ Increasing the availability of water from well.
- ❖ Rise in ground water level.
- ❖ Minimizing the soil erosion & flood hazards.
- ❖ Upgrading the social and environmental status.
- ❖ Future generation is assured of water

8. List out the need for watershed management. (May09)

- ❖ To minimize the risks of floods, droughts, landslides.
- ❖ To develop rural areas.
- ❖ To manage the watershed for developmental activities.
- ❖ To generate huge employment activities in the backward rain-fed areas.
- ❖ To protect the soil from erosion.
- ❖ To raise the groundwater level.
- ❖ To promote social forestry and horticultural activity.

9. List out the various watershed management techniques. (May09)

- ❖ Trenches- to improve groundwater storage.
- ❖ Earthen dam (or) stone embankment-to check the run-off water.
- ❖ Farm pond- to improve water storage capacity.
- ❖ Underground barriers- to raise the water table.

10. Define resettlement, rehabilitation and environmental refugees. (Dec09, 11)

Shifting of people from one location to another and settling them over there for a developmental purpose with a minimum loss is called resettlement. The people after shifting provided with job, home and other basic amenities is called rehabilitation. The people who were shifted from one place to another for this developmental purpose and found affected due to this displacement is called as environmental refugees.

11. Write short note on Tehri dam and Sardar Sarovar dam issues.(Dec11,12,13)

The sardar sarovar dam build in the Narmada river valley. About 573 villages consisting 10lakh people become homeless and 45,000 hectares of forests and 2,00,000 hectares of cultivated lands submerged in Maharashtra.

Tehri dam constructed across rivers Bhagirathi and Bhilanganga. It submerged nearly 100 villages, including Tehri a historical village 85,600 families were relocated. Till date the problem is not solved.

12. Define green chemistry.(May2009)

It is also called Sustainable chemistry, is a philosophy of chemistry research and engineering that encourages the design of products and process that minimize the use and generation of hazardous substances, Whereas environmental chemistry is the chemistry of the natural environment and of pollutant chemicals in nature. Green chemistry seeks to reduce the impact of chemicals on the environment by preventing pollutants at its source and using fewer natural resources.

13. List out various modes of nuclear accidents. (Dec2011)

- ❖ Nuclear bomb test – Bokran
- ❖ Nuclear power plant accidents
- ❖ Improper disposal of radioactive wastes
- ❖ An accident during transportation
- ❖ Core melt down – Chernobyl disaster

14. Define nuclear holocaust and write about nuclear winter.(Dec2011)

Nuclear energy when released into the environment it causes serious damage to the living biota and called as nuclear accidents or holocausts.

Nuclear winter: nuclear accident causes combustion of entire thing in that area creating a black soot carried to stratosphere, which absorbs the UV radiations and doesn't allow to pass into earth, thus a cooling effect produced decreasing evaporation of water and a process opposite to global warming occurs.

15. Write some control measures for nuclear holocausts. (May2012)

- ❖ Suitable precautions to be taken
- ❖ People must be trained to handle the materials
- ❖ Constant monitoring of radiation levels is essential
- ❖ Regular checks to be carried over by Atomic energy regulatory board

16. Define e – waste.(Dec 2011)

E-wastes are nothing but the electronic wastes like computers, television, mobile phones etc., They have more than 1000's of chemicals, including lead, cadmium, mercury, chromium all enters into our bio geochemical cycles which causes cancer respiratory problems etc., there by affecting mankind very badly.

17. List out the objectives of Wildlife protection act. (Dec2008, 12)

- ❖ Monitor wildlife populations regularly.
- ❖ To formulate management strategies to protect wildlife.
- ❖ Maintain essential ecological processes and life supporting systems
- ❖ Preserve biodiversity

- ❖ Ensure a continuous use of species

18. List out the objectives of Forest conservation act.(Dec 2012)

- ❖ To protect and conserve the forest
- ❖ To protect and conserve the animal resources of forest
- ❖ To protect and conserve the plant resource of forest
- ❖ To ensure judicious usage of forest.
- ❖ To protect and conserve the mineral resources of forest.

19. Write short note on important features of Amendment Act of 1988. (May 09)

- ❖ Forbidden to assign any forest land by way of lease.
- ❖ Forbidden to assign any forest land to any private person or non-govt body
- ❖ Forbidden to assign any forest land for reforestation.
- ❖ Clearance of forest land of naturally grown trees for the purpose of reforestation is forbidden.
- ❖ One who violates the law is punishable.

20. List out the various issues on enforcing forest conservation act.(Dec11)

- ❖ Transfers powers from state government to central government
- ❖ Local communities neglected from decision making
- ❖ Tribal people involved in criminal activities
- ❖ Less concentrated on poor people.

21. Define Eco labeling.

Eco label is an environmental claim that appears on the packaging of a product .It is awarded to a manufacturer by an appropriate authority. ISO 14020 is a guide to the award of Eco-labels. The government of India launched an Eco-mark Scheme in 1991 to increase consumer awareness in respect of environment friendly products. The aim of the scheme is to encourage the customers to purchase those products which have less harmful environmental impact.

22. Define landslides.(May 2008)

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

Causes- mainly caused by rain, top weight materials.

Movement of heavy vehicles.

Earthquakes, shocks, vibrations create landslides.

23. Define cyclone.(Dec 2013)

Intense depressions forming over the open oceans and moving towards the land.

The speed varies between 180-500 km/ hr

Tropical cyclones in the warm oceans are formed because of heat and moisture.

It moves like spinning top at the speed of 10-30 km/hr.

PART – B

1. Define sustainable development. Explain its concepts (Dec 2005, 06, June 2007) (8)
2. Write a note on wasteland reclamation. (Dec 2006, 08, 09) (8)
3. Write a note on watershed management.(Dec 2006, 08) (8)
4. What is meant by rain water harvesting? Why it is necessary now – a – days?
(Jan 2006, Dec 2008, 09) (8)
5. Write short note on national policy on resettlement and rehabilitation for affected families
(Dec 2009) (8)
6. Write briefly on any two nuclear disasters.(Dec 2006, May 2007) (8)
7. Give a brief explanatory note on 12 principles of Green Chemistry. (8)
8. Name the laws that have been framed for environmental protection and mention the objectives and features for each. Write about the enforcement machinery involved in environmental legislation.(Dec'05,Dec'06, May'07,Dec'07,May'08, Dec'08) (16)
9. Explain in detail about “The Biomedical Waste (Management and Handling) Rules 1998 and amendments. (16)
10. What is earthquake? Enumerate its effects. What measures should be taken to mitigate their disaster. (May 2008, Dec 2008) (16)
11. Define a cyclone. List out its effects, how to mitigate its effects? (Dec 2009) (8)
12. What are floods? How they formed, how to overcome their effects.(Dec 2009) (8)
13. Discuss the major impacts of landslides, how to mitigate them. (Dec 2010) (8)

UNIT-5-HUMAN POPULATION AND THE ENVIRONMENT

PART-A

1. Define population.

Population is defined as a group of individuals belonging to the same species, which live in a given area at a given time.

2. Write about the theories of population growth.

There are two theories to explain population growth. They are:

- Malthusian Theory- Malthusian Theory states that human population grows at an exponential-rate whereas, food production increases very slowly. During exponential growth, the population doubles in its size.

2 → 4 → 8 → 16 → 32 → 64

Population explosion is associated with poverty, starvation, disease, crime and misery.

- Marxian Theory- Marxian Theory was proposed by Karl Marx, it says that, population growth is a symptom of poverty, resource depletion, pollution and other social ills.

3. What is meant by population density and environmental resistance? Nov/Dec-2011

POPULATION DENSITY- It is expressed as the number of individuals of the population per unit area or per unit volume. This varies in response to changes in the environment and introduction with other living organism.

ENVIRONMENTAL RESISTANCE- Factors in an environment such as predators, competition, climate and food availability, that keep its various populations from reaching their maximum growth potential. (or) The limiting influences of environmental factors upon the increase in numbers of individuals in a community.

4. What are the parameters affecting population size. Nov/Dec-2010

Changes in population size are governed by 4 parameters. They are,

Birth rate or Natality- It is the number of live birth per 1,000 people in a population in a given year.

Death rate or Mortality- It is the number of live deaths per 1,000 people in a population in a given year.

Immigration- It denotes the arrival of individuals from neighboring population.

Emigration- It denotes the dispersal of individuals from the original population to new areas.

5. What is meant by doubling time in population growth? Nov/Dec-2011, May/June-2009

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

$$T_d (\text{Doubling Time}) = 70 / r$$

Where r = annual growth rate. If a nation has 2% annual growth its population will double in next 35 years. At the time of independence India's population were 45 crore. The population was 90 crore in year 2000. Therefore, one doubling time for India is about 50 years.

6. What is meant by population explosion? June-2013, Nov/Dec-2012, 2011,2010

The enormous increase in population, due to low death rate (mortality) and high birth rate (Natality), is termed as population explosion. The human population is not increasing at a uniform rate in all parts of the world. It results in higher population density and rapid deterioration of natural resources available in a country. During population explosion the population increases in an alarming rate, the population grows vigorously.

7. Define population equilibrium and population equation. Dec-2009

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

$$\text{POPULATION EQUATION- } P_{t+1} = P_t + (B-D) + (I-E)$$

Where P_t and P_{t+1} = sizes of population in an area at two different points in time t and $t+1$

B = Birth rate, D = Death rate, I = Immigration, E = Emigration

8. Mention the causes of population explosion. Nov/Dec-2009

- ❖ Invention of modern medical facilities reduces the death rate (mortality) and increases the birth rate (Natality), which leads to population explosion.
- ❖ Increase of life expectancy is another important reason for the population explosion. Example: In 1950, the average life expectancy of the human being was 40 years but now it is 61 years.
- ❖ Illiteracy is one of the reasons for the population explosion.
- ❖ Lengthening of age, suitable climate, and increase in fertility.

9. What is Human Development Index and population momentum? April/May-2011

Human Development Index is a comparative measure of life expectancy, literacy, education, and standards of living for countries worldwide. It is used to distinguish whether the country is a developed, a developing or an under-developed country.

POPULATION MOMENTUM- It refers to population growth at the national level, which would occur even if levels of child bearing immediately declined to replacement level (or) a continuation of population growth for several generations after the population has achieved the ability to replace itself.

10. What are the effects of population explosion? Nov/Dec-2009

- ❖ Renewable resources are under threat, environmental degradation.
- ❖ It increases disease, poverty, economic inequality, communal war.
- ❖ Overcrowding of cities leads to development of slums.
- ❖ Lack of basic amenities, scarcity of water, lack of sanitation.
- ❖ Unemployment and low living standard of people.

- ❖ Remedy-immediately reduce fertility rate through birth control programs.

11. What are the main objectives of the family welfare programme? Nov/Dec-2011, May/June-2009

- ❖ Reduce infant mortality rate to below 30 per 1000 infants.
- ❖ Achieve 100% registration of births, deaths, marriage and pregnancy.
- ❖ Encourage late marriages and later child-bearing.
- ❖ Making family planning available to all men & women, who wanted to choose the number of children and spacing of birth.
- ❖ Constrain the spread of AIDS/HIV.
- ❖ Promote vigorously the small family norms.
- ❖ Making school education up to age 14 free and compulsory.

12. What are the modern methods of family planning? Nov/Dec-2009

- ❖ Traditional method: It includes some traditions like, taboos, and folk medicine.
- ❖ Modern method- permanent method: It is done by a minor surgery.
 - Tubectomy- It is female sterilization done by tying the tubes that carry the ovum to the uterus.
 - Vasectomy- It is male sterilization done by tying the tubes that carry the sperm.

Both are very simple procedures, done under local anesthesia, which are painless and patients have no post-operative problems.

13. Write a note on NIMBY SYNDROME.

NIMBY means Not In My Back Yard.

It describes the opposition of residents to the nearby location of something they consider undesirable, even if it is clearly a benefit for many.

Examples- An incinerator, an ethanol plant, a nuclear power plant, a prison.

An Airport is a typical example of a NIMBY complex. It benefits a city economically, but no-one wants it near them because of the noise pollution and traffic it generates.

14. What is the Universal Declaration of Human Rights? Nov/Dec-2010

Universal Declaration of Human Rights (UNDHR) by the UNO was established in 1948. Some of them globally accepted are as follows:

- ❖ Human right to freedom
- ❖ Human right to property
- ❖ Human right to freedom of religion
- ❖ Human right to culture and education
- ❖ Human right to constitutional remedies
- ❖ Human right to equality
- ❖ Human right against exploitation
- ❖ Human right to food and environment
- ❖ Human right to good health

15. Write about the concept of value education. May/June-2014

The following is the concepts of values in environmental education.

- ❖ Why and how can we use less resources and energy?
- ❖ Why do we need to keep our surroundings clean?
- ❖ Why should we use less fertilizers and pesticides in farms?
- ❖ Why it is important for us to save water and keep our water sources clean?
- ❖ Separate our garbage into degradable and non-degradable types before disposal.

16. Write a short note on HIV/AIDS.

AIDS is Acquired Immuno Deficiency Syndrome. It is a viral disease, contagious disease, sexually transmitted disease. As it is received from an infected person, it is said to be acquired. AIDS is caused by the infection of an RNA virus on lymphocytes. As a result the activity of T-helper cells depressed. This leads to the suppression of the immune system. Hence the name Immuno Deficiency. AIDS was first discovered in America in 1981. Now this disease is found in all countries.

17. Write about the preventive measures of HIV/AIDS. Nov/Dec-2009

- ❖ Education- health education enables people to avoid indiscriminate sex and encourages the use of condoms.
- ❖ Prevention of blood borne HIV transmission- Blood should be screened for HIV before transmission and strict sterilization practices should be followed.
- ❖ Primary health care- AIDS awareness programme should be encouraged. Voluntary health agencies should participate in large.
- ❖ Counselling services- it should be provided either in person or through telephone.
- ❖ Drug treatment- Testing HIV positive does not mean the end. Seeking early medical care and staying active are very vital in managing HIV.

18. Give reasons for child labours. May/June-2014

- ❖ Poverty- Poverty is the main reason to force these children to work in unhealthy conditions.
- ❖ Want of money- Parents require money for their family, so they are in a position to send their children to work.

19. What do you mean by EIA? Nov/Dec-2006

EIA is defined as a formal process of predicting the environmental consequences of any development projects.

- ❖ It is used to identify the environmental, social and economic impacts of the project prior to decision making.
- ❖ It foresees the problems at an early stage.
- ❖ The development of any project such as, industries, the construction of dams, laying of roads, construction of bridges etc. needs EIA.
- ❖ The EIA is conducted by Environmental consultants.
- ❖ The EIA is recorded as an environmental statement or report.

20. What are the objectives of EIA? May/June-2014

The EIA is carried out in two stages. Namely

- ❖ Preliminary Assessment- It is carried out during planning.
- ❖ Detailed assessment- It is carried on completion of the project.

OBJECTIVES OF EIA:

- ❖ To identify the main issues and problem of the parties.
- ❖ To identify who is the party.
- ❖ To identify what are the problems of the parties.
- ❖ To identify why the problems are arise.

PART-B

1. Explain the impacts of population growth on environmental issues.
(8) May-2007, Nov/Dec-2008, Dec-2009
2. Discuss the population growth variation among nation.
(8) May/June-2011, Nov/Dec-2011, Nov/Dec-2010
3. Define population explosion. Explain the environmental and social impacts of growing population. (12) June-2013, Nov/Dec-2011
4. List the reasons for high population growth in India. (4) Nov/Dec-2010
5. Discuss the development and implementation of the family welfare programme in India. (16) May/June-2014, May/June-2011, Nov/Dec-2010, Nov/Dec-2009
6. Discuss the influence of environmental parameters on human health. (16)
7. What are human rights? Discuss the salient features of the universal declaration of human rights by UNO. (8) May/June-2011, Nov/Dec-2011
8. Explain the objectives and elements of value education. (16) Nov/Dec-2011, Nov/Dec-2010 Nov/Dec-2009
9. What is AIDS? Discuss briefly on the transmission of HIV and how it can be prevented?
(16) May/June-2014, May/ June-2013, Nov/Dec-2012, Nov/Dec-2010, Nov/Dec-2009
10. Give a brief account on various issues and measures of women and child welfare in India. (16) May/June-2014, May/June-2011, Nov/Dec-2011, Nov/Dec-2010, May/June-2009
10. Explain the role of information technology in environment management with the help of case studies. (16) June-2013, Nov/Dec-2012, Nov/Dec-2011, Nov/Dec-2010, May/June-2009
11. Explain the role of information technology in human health with the help of case studies.
(8) June-2013, Nov/Dec-2012, Nov/Dec-2011, Nov/Dec-2010, May/June-2009
12. Explain the scope, benefits and key elements of EIA. (8) Nov/Dec-2006.

