

**GE6351- ENVIRONMENTAL SCIENCE AND ENGINEERING****UNIT I****ENVIRONMENT, ECOSYSTEMS AND BIODIVERSITY**

Definition, scope and importance of Risk and hazards; Chemical hazards, Physical hazards, Biological hazards in the environment – concept of an ecosystem – structure and function of an ecosystem – producers, consumers and decomposers-Oxygen cycle and Nitrogen cycle – energy flow in the ecosystem – ecological succession processes – Introduction, types, characteristic features, structure and function of the (a) forest ecosystem (b) grassland ecosystem (c) desert ecosystem (d) aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries) – Introduction to biodiversity definition: genetic, species and ecosystem diversity – bio geographical classification of India – value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values – Biodiversity at global, national and local levels – India as a mega-diversity nation – hot-spots of biodiversity – threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts – endangered and endemic species of India – conservation of biodiversity: In-situ and ex-situ conservation of biodiversity. Field study of common plants, insects, birds Field study of simple ecosystems – pond, river, hill slopes, etc.

**A. ENVIRONMENT****1. What is environment? [Chen AU Apr 2011]**

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

**2. Define environmental science. [Chen AU Jan 2006]**

Environmental science is the study of the environment, its biotic (biological) and abiotic (non-biological) components and their interrelationship.

**3. What are the important components of environment?**

- a. Abiotic or Non-living component
- b. Biotic or Living component
- c. Energy component

**4. What are the functions of lithosphere?**

- a. It is home for human beings and wildlife

- b. It is storehouse of minerals and organic matters

**5. Explain biosphere.**

**[Chen AU Dec 2005]**

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

**6. State the significance and scope of environmental education.**

**[Chen A.U. D 2009, Dec 2008]**

**Significance**

1. Environmental studies inform the people about their effective role in protecting the environment by demanding changes in laws and enforcement system.
2. Environmental studies have a direct relation to the quality of life we live.
3. Environmental studies develop a concern and respect for the environment.

**7. What is environmental resistance?**

**[Chen A.U. Apr 2011]**

Factors in an environment such as predators, competition, climate and food availability, that keep its various population from reaching their maximum growth potential is known as environmental resistance.

**Scope**

1. To get an awareness and sensitivity to the total environment and its related problems.
2. To motivate the active participation in environmental protection and improvement.

**7. State the need for public awareness for solving environmental problems.**

Environmental pollution cannot be removed by the laws alone. The proper implementation and especially public participation are the important aspects, which should be given importance and stress. The public participation is useful in law making process and controlling the pollution activities. Thus the public participation plays a major role in the effective environmental management.

**8. Environmental awareness is need of the hour comment. [TCY A.U. Dec 2009]**

The air we breathe, the water we drink, the food we consume and the land we live on are all contaminated by the industrial activities. There is no zero pollution industry. Because of the lack of self discipline and not worrying about our future generation, the valuable resources are polluted.

To solve the above problems, need of environmental awareness is very important.

**9. Mention the various types of public participation.**

Pressure group, Watch dog, Advisory council, and enforcing the environmental laws.

**B. ECOSYSTEM****1. What is ecology?**

Ecology is the study of interaction among organisms or group of organisms with their environment. The environment consists of both biotic and non-biotic components.

**2. Explain the concept of an ecosystem. [Chen AU Jun 2007, Apr 2011, Dec 2013]**

A group of organism interacting among them and with the environment is known as the concept of ecosystem. An ecosystem may be natural like a pond, a lake, a river, an ocean, or a forest or it may be man made like an aquarium.

**3. What are the components of ecosystem?**

- a.. Abiotic or Non-living component
- b. Biotic or Living component

**4. How are biotic components grouped?**

The members of biotic components of an ecosystem are grouped into three groups based on how they get their food.

- a. Producers
- b. Consumer
- c. Decomposers

**5. What are autotrophic and heterotrophic components of an ecosystem? Give examples**

**[Coim. A.U. Dec 2009]**

**1. Autotrophic components**

The members of autotrophic components are producers, which are autotrophs (self-nourishing organisms). They derive energy from sunlight and make organic compounds from inorganic substances.

Examples: Green plants, algae, bacteria, etc.,

**2. Heterotrophic components**

The members of heterotrophic components are consumers and decomposers, which are heterotrophs (dependent on others for food). They consume the autotrophs (Producers)

The heterotrophs are

- (a) Macro consumers: They are herbivores, carnivores (or) omnivores.
- (b) Saprotrophs: They are decomposers (bacteria, fungi, etc.)

**6. Define the terms producers and consumers.**

**[A.U. May 2008, Dec 2011]**

- (i) Producers synthesize their food themselves through photosynthesis.
- (ii) Consumers are organisms which cannot prepare their own food and depends directly or indirectly on the producers.

**7. Define primary production and secondary production.**

**[Chen A.U. Dec 2008]**

Primary production of an ecosystem is defined as the conversion of radiant energy into organic substances by photosynthesis by the primary producers (Plants)

Secondary production of an ecosystem is defined as distribution of energy in the form of food to the consumer (or) the energy stored by the consumer.

**8. How does a biome differs from an ecosystem.**

**[A.U. Dec 2007]**

The kind of organisms which can live in a particular ecosystem depends on their 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 nutrient cycles?**

The cyclic flow of nutrients between the biotic and abiotic components is known as nutrient cycle or biochemical cycles.

**10. What is hydrological cycle?**

Movement of water in a cyclic manner is known as hydrological cycle

**11. What is ecological succession?**

**[TCY AU Dec 2008, Chen AU Jun 2005]**

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

**12. What is food chain?**

**[Chen AU Jun 2006, Dec 2009, 2015]**

The sequence of eating and being eaten in an ecosystem is known as food chain.

**13. What are trophic levels (or) feeding levels?**

The various steps through which food energy passes in an ecosystem is called as trophic levels.

**14. What is food web?****[Coim A.U. Dec 2009][Chen AU Jun 2006]**

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

**15. What is Ecological pyramids?**

Graphical representation of structures and function of trophic levels of an ecosystem, starting with producers at the bottom and each successive trophic level forming the apex is known as an ecological pyramid.

**16. Name any four ecosystems.****[Chen AU Jan 2006]**

- a. Forest ecosystems
- b. Grassland ecosystems
- c. Desert ecosystems
- d. Aquatic ecosystems

**17. What are the characteristics of desert ecosystem?****[Chen A.U. Dec 2008]**

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

**18. What is meant by keystone species?****[Chen A.U. Dec 2008]**

Within a habitat each species connects to and depends on other species. But, while each species contributes 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 disappears from its habitat, that habitat changes drastically.

**19. What are the types of grassland ecosystem?****[Chen A.U. Dec 2010]**

There are three types of grassland ecosystem based on the climate condition.

1. Tropical grassland
2. Temperate grassland
3. polar grassland

**20. What are food chains? Mention their type.****[Chen A.U. Dec 2010]**

The sequence of eating and being eaten in an ecosystem is known as food chain.

1. Grazing food chain
2. Detritus food chain

**21. What are the abiotic components of an ecosystem? [Chen A.U. Dec 2010, Dec 2014, 2015]**

The nonliving components (physical and chemical) of an ecosystem collectively form a community called abiotic community.

**22. Differentiate food chain and food web.****[Chen A.U. Apr 2011, Dec 2013]**

Food chain	Food web
1. The sequence of eating and being eaten in an ecosystem is known as food chain	The interlocking pattern of various food chains in an ecosystem is known as food web.
2. If one species gets affected or become extinct, then the species in the subsequent trophic level are also affected.	If one of the species gets affected, it does not affect other trophic levels so seriously. There are number of options available at each trophic level.

**BIODIVERSITY****1. Define Biodiversity (or) What is biodiversity and its significance.****[Chen AU Dec 2005, Jun 2006, Apr 2011, Apr 2015]**

Biodiversity is defined as the variety and variability among all groups of living



organisms and the ecosystem in which they occur.

**Significance:**

- a. Biodiversity is very important for human life, as we depend on plants, micro-organisms, earth's animals for our food, medicine and industrial products.
- b. Biodiversity is also important for forestry, fisheries and agriculture, which depend on rich variety of various biological resources available in nature.
- c. Biodiversity protects the fresh air, clean water and productive land.
- d. Loss of biodiversity has serious economic and social costs for any country.

**2. Explain the classification of biodiversity.**

Biodiversity is generally classified into three types

Genetic diversity, Species diversity and Ecosystem diversity

**3. Define genetic diversity and species diversity.**

[TNV AU Dec 2008, Chen AU Dec 2007, May 2008, Dec2010, 2011]

Genetic diversity is the diversity within species ie., variation of genes within the species and the diversity between different species. The sum of varieties of all the living organisms at the species level is known as species diversity.

**4. What is point richness?**

It refers to the number of species that can be found at single point in a given space.

**5. What are biodiversity hot-spots?**

[Chen AU Apr 2011]

The hotspots are the geographic areas which possess the high endemic species.



**6. What are the two important biodiversity hot spots in India?**

1. Eastern Himalayas
2. Western Ghats

**7. What are the criteria for recognizing hot spots?****[Chen AU Dec 2011]**

- (1) The Richness of the endemic species is the primary criterion for recognizing hot spots
- (2) The hot spots should have a significant percentage of specialized species.
- (3) The site is under threat.
- (4) It should contain important gene pools of plants of potentially useful plants.
- (5)

**8. India is a mega diversity nation – Account.****[Chen A.U. Dec 2008, Dec 2009]**

India is one among the 12 mega diversity countries in the world. It has 89,450 animals species accounting for 7.31% of the global faunal species and 47,000 plant species which accounts for 10.8% of the world floral species. The loss of biodiversity or endemism is about 33%.

**9. What is the need of biodiversity conservation?**

- a. It provides immediate benefits to the society such as recreation and tourism.
- b. Drugs, herbs, food and other important raw materials can be derived from plants and animals.
- c. It also preserves the genetic diversity of plants and animals.
- d. Ensures the sustainable utilization life supporting systems on earth.

**10. Give few examples for endangered and endemic species of India. [Chen A.U. Dec 2008]****Endangered species**

1. Reptiles : Tortoise, python
2. Mammals : Indian wolf, Red fox, Tiger

3. Primates : Hoolock gibbon, Golden monkey

4. Plants : Rauvol serpentina, Santalum

### **Endemic Species**

1. Flora: Sapria Himalayan, Ovaria lurida

2. Fauna: Monitor lizards, Indian salamander.

### **11.Explain threatened and endangered species. [Chen A.U. Dec 2006, Apr 2011, Dec 2014]**

A species is said to endangered, when its number has been reduced to a critical level.

Unless it is protected and conserved, it is in immediate danger of extinction.

### **12 .What do you understand by the term flora and fauna? [Chen A.U. Dec 2008]**

**Flora:** Plants present in a particular region or period.

**Fauna:** Animals present in a particular region or period.

### **13. Explain vulnerable species.**

A species is said to be vulnerable when its population is facing continuous decline due to habitat destruction or over exploitation. Such a species is still abundant.

### **14. What is in-situ conservation?**

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

### **15. What is ex-situ conservation?**

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

### **16. What are the advantages and disadvantages of ex-situ conservation?**

#### **Advantages:**

a. Survival of endangered species is increasing due to special care and attention.

- b. In captive breeding, animals are assured food, water, shelter and also security and hence longer life span.
- c. It is carried out in cases of endangered species, which do not have any chances of survival, in the wild.

**Disadvantages:**

- a. It is expensive method
- b. The freedom of wildlife is lost
- c. The animals cannot survive in natural environment.

**17. Enumerate the human activities which destroy the biodiversity. [Chen AU Jan 2006]**

- a. The farmers prefer hybrid seeds, as a result many plant species become extinct.
- b. For the production of drugs the pharmaceutical companies collect wild plants, so several medicinal plants now become extinct.
- c. Tropical forest is the main sources of world's medicine. Every year these forests are disappearing due to agriculture, mining and logging.

**PART – B**

1. Explain food chain and food web.
2. Write a note on carbon cycle. (A.U. Dec 2005)
3. Describe the types, characteristic features, structure and functions of,
  - (i) Forest ecosystem, ii) Aquatic ecosystem. (A.U. Jan 05, Apr 10, Dec 2013, Apr 2015)
4. Explain ecosystem. (A.U. Dec 2005)
5. Discuss the components of ecosystem. (A.U. Dec 2005 May 11)
6. Briefly explain the energy flow through ecosystem. (A.U. Dec 2005, Dec 09, 11)
7. Explain ecosystem, energy flow in ecosystem, food chain, food webs and ecological Pyramids. (A.U. Dec 2005, Dec 2010)

8. What is an ecosystem? Describe the structure and functions of various components of an ecosystem. (A.U. Jan 2006, Dec 09, Dec 2010,2013)
9. Briefly discuss the structural and functional components of an ecosystem. (A.U. May 2006)
10. Explain the following: (A.U. May 2006)
- (i) Forest ecosystem
  - (ii) Ecological succession.
11. Write short notes on the following:
- (i) Energy flow in eco-system
  - (ii) Pond eco-system
  - (iii) Threats to bio-diversity. (A.U. Dec 2010)
12. State the four components of ecosystem. (A.U. Dec 2006)
13. Describe the Biotic component of an ecosystem. (A.U. Dec 2009)
14. Write briefly on types of food chain. (A.U. Dec 2006)
15. Explain ecological pyramids. (A.U. Dec 2006, May 11)
16. Discuss the major features of grassland ecosystem. (A.U. Dec 2009 Dec 2014)
17. Write a note on food chain. (A.U. May 2007)
18. With neat sketch explain the flow of energy through the various components of the Ecosystem. (Producers, consumers and decomposers) (A.U. Dec 2007)
19. Explain how fat-soluble pollutants like DDT get biomagnified. (A.U. Dec 2007)
20. Discuss the concept of ecological pyramid. (A.U. Dec 07, June 07)
21. Define the ecosystem. Give an account of the structure and function of an ecosystem. (A.U. May 2008)
22. Explain the flow of energy through the atmosphere and its utilities in an ecosystem. (A.U. May 2008)
23. Define and explain the term Ecosystems, its types, characteristics, structure and function. (A.U. Apr 2010)
24. Write down the ecological succession and ecological pyramid (A.U. Dec 2010, Apr 2015)

25. Explain the components, structure and functions of a desert ecosystem. (A.U. Dec 2010)

26. explain the structure and function of the following. (A.U. May2011)

- (i) forest ecosystem
- (ii) Grassland ecosystem
- (iii) Desert ecosystem
- (iv) Aquatic ecosystem

27. Write notes on (A.U. May2011)

- (i) Ecological pyramids
- (ii) Values of biodiversity

28. With a neat sketch discuss the Nitrogen cycle. (A.U Dec 2014)

### **PART – B**

1.Explain the various threats and the measures recommended for conservation of biodiversity. (A.U. Jun 2005,Dec 2013)

2. Discuss the threat faced by Indian Biodiversity. (A.U. Jan 2006)

3. Explain the strategy adopted to conserve biodiversity. (A.U. Jan 2006)

4. Briefly explain or give an account of conservation of bio-diversity. (A.U. May 06, Apr 10)

5. Discuss the importance of Biodiversity. (A.U. Dec 2009,2013)

6. Discuss the four types of diversity. (A.U. Dec 2006)

7. Write a note on measuring Biodiversity. (A.U. Dec 2006)

8. Why Biodiversity is rich in the tropics? (A.U. Dec 2006)

9. What are the causes for loss of Biodiversity? (A.U. Dec 2006)

10. Explain the role of biodiversity at global, national and local levels.

(A.U. May 07, Apr 10, May 11)

11. Describe the term hot spots in biodiversity. (A.U. Dec 2007)

12. What do you understand by hot spots of biodiversity? Name and briefly describe two hot

Spots of biodiversity that extend in India. (A.U. May 2008)

13. Explain in-situ and ex-situ conservation along with their merits and limitations.

(A.U. May 2008, Dec 2010, May 11, Dec 11)

14. Write informative notes on 'Insitu' conservation. (A.U. Dec 2009)
15. Write a note on endangered and endemic species of India. (A.U. Dec 2009)
16. Write a note on conservation of Biodiversity. (A.U. Dec 2009)
17. Classify and explain the values of biodiversity. (A.U. Dec 2010, May 11)
18. What are the major causes of Man- wild life conflict? Discuss the remedial steps that can curb the conflict. (A.U. Dec 2011, Apr 2015)
19. What do you mean by conservation of biodiversity? State and explain the basic approaches to wildlife conservation. (A.U. Dec 2014)

## UNIT II

### ENVIRONMENTAL POLLUTION

Definition – causes, effects and control measures of: (a) Air pollution (Atmospheric chemistry- Chemical composition of the atmosphere; Chemical and photochemical reactions in the atmosphere -formation of smog, PAN, acid rain, oxygen and ozone chemistry;- Mitigation procedures- Control of particulate and gaseous emission, Control of SO<sub>2</sub>, NO<sub>x</sub>, CO and HC) (b) Water pollution : Physical and chemical properties of terrestrial and marine water and their environmental significance; Water quality parameters – physical, chemical and biological; absorption of heavy metals - Water treatment processes. (c) Soil pollution - soil waste management: causes, effects and control measures of municipal solid wastes – (d) Marine pollution (e) Noise pollution (f) Thermal pollution (g) Nuclear hazards–role of an individual in prevention of pollution – pollution case studies – Field study of local polluted site – Urban / Rural / Industrial / Agricultural.

#### **1. Define pollution.**

Pollution is generally defined as the addition of the constituents to water, air or land which adversely alter the natural quality of environment.



**2.Name any four air pollutants and their sources and effects. [Chen AU Jun 2005]**

S.No.	Name of the Pollutant	Sources	Effects
1	Carbon monoxide	Cigarette smoking, incomplete burning of fossil fuels	Coma, brain cell damage
2	Nitrogen dioxide	burning of fossil fuels	Acid rain, lung damage
3	Sulphur	Coal burning	Breathing problem, acid rain
4	Lead	Paint, smelter, leaded petrol	Mental retardations, harm to wild life

**3. Give examples for primary and secondary air pollutants.****[Chen AU Dec 2007]****Differentiate between primary and secondary air pollutions with examples****[TNV A.U. Dec.2009]**

Primary pollutants are those emitted directly in the atmosphere in harmful form.

**Example:** CO, NO, SO<sub>2</sub> etc

Some of the primary pollutants may react with one another or with the basic components of air to form new pollutants. They are called as secondary pollutants.

**4. Classify air pollutants with suitable examples.****[TCY A.U. Dec 2008]**

1. Primary pollutants: (CO, NO, SO<sub>2</sub>)
2. Secondary pollutants: (HNO<sub>3</sub>, H<sub>2</sub>SO<sub>4</sub>)

**5. What are the causes of air pollution?****[Coim A.U. Dec 2009, Apr 2011]**

- (i) Incomplete burning of fossil fuels, liberate CO, NO<sub>2</sub>, etc.
- (ii) Coal burning in power plants, liberate SO<sub>2</sub>
- (iii) Paint, smelters, lead manufacture, liberate Pb.
- (iv) Agriculture, decay of plants, liberate hydrocarbons.



**6. Define photochemical smog.****[Chen AU Dec 2006]**

The brownish smoke like appearance that frequently forms on clear, sunny days over large Cities with significant amounts of automobile traffic. It is mainly due to chemical reactions among nitrogen oxides and hydrocarbon by sunlight.

**7. What are point and non-point sources of water pollution?**

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

**Non-point sources:** They cannot be traced at any single site of discharge. They are usually large land areas or air sheds that pollute water by runoff, subsurface flow or deposition from the atmosphere.

**8. Write any four major water pollutants.****[Chen AU Jun 2006]**

- a. Pesticides and biocides
- b. Heavy metals, mercury, crude oil, plastics
- c. Industrial and agricultural wastes
- d. Thermal pollution

**9. What is meant by BOD and COD?****[TCY A.U. Dec 2008, Chen AU Apr 2011]**

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

COD is the amount of oxygen required for chemical oxidation of organic matter using some oxidizing agent like  $K_2Cr_2O_7$  and  $KMnO_4$

**10. Define soil pollution.****[Chen AU May 2008]**

The contamination of soil by human and natural activities which may cause harmful effects on living beings.

**11. Write any two causes of soil pollution.**

**[Chen AU Jan 2006]**

Industrial wastes, urban wastes, agricultural practices, radioactive pollutants, Biological agents.

**12. What is marine pollution?**

**[TNV A.U. Dec 2008]**

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.

**13. Name the sources and effects of marine pollution.**

**[Chen AU Jun 2005, Dec 2014]**

S.No.	Sources	Effects
1	Dumping the wastes	Marine birds ingest plastic which causes gastro-intestinal disorders
2	Oil	Damage to marine fauna and flora, retard the rate of O <sub>2</sub> uptake by water

**14. Define noise pollution.**

**[Chen AU Dec 2013, Apr 2015]**

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

**15. When a sound causes noise pollution?**

**[Chen AU Jan 2006]**

Noise beyond 120 dB causes noise pollution

**16. When does a sound causes noise pollution?**

**[A.U. Jan 2006]**

The sound intensity is measured in decibel (dB), which is tenth part of the longest unit Bel. One dB is equal to the faintest sound, a human ear can hear. If the intensity of the sound exceeds 1 dB, noise pollution occurs.

**17. Give any four methods to control noise pollution.**

**[Chen AU Jun 2007]**

**a. Source Control**

This may include source modification such as acoustic treatment to machine surface, design changes, limiting the operational timings and so on.

**b. Transmission Path Intervention**

This may include containing the source inside a sound insulating enclosure, construction of a noise barrier or provision of sound absorbing materials along the path.

**c. Receptor control**

This includes protection of the receiver by altering the work schedule or provision of personal protection devices such as ear plugs for operating noisy machinery. The measure may include dissipation and deflection methods.

**d. Oiling**

Proper oiling will reduce the noise from the machines.

**18. Define thermal pollution.**

**[Chen AU Dec 2005, 2008]**

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.

**19. Name some important natural sources for nuclear hazards.**

- (a) The important natural source is space, which emit cosmic rays.
- (b) Soil, rocks, air, water, food, radioactive radon-222 etc., also contain one or more radioactive substances.

**20. Define hazardous wastes.**

**[Chen AU Dec 2006]**

Wastes like toxic chemicals, radioactive or biological substances which contribute to an increase in mortality or in serious irreversible illness to human health and environment are called hazardous wastes.

**21. Why nuclear hazards are so dangerous?**

**[TCY A.U. Dec 2008]**

Radioactive radiation, liberated by nuclear hazards, affects the cells in the body and the

function of glands and organs. People suffer from blood cancer and bone cancer if exposed to doses around 100 to 1000 roentgens. Unlike the other pollution, radioactive pollution can cause genetic disorders even in the subsequent generations.

**22. How nuclear hazards can be disposed safely? [A.U June 2007]**

Nuclear hazards are disposed safely by dumping them in a big concrete tank and throwing it in deep sea.

**23. Mention some important control measures of nuclear hazards.**

- a. Nuclear devices should never be exploded in air. If these activities are extremely necessary then they should be exploded underground.
- b. In nuclear reactors. Closed-cycle coolant system with gaseous coolants may be used to prevent extraneous activation products.
- c. Containments may also be employed to decrease the radioactive emissions. It can be achieved by using tightly sealed boxes and closed cycle system.
- d. Production of radioisotopes should be minimized, as once produced they cannot be rendered harmless by any means except the passage of time.
- e. Minimum number of nuclear installations should be commissioned.

**24. What are the various sources of radioactive pollution? [Chen A.U. Dec 2008 A.U.Apr.2015]**

**1. Natural sources.**

- (a) The very important natural source is space, which emit cosmic rays.
- (b) Soil, rocks, air, water, food, radioactive radon-222 etc. also contain one or more radioactive substances.

**2. Man-made sources**

Man-made sources are nuclear power plants, X-rays, nuclear accidents, nuclear bombs, diagnostic kits, etc., where radioactive substances are used.

**25. Define solid waste [TCY A.U. Dec 2009 A.U.Apr.2015]**

Any garbage, refuse sludge from waste treatment plant, and other discarder material including solid, liquid, semi-solid from commercial, mining and agricultural operations are called as solid wastes.

**26. What are the types of solid wastes? [Chen AU Dec 2006, Jun 2007]**

- a. Municipal wastes

- b. Industrial wastes
- c. Hazardous wastes

**27. Mention the sources of solid wastes.****[Chen A.U. Dec 2009]**

1. Domestic wastes – cloth, waste papers
2. Commercial wastes – cans, bottle, polythene bags
3. Construction wastes – Wood, Concrete
4. Biomedical wastes – Infectious wastes
5. Industrial wastes – Nuclear and thermal power plants
6. Hazardous wastes – Toxic wastes, chronic toxicity

**28. Differentiate between recycling and reuse [Chen AU Dec 2007, Apr 2011]****Reuse**

- a. The refillable containers, which discarded after use can be reused
- b. Rubber rings can be made from the discarded cycle tubes, which reduces the waste generation during manufacturing of rubber bands.

**Recycling**

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

**Example**

- a. Old aluminum cans and glass bottles are melted and recast into new cans and bottles
- b. Preparation of cellulose insulation from paper.

**29. What are the roles of women in environmental pollution? [Chen AU Dec 2008]**

- a. In rural areas women plant trees and grass, grow vegetables with the drip-irrigation method on order to save water.
- b. In urban areas they go shopping using cloth bags to reduce white pollution.

**30. State the role and responsibility of an individual in the prevention of pollution.**

- a. Plant more trees
- b. Help more in pollution prevention than pollution control
- c. Use water, energy and other resources efficiently
- d. Purchase, recyclable and recycled and environmentally safe products

- e. Use CFC free refrigerators
- f. Use natural gas than coal
- g. Reduce deforestation.

**31. What do you understand by soil pollution?****[Chen A.U. Dec 2010]**

The pollution affects and alter the chemical and biological properties of soil.

As a result, hazardous chemical can enter into human food chain from the soil or water disturbs the biochemical process and finally lead to serious effects on living organism.

**32. What are causes of noise pollution?****[Chen A.U. Dec 2010]**

1. By machine like mechanical saws and pneumatic drill.
2. from transport, rail, air craft, road vehicles like , scooters, cars, motorcycles,buses.
3. common noise makers are musical instruments, TV, VCR, radios, transistors, Telephone and loudspeakers.

**33. What are the effects of thermal pollution?****[Chen A.U. Apr 2011]**

1. Reduction in dissolved oxygen.
2. Increase in toxicity.
3. Interference with biological activity.
4. Interference with reproduction.
5. Direct mortality.
6. food storage for fish.

**34. What are oxygen demanding wastes?****[Chen AU Apr 2011]**

Oxygen demanding wastes is the one to reduce amount of oxygen water in water is known as oxygen demanding wastes.The oxygen demanding wastes are BOD and COD

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

COD is the amount of oxygen required for chemical oxidation of organic matter using

some oxidizing agent like  $K_2Cr_2O_7$  and  $KMnO_4$

**35. What is cyclone?****[Chen AU Dec 2013]**

Cyclone is a meteorological phenomena, intense depressions forming over the open oceans and moving towards the land. On reaching the shores, it moves into the interior of the land or along the shore lines.

**36. Mention the effects of ozone on plants.****[Chen AU Dec 2014]**

1. Ozone damages vegetation and ecosystems by inhibiting the ability of plants to open the microscopic pores on their leaves to breathe.
2. It interferes the photosynthesis process by reducing the amount of carbon dioxide the plants can process and release as oxygen.

**37. What is acid rain (or) What is acid precipitation. [Chen AU Jan 2006, Dec 2009, Apr 2015]**

The presence of excessive acids in rain water is known as acid rain.

**38. What is acid precipitation?****[Chen AU Dec 2005, Dec 2006]**

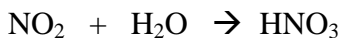
It includes acid rain, acid fog, acid snow and other form of precipitation that is more acidic than normal.

The presence of  $SO_2$  and  $NO_2$  gases in the atmosphere, decreases the pH of the water during the rainfall. This type of precipitation of water is called acid deposition.

**39. Mention the causes and effects of acid rain.****[Chen A.U. Dec 2008]**

The gases nitrous oxide, sulphur dioxide due to burning of coal and oil, in the atmosphere react with water to form acids.



**Effects**

- Acid rain corrodes houses, monuments, statues, bridges and fences.
- Acid rain and dry deposition of acidic particles contribute to the corrosion of metals, and the deterioration of paint and stone.
- Dry deposition of acidic compounds can also dirty buildings and other structures, leading to increased maintenance costs.

**40. How does ozone layer depletion take place? Write its consequences.**

[TCY A.U Dec 2008]

Depletion of ozone occurs due to the presence of  $\text{CO}_2$ , CFC in the atmosphere.

**Consequences**

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

**41. What are the causes and effects of ozone layer depletion?**

[Chen AU Jun 2005][Chen AU Dec 2009]

**Causes**

Presence of

- (i) Chloro Fluoro Carbon.
- (ii) Hydro Chloro Fluoro Carbon (HCFC)
- (iii) Bromo Fluoro Carbons (BFC)

**Effect**

- (i) UV rays destroy the melamine pigment in human skin.
- (ii) It also affects the aquatic forms.
- (iii) It degrades paints, plastics and other polymeric materials.
- (iv) Increases the average temperature of the earth.

**42. “Ozone is a life savior, if present in stratosphere, but is a pollutant, if present in troposphere” Justify the statement.** [TCY A.U. Dec 2009]

In stratosphere, ozone filters out the UV- radiation and protects us from the

Damaging UV radiation of the sun.

But, in troposphere, it is highly reactive irritating gas with an unpleasant odor. It also

Oxidizes atmospheric S, N and C as SO<sub>2</sub>, SO<sub>3</sub>, NO, NO<sub>2</sub>, CO, CO<sub>2</sub> and cause pollution. It is also a major component of photochemical smog.

**43. How CFC's are accumulated in atmosphere.** [Chen AU Jun 2006]

CFC's are accumulated in atmosphere through

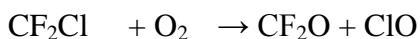
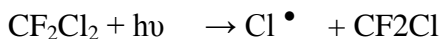
- (i) Aerosol propellants.
- (ii) Cleaning solvents.
- (iii) Refrigerants (Freon).
- (iv) Foam plastic blowing agent.

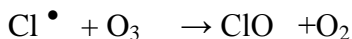
**44. Write note of CFC.**

CFC (Chlorofluoro carbon) is a green house gas (or) ozone depleting substance.

It was found that the ozone layer was attacked by chlorofluorocarbons (CFCs) which are released into atmosphere by refrigeration units, air conditioning systems, aerosol sprays and cleaning solvents. Chlorofluoro carbons release chlorine which breaks ozone into oxygen.

The following reactions will then occur





Each chlorine atom is capable of attacking several ozone molecules. So that a long chain process is involved. A 1% loss of ozone results in a 2% increase in UV rays reaching the earth's surface.

#### 45. What is a Dobson unit?

[Chen AU Jun 2007]

The amount of atmospheric ozone is measured by "Dobson spectrometer" and is expressed in Dobson units (DU). 1 DU is equivalent to a 0.01 mm thickness of pure ozone at the density it possesses if it is brought to the ground level (1 atm) pressure.

In temperate latitude its concentration is 350 DU.

In tropics its concentration is 250 DU.

In sub polar region its concentration is 450 DU.

#### PART - B

1. Discuss the various aspects of prevention and control of noise. (A.U. Dec 2005, Dec 2010)
2. Write briefly the harmful effects of air pollution. (A.U. Dec 2005)
3. Explain the methods of disposal of municipal solid waste. (A.U. Dec 2005)
4. Write a note on disposal of radioactive wastes. (A.U. Dec 2005)
5. Explain the causes, effects and control measure of water pollution. (A.U. June 2005)
6. What are the effects of improper municipal solid wastes management? State the measures recommended for proper management of the solid wastes. (A.U. June 2005, Apr 2015)
7. What are the major pollutants of atmosphere? Enumerate the adverse effects caused by these Pollutants. (A.U. Jan 2006)
8. How will you take care of solid wastes generated in urban areas? (A.U. Jan 2006)
9. Explain Bhopal gas tragedy. (A.U. Jan 2006)
10. Explain the effect of CO, SO<sub>2</sub>, Hydrocarbons and chromium on human beings. (A.U. May 2006)

11. Explain the effects of nuclear and radiation pollution. (A.U. May 2006)
12. Discuss the objectives for prevention of hazardous wastes. (A.U. May 2006, Apr 2015)
13. Discuss the major air pollutants and their impact. (A.U. Dec 2006)
14. Explain the various method of controlling air pollution. (A.U.06, 07, Dec 09, Apr 2015)
15. Discuss briefly the disposal of municipal solid waste. (A.U. Dec 2006, Apr 2015)
16. What are the sources of Radioactive pollution? (A.U. Dec 2006, Apr 2015)
17. What are thermal pollution and explain its effects. (A.U. Dec 2006, Dec 2010)
18. Discuss the major soil pollution and their impact. (A.U. May 2007, Dec 11)
19. Explain the various methods of controlling water pollution. (A.U. May 2007)
20. What is the significance of Dissolved Oxygen in rivers? Explain. (A.U. Dec 2007)
21. What are the effects of oil pollution on the oceans? (A.U. Dec 2007)
22. With a flow diagram explain the Activated sludge process for wastewater treatment. (A.U. Dec 2007)
23. Explain the concept of source, path receiver in the control of noise pollution. (A.U. Dec 2007)
24. Discuss the causes and effects of (A.U. May 2008)
  - (i) Air pollution
  - (ii) Water pollution
25. What is noise? Describe briefly the effects of noise on human health (A.U. Dec 2009)
26. What is noise pollution? Explain the methods of reduction of noise pollution. (A.U. Apr 2010)
27. Write short notes on (A.U. Dec 2009)
  - (i) Land filling method for solid waste
28. Discuss the causes, effects and control of marine pollution. (A.U. Dec 09, Apr 10, Dec 11)
29. Describe the sources, effects and control of noise pollution.(Dec 2009, May 11, Dec 2014)

30. Discuss the role of an individual in the prevention of pollution. (A.U. Dec 2009, Dec 2010, Dec 2014, Apr 2015)

31. Discuss soil waste management in detail. (Or)

Give a brief account of solid waste management

(A.U. Apr 2010, Dec 2010, May 2011, Dec 2011, Dec 2013)

32. Write about effect and control measures of air pollution in detail. (A.U. Apr 2010)

33. Explain the different stages of municipal sewage treatment. (A.U. Dec 2010)

34. Define and give two example each for gaseous air pollutant suspended particulate matter, photochemical oxidant and hazardous pollutant.

(A.U. Dec 2010)

35. Discuss the effects of and control of thermal pollution. (A.U. Dec 2010, 2013)

36. Explain the control and prevention measure of municipal solid waste in your area .

(A.U. May 2011)

37. Write about one of the industrial waste water treatment techniques with a neat schematic diagram.

(A.U. May 2011)

38. What are the source health and environmental effects of CO<sub>2</sub>, CO, NO<sub>2</sub>, and SO<sub>2</sub>?

(A.U. May 2011)

39. Write about water pollutants.

(A.U. May 2011, Dec 2013)

(A.U. May 2011)

40. Describe the various chemical and photochemical reactions in the atmosphere.

(A.U. May 2013 Dec 2014)

41. Write informative notes on water treatment processes.

(A.U. Dec 2014)

42. What is meant by acid rain? How does it formed? Explain its impact on Environment.

(A.U. 07, 09)

43. Explain the mechanism of ozone layer depletion.

(A.U. Dec 2005)

44. Explain the mechanism of formation of acid rain.

(A.U. Dec 2007)

45. Discuss the possible mechanism of stratospheric ozone depletion.

(A.U. Dec 2007)

46. Explain the following,

(A.U. Dec 2007, Dec 2010)

- (i) Ozone depletion.

### **UNIT III**

### **NATURAL RESOURCES**

Forest resources: Use and over-exploitation, deforestation, case studies- timber extraction, mining, dams and their effects on forests and tribal people – Water resources: Use and overutilization of surface and ground water, dams-benefits and problems – Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies – Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies – Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources. Energy Conversion processes – Biogas – production and uses, anaerobic digestion; case studies – Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification – role of an individual in conservation of natural resources – Equitable use of resources<sup>39</sup> for sustainable lifestyles. Introduction to Environmental Biochemistry: Proteins – Biochemical degradation of pollutants, Bioconversion of pollutants. Field study of local area to document environmental assets – river/forest/grassland/hill/mountain.

### **NATURAL RESOURCES**

#### **PART A**

- 1. What are renewable resources? Give examples.**

**[A.U Dec 2014]**

These resources are capable of being regenerated by ecological process within a reasonable time period. They have the potential to renew themselves.

Ex, Soil, water, air, wildlife, natural vegetation.

- 2. How are forest classified?**

1. Evergreen forests.
2. Deciduous forests.
3. Coniferous forests.

- 3. Mention same important causes of over exploitation.**



Over exploitations of forest wealth in developing countries occurs in the following ways,

- (a) Increasing agricultural production.
- (b) .Increasing industrial activities.

**4. What are the preventive measures of deforestation?**

- 1) Steps should be taken by the government to discourage the migration of people into the islands from mainland.
- 2) To counter the depletion of forest areas, tree plantation programs have been started.
- 3) Education and awareness programmes must be conducted.
- 4) Strict implementation of law of Forest Conservation Act.

**5. Define sustainable forestry**

**[Chen AU Dec 2005]**

Sustainable forestry is the optimum use of forest resources, which meet the needs of the present without compromising the ability of future generations to meet their own needs.

**6. Write any two functions of forests.**

**[Chen A.U. Jun 2006]**

- 1. Forests perform very important functions both to humans and to nature.
- 2. They are habitats to millions of plants, animals and wildlife.
- 3. They recycle rainwater and remove pollutants from air.
- 4. They control water quality and quantity.

**7. What are the causes of deforestation?**

**[Chen A.U. Jun 2006, Dec 2010]**

- 1. Developmental projects.
- 2. Mining operations.
- 3. Raw-materials for industries.
- 4. Fuel requirements.
- 5. Shifting cultivation.
- 6. Forest fires.

**8. Differentiate between deforestation and forest degradation.**

**[Chen A.U. Dec 2007, Dec2010]**

**Forest Degradation**

- (i) It is the process of deterioration of forest materials.

**Deforestation**

It is the process of destruction of forest materials.



- |                       |                      |
|-----------------------|----------------------|
| (ii) Slow process     | Rapid process.       |
| (iii) Can be removed. | Cannot be recovered. |

### 9. What are the consequences of timber extraction?

1. Large scale timber extraction causes deforestation.
2. Timber extraction leads to soil erosion, loss of fertility, landslides and loss of biodiversity.
3. Timber extraction also leads to loss of tribal culture and extinction of tribal people.
4. Timber extraction reduces thickness of the forest.

### 10. List any four adverse effects of mining.

[TNV A.U. Dec 2009, 2013]

1. During mining operations, the vibrations are developed, which leads to earthquake.
2. When materials are disturbed in significant quantities during mining process, large quantities of sediments are transported by water erosion
3. Noise pollution is another major problem from mining operations.
4. Mining reduces the shape and size of the forest areas

### 11. State the problems caused by the construction of Dam.

[Chen AU Jan 2006]

- (a) Displacement of tribal people.
- (b) Loss of non-forest land.
- (c) Loss of forests, flora and fauna.
- (d) Landslips, sedimentation and siltation occur.
- (e) Stagnation and water logging around reservoirs retards plant growth.
- (f) Breeding of vectors and spread of vector-borne diseases.
- (g) Reservoir induced seismicity (RIC) causes earthquakes.
- (h) Navigation and aquaculture activities can be developed in the dam area.

### 12. What are the effects of dams on tribal?

1. Due to continuous removal of minerals, forest cover, the trenches are formed on the ground, leading to water logged area, which in turn contaminates the ground water.
2. During mining operations, the vibrations are developed, which leads to earthquake.
3. When materials are disturbed in significant quantities during mining process, large quantities of sediments are transported by water erosion.

**13. Compare merits and problems of dams. [Chen A.U. Jun 2007]****Merits of dams:**

- (i) Dams are built to control flood and store flood water.
- (ii) Sometimes dams are used for diverting part or all of the water from river into a channel.
- (iii) Dams are used mainly for drinking and agricultural purposes.
- (iv) Dams are built for generating electricity.

**Problems of dams:**

- (i) Displacement of tribal people.
- (ii) Loss of non-forest land.
- (iii) Loss of forests, flora
- (iv) Fauna.
- (v) Water logging and salinity due to over irrigation.
- (vi) Reduced water flow and silt deposition in rivers.
- (vii) Salt water intrusion at river mouth.

**14. Explain flood management.**

- 1. Floods can be controlled by constructing dams or reservoirs.
- 2. Channel management and embankments also control the floods.
- 3. Encroachment of flood ways should be banned.
- 4. Flood hazard may also be reduced by forecasting or flood warning.

**15. Write short note on mineral resources of India.****[Coim A.U. Dec 2009]**

India has the following mineral resources

S.No	Mineral	Place
1.	Iron	Bihar, Orissa, Tamil Nadu, Goa
2.	Coal	A.P, Bihar, MP, West Bengal
3.	Manganese	MP, Orissa, A.P, Rajasthan
4.	Copper	Bihar, A.P, MP, Orissa
5.	Gold	Karnataka, A.P
6.	Aluminum	MP, TN, Bihar, Orissa

7.	Tin	Bihar, Orissa and Rajasthan
8.	Chromium	Bihar, Orissa, MP, TN

**16. State the environmental effects of extracting and using mineral resources.**

**[Chen AU Jun 2005]**

- (i) Devegetation and defacing of landscape.
- (ii) Ground water contamination.
- (iii) Surface water pollution.
- (iv) Air pollution.
- (i) Subsidence of land.

**17. What do you mean by environmental impact?**

**[Chen A.U. Dec 2006]**

**(or)**

**Define environmental impact statement.**

**[Coim. A.U. Dec 2009]**

Environmental impact is nothing but the effect on the natural environment caused by various human actions. It includes two types

- (j) Indirect effects  
Example: Pollution.
- (ii) Direct effects  
Example: Cutting down trees.

**18. Define overgrazing (or) explain overgrazing.**

**[Chen AU Dec 2006]**

Overgrazing is a process of, “eating away the forest vegetation without giving it a chance to regenerate”.

**19. Write any two adverse effects caused by overgrazing.**

**[TNV A.U. Dec 2008][ A.U. May 2008 ,Dec 2013]**

- (i) Land degradation.
- (ii) Soil erosion.
- (iii) Loss of useful species.

**20. What are the types of agriculture?**

The two major types of agricultural systems are

1. Traditional agriculture.
2. Modern agriculture (a) industrialized agriculture.

**21. Enumerate the desired qualities of an ideal pesticide.**

[A.U. Dec 2007]

- (i) An ideal pesticide must kill only the target species.
- (ii) It must be a biodegradable.
- (iii) It should not produce new pests.
- (iv) It should not produce any toxic pesticide vapour.

Excessive synthetic pesticide should not be used.

- (vi) Chlorinated pesticides and organophosphate pesticides are hazardous, so they should be used.

**22. What is water logging?**

[Coim A.U. Dec 2009] [Chen AU Dec 2006, Apr 11]

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

**Problems in water logging:**

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

**23. What are the advantages in conjunctive use of water?[Chen A.U. Dec 2006]**

- (i) Control of water logging.
- (ii) Use of saline water, especially for cooling purposed.
- (iii) Control of salt intrusion in coastal aquifers.
- (ii) Controlled withdrawal of water from ground water aquifer.

**24. What are renewable and non-renewable energy resources?**

[Chen. A.U. Dec 2009][TCY A.U. Dec 2008, Dec 2009, Apr 2015]

Renewable energy resources are natural resources which can be regenerated continuously and are inexhaustible. They can be used again and again in an endless manner.

Examples,

Renewable energy resources: wood, solar energy, wind energy.

Non-renewable energy resources: coal, petroleum.

**25. Differentiate renewable and non-renewable sources of energy. [TNV A.U. Dec 2008, 11]**

**Renewable energy**

1. It is regenerated continuously.
2. In exhaustible
3. It can be used again and again.
4. It is pollution free
5. Available in limited amount in Nature.
6. It is developed in a long period.

**Non-renewable energy**

- Cannot be regenerated.
- Exhausted.
- Cannot be used again.
- It pollutes the atmosphere.
- Available in unlimited amount in nature.
- It is developed in a short period.

**26. What are the objectives of alternate energy sources?**

- (a) To provide more energy to meet the requirements of increasing population.
- (b) To reduce environmental pollution and
- (c) To reduce safety and security risks associated with the use of nuclear energy.

**27. What are the conventional sources of energy for the mankind? [Chen AU Jan 2006]**

Non-renewable energy resources are natural resources, which cannot be regenerated once they are exhausted. They cannot be used again.

**28. State the use of bio-energy as a non-conventional source of energy?**

1. The cost of obtaining bio-energy through bio-gas plant is less than the cost of obtaining energy from fossil fuels.
2. Biomass consumes more CO<sub>2</sub> than is released during combustion of biomass.
3. It provides a stored form of energy and in many cases in a form suitable for vehicle propulsion.

**29. What is geothermal energy?**

**[Coim A.U. Dec 2009]**

The energy harnessed from the high temperature present inside the earth is called geothermal energy.

**30. What is meant by soil erosion?**

**[Chen A.U. Jun 2007]**

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

**31. Explain soil leaching.****[Chen A.U. Dec 2006]**

1. It removes valuable nutrients from the soil.
2. It may carry buried wastes into ground water and contaminates it.

**32. Mention the factors causing soil erosion.****[TCY A.U. Dec 2008]**

1. Water
2. Wind
3. Biotic agents
4. Landslides
5. Construction

**33. What is eutrophication?****[Coim A.U. Dec 2009]**

A large proportion of N and P fertilizers used in crop fields is washed off by the runoff waters and reaches the water bodies causing over nourishment of the lakes. The process of accumulation of nutrients in the water bodies is called eutrophication

**34. What is desertification? Give any two reasons for it. [Apr 2015]**

It is a progressive destruction of arid or semi arid lands to desert.

**Reason:**

1. Deforestation.
2. Overgrazing.
3. Water management.
4. Mining and quarrying.
5. Pollution.

**35. Mention the various causes of desertification.****[Chen AU May 2008, Dec 2009]**

1. Deforestation
2. Over grazing
3. Water management
4. Mining and quarrying
5. Climate changes
6. Pollution

**36. What is desertification? Give two reasons for it. [Chen AU Dec 2006][A.U. Dec 2006]**

It is progressive destruction or degradation of arid or semi arid lands to desert.

Reasons: 1. Deforestation, 2. Overgrazing, 3. Mining & quarrying.

**37. What are the present food problems of the world? [Chen A.U. Dec 2010]**

We know that 79% of the area is covered with water and rest is land, of which most of the areas are forest, desert, mountain, barren area only less percentage of land is cultivated. So the food supplied from the rest of the land is not enough to feed all the people. The problem of population explosion has made it worse. The world population increases and cultivable land area decreases therefore the world food problem arises.

Urbanization is another problem in developing countries which deteriorates the agricultural lands.

**38. What are the effects of over utilization of groundwater? [Chen A.U. Dec 2010]**

1. decrease ground water.
2. Ground subsidence.
3. Lowering of water table.
4. Intrusion of salt water.
5. Earthquake and landslides.
6. Drying up of wells.
7. Pollution of water.

**39. List the advantages and disadvantages of the hydel power. [Chen A.U. Dec 2010]**

**Advantages**

1. Produce electricity
2. Less cost when compared with other methods.
3. It is not harmful to environment.

**Disadvantages**

1. Produce less electricity.
2. It is harmful to aquatic species.
3. It also increases water temperature.



**40. What is an aquifer? Give example.****[Chen A.U. Apr 2011]**

A layer of highly permeable rocks containing water is called an aquifer.

Example

1. Layers of sand and gravel are good aquifer (have good permeability).
2. Clay and crystalline rocks are not aquifers (have poor permeability).

**41. Define the term Nuclear energy.****[A.U DEC2014, A.U.Apr.2015]**

Energy released during a nuclear reaction is called nuclear energy. Nuclear reactors produce the nuclear energy either by nuclear fission (or) nuclear fusion. The nuclear power (or) nuclear energy is clean and safe.

**PART - B**

1. Discuss the causes and ill effects of deforestation. (A.U. Dec 2005, Dec 2014, Apr 2015)
2. Explain briefly the various methods of harvesting solar energy. (A.U. Dec 2005)
3. Write a note on tidal power. (A.U. Dec 2005)
4. What are the measures recommended for conservation of natural resources? (A.U. June 2005)
5. What are the causes of soil erosion and the methods of preventing it? (A.U. Dec 2005, 11)
6. Explain in detail the role of an individual in conservation of natural resources. (A.U. Jan 2006)
7. What are the major causes of deforestation? Discuss its consequences. (A.U. Jan 2006, Dec 09, Apr 2015)
8. Explain the following.
  - (i) Over utilization of surface and ground water.
  - (ii) Adverse effects of agriculture practices away from the farm. (A.U. June 2006)
9. Discuss the different types of energy sources. (A.U. June 2006)

10. What is deforestation and explain its impact on the environment.  
(A.U.Dec 2006, June 2007)
11. Write briefly on the Hydrological cycle. (A.U. Dec 2006)
12. Discuss briefly on the consequences of overdrawing of ground water. (A.U. Dec 2006)
13. Discuss the development of modern agriculture and its effect. (A.U. Dec 2006)
14. Write a note on solar production of electricity. (A.U. Dec 2006)
15. Explain the methods of harnessing tidal power. (A.U. Dec 2006)
16. Explain how the alternate energy sources play an important role in environmental impact. (A.U. May 2007)
17. Write a brief note on changes caused by agricultural and overgrazing.  
(A.U May 2007, Dec 2014)
18. Define the term conservation of natural resources and explain the role of an individual in conservation of natural resources. (A.U May 2007)
19. What are the ecological benefits of forests? (A.U Dec 2007)
20. "Environmental damages caused by mining last long after the mine has closed".  
Explain. (A.U Dec 2007, Apr 2015)
21. Discuss the possible solutions to improve the acceptability of dam projects in Indian Conditions. (A.U. Dec 2007)
22. Explain the adverse environmental impacts of modern agriculture. (A.U. Dec 07, 09)
23. Discuss the effect of modern agriculture. (A.U. Apr 2010, Dec 11)
24. What is deforestation? Enumerate and discuss the various effects of deforestation.  
(A.U. May 2008)
25. Discuss the effects of dams on forests and tribal people. (A.U. May 2008)
26. Discuss the problems of pesticide on modern agriculture (A.U. May 2008, Dec 2010)
27. Discuss the various techniques for harnessing solar energy. (A.U. Dec 2009, Dec 2010)
28. Explain the environmental impacts of mineral extraction and uses. (A.U. Dec 2009, Apr 2015)
29. Write in detail on the role of an individual in conservation of natural resources.

**(A.U. Apr 2010, Dec 2013)**

30. (i) What are minerals and explain the classification of minerals?

(ii) Explain the various food resources.

**(A.U. Apr 2010, Apr 2015)**

31. Explain the following in detail

**(A.U. Dec 2010)**

(1) Desertification

(2) Land degradation

32. Explain the various conventional energy resources.

**(A.U. Dec 2010)**

33. Explain the following in detail

**(A.U. Dec 2010)**

(1) Mineral Resources

(2) Food Resources

34. Explain the following in detail

**(A.U. Dec 2010)**

(1) Desertification

(2) Land degradation

35. Discuss in detail the over-exploitation of forests.

**(A.U. Dec 2010)**

36. What are the ecological services rendered by forests? Discuss.

**(A.U. Dec 2010)**

37. Discuss any four factors responsible for land degradation.

**(A.U. Dec 2010, May 11, Dec 2013)**

38. What are the natural resources availability in India and discuss any two of them.

**(A.U. May 2011)**

39. Discuss the world food problems in detail and how does it affects other resources.

**(A.U. May 2011)**

40. (i) What are the various urban problems related to energy?

**(A.U. May 2011)**

(ii) what is global warming?

**(A.U. May 2011)**

41. What are the benefits and effects of dam construction. (A.U. May 2011, Dec 2013)

42. Discuss the effects of timber extraction on forests and tribal people (A.U. Dec 2013)

43. What is land degradation? Discuss the factors responsible for land degradation.

**[A.U. Dec 2014]**

44. Discuss the production of Biogas. Mention its uses.

[A.U. Dec 2014]

45. With help of a neat diagram explain production of bio-gas

[A.U. Apr 2015]

## UNIT IV

### SOCIAL ISSUES AND THE ENVIRONMENT

From unsustainable to sustainable development – urban problems related to energy – water conservation, rain water harvesting, watershed management – resettlement and rehabilitation of people; its problems and concerns, case studies – role of non-governmental organization environmental ethics: Issues and possible solutions – 12 Principles of green chemistry- nuclear accidents and holocaust, case studies. – wasteland reclamation – consumerism and waste products –environment production act – Air act – Water act – Wildlife protection act – Forest conservation act –The Biomedical Waste (Management and Handling) Rules; 1998 and amendments- scheme of labeling of environmentally friendly products (Ecomark). enforcement machinery involved in environmental legislation- central and state pollution control boards- disaster management: floods, earthquake, cyclone and landslides. Public awareness.

#### PART A

**1. Define the term sustainable development.**

[Chen AU Dec 2005, Dec 2007]

(or)

**What is meant by sustainable development**

[Chen. A.U. Dec 2009][TNV A.U. Dec 2008, Dec 2010 [Chen. A.U. Apr 2011]

Sustainable development is defined as, “meeting the needs of the present without compromising the ability of future generations to meet their own needs”.

**2. What are the important aspects of sustainable development?**

(i) Inter – generational equity

It states that we should hand over a safe, healthy and resourceful environment to our future generations.

(ii) Intra – generational equity

It states that the technological development of rich countries should support the

economic growth of the poor countries and help in narrowing the wealth gap and lead to sustainability.

### 3. Explain the need for water conservation.

- Though the resources of water are more, the quality and reliability are not high due to changes in environmental factors.
- Better lifestyles require more fresh water.
- As the population increases, the requirement of water is also more.
- Due to deforestation, the annual rainfall is also decreasing.
- Over exploitation of ground water, lead to drought.
- Agricultural and industrial activities require more fresh water.

### 4. What are the advantages of rain water harvesting?

[Chen AU May 2008][TNV A.U. Dec 2008, A.U Dec 2014]

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

### 5. Explain the factors affecting watershed.

- The watersheds are found to be degraded due to uncontrolled, unplanned and unscientific land use activities.
- Overgrazing, deforestation, mining, construction activities also affect and degrade various watersheds.
- Droughty climates also affect the watershed.

### 6. List the objectives of watershed management.

[Chen A.U. Dec 2009]

1. To minimize the risks, of floods, drought and landslides.
2. To develop rural areas in the region with clear plan for improving the economy of the region.
3. To manage the watershed for developmental activities like domestic water supply, irrigation, hydropower generation etc.,
4. To generate huge employment opportunities in the backward rain- fed areas to ensure livelihood security
5. To promote social forestry and horticultural activity on all suitable areas of land.

**7. Define the term environmental ethics.****[Chen A.U Dec2011,2013]**

“Environmental ethics refers to the issues, principles and guidelines relating to human interactions with their environment”.

**8. State a few drawbacks of pollution related acts.****[Chen A.U. Dec 2008]**

- The penalties in the act are very small when compared to the damage caused by the big industries due to pollution.
- A person cannot directly file a petition in the court.
- Litigation, related to environment is expensive, since it involves technical Knowledge.
- For small unit it is very expensive to install Effluent Treatment – Plant
- The position of chairman of the boards is occupied by political appointee. Hence it is Difficult to implement the act without political interference.

**9. Define air pollutant according to “air prevention and control of pollution act”.**

The presence of any solid, liquid or gaseous substance in the atmosphere in such Concentration as may be harmful to human beings (or) living creatures or plants or Environments.

**10. What is meant by environmental audit?****[Chen AU Dec 2008]**

Environmental audits are intended to quantify environmental performance and Environmental position. In this way they perform analogous function to financial Audits. It also aims to define what needs to be done to improve on indicators of such Performance and position.

**11.What is meant by ISO 14000?****[Chen A.U. Dec 2008]**

ISO 14000 is the environmental management standards which exist to help Organizations minimize how their operations negatively affect the environment and Comply with applicable laws and regulations.



**12. What are the objectives of public awareness?****[Coim A.U. Dec 2009]**

1. To create awareness among people of rural and city about ecological imbalances, local environment, technological development and various development plants.
2. To organize meetings, group discussion on development, tree plantation programmes, exhibitions.
3. To focus on current environment problems and situations
4. To train our planners, decision – makers, politicians and administrators.
5. To eliminate poverty by providing employment that overcome the basic environmental issues.
6. To learn to live simple and eco-friendly manner

**13. What are the objectives of environmental impact assessment (EIA)****[Coim A.U. Dec 2009]**

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.

**Objectives of EIA**

1. To identify the main issues and problem of the parties.
2. To identify who is the party.
3. To identify what are the problems of the parties.
4. To identify why the problems are arise.

**14. Define urbanization.****[Chen A.U. Dec 2010]**

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

**15. How can global warming be controlled?****[Chen A.U. Dec 2010, Apr 2011]**

1. By reducing the use of fossil fuels.
2. Utilize renewable resources such as wind, solar and hydropower.
3. Plant more trees.
4. Stabilize population growth.
5. Remove atmospheric CO<sub>2</sub> by utilizing photo synthetic algae.

**16. Mention any four fundamental rights of the individual.****[Chen A.U. Dec 2010]**

1. Human right to freedom.
2. Human right to property.



3. Human right to religion.
4. Human right to culture and education.
5. Human right to equality.

**17. What is E-Waste?****[Chen A.U. Dec 2011]**

The waste of electronic equipment's like computers, printers, mobile phones, Xerox machines, calculators, etc. are e-waste.

**35. What do we mean by environment refugees?****[Chen A.U. Dec 2011]**

Environmental refugee is a person displaced due to environment causes, especially land loss, and degradation and natural disaster.

**18. List the objectives of Forest Conservation act.****[Chen A.U. Dec 2013]**

- 1) To protect and conserve the forest
- 2) To ensure judicious use of forest

**19. What are the objectives of water act?****[Che A.U. Dec 2014]**

- (i) prevention and control of water pollution.
- (ii) maintaining or restoring the wholesomeness of water.
- (iii) establishing central and state boards for the prevention and control of water pollution.

**20. What is mean by consumerism? [Apr 2015]**

Consumerism refers to the interrelationship between sellers and buyer.

**21. Define disaster. [AU Apr 2015]**

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

**22. Define flood.**

Whenever the magnitude of water flow exceeds the carrying capacity of the channel within its banks, the excess of water over flows on the surroundings causes flood.

**23. Explain cyclone management.**

- a. Satellite images are used by meteorological departments for forecasting the weather conditions which reveal the strength and intensity of the storm.

- b. Radar system is used to detect the cyclone and is being used for cyclone warning.
- c. For observing the exact location of cyclone, every half an hour satellite pictures are analyzed.
- d. It is difficult to stop the formation of cyclones, but the effect of which is minimized by planting more trees on the coastal belt, construction of dams, dykes, embankments, wind breaks.

**24. What are landslides?****[Chen AU May 2008, Dec 2014]**

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

**25. What are the harmful effects of landslides?****[Coim A.U. Dec 2009]**

- (iii) Landslides block the roads and diverts the passage
- (iv) Erosion of soil increases.
- (v) Sudden landslides damage the houses, crop yield, live stock etc.

**26. How does earthquake occur?**

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

**27. Define the term Tsunami.****[Coim. A.U. Dec2009]**

A tsunami is a large wave that is generated in a water body when the sea floor is deformed by seismic activity. This activity displaces the overlying water in the ocean.

**28. Differentiate between pollution prevention and pollution control. [TNV A.U. Dec 2009]**

S.No	Pollution prevention	Pollution control
1.	It is source reduction which	It is the removal of pollutants from the

	eliminates the creation of pollutions	polluted part.
2.	Environment degradation is avoided	Environmental degradation is minimized.
3.	The efficiency in the use of raw materials, energy. Water is increased	Wastage of raw material energy, water is more
4.	Cost required for environmental protection is low.	Cost required for the environmental protection is high

**29. Give comprehensive definition for air pollution. [Chen A.U. Dec 2010, Apr 2011]**

The presences of one are more contaminants like dust, smoke, mist and odour in the atmosphere, which are injurious to human beings, plants and animal.

**30. Mention four causes of floods. [Chen A.U. Dec 2010]**

1. Heavy rain, rainfall during cyclone causes flood.
2. Sudden snow melt also raises the quantity of water in streams and causes flood.
3. Clearing of forests for agriculture has also increased severity of floods.
4. Reduction in the carrying capacity of the channel, due to accumulation of Sediments cause floods.

**PART – B**

**1. Write short notes on:**

(i) Environmental ethics.

(ii) Wasteland reclamation.

**(A.U. June 2005 A.U.Apr.2015)**

**2. State the important provisions in Environment protection Act, Air Act and Water Act.**

**(A.U. June 2005 May 11)**

**3. Discuss briefly on the Indian Environmental Acts.**

**(A.U. Dec 2005)**

**4. Discuss the agenda for sustainable development.**

**(A.U. Dec 2005, Dec 2010, 11)**

5. What is meant by rain water harvesting? Why is it necessary now-a-days?

(A.U. Jan 2006 May 11, A.U.Apr.2015)

6. Name the laws that have been framed for environmental protection and mention the

Objectives for each act.

(A.U. Jan 2006)

7. Write a note on integrated wasteland development programmed.  
A.U.Apr.2015)

(A.U. May 2006,

8. What is sustainable development and explain its concepts? (A.U. Dec 2006, June 2007)

9. Discuss the agenda for sustainable development.

(A.U. Dec 2006)

10. Write a note on watershed management.

(A.U. Dec 06, 09, May 11, Dec2013)

11. Discuss briefly on Environmental (protection) act 1986.

(A.U. Dec 06, 09, 10, 13)

12. Write briefly on Bhopal disaster and Chernobyl disaster.

(A.U. Dec 06, 09)

13. Explain briefly on environmental protection act with respect to water.

(A.U. May 2007, A.U.Apr.2015)

14. Write briefly on any one of nuclear disaster.

(A.U. May 2007, A.U.Apr.2015)

15. What are the salient features of the following acts?

(i) The Air (Prevention and control of pollution) Act, 1981.

(ii) The Environment (Protection) Act 1986.

(A.U. Dec 2007)

16. Explain the following,

(i) Wildlife Protective Act.

(A.U. Dec 2010, Dec 2014)

(ii) Forest protection Act.

(A.U Dec 2010)

17. Bring out the various details of Wasteland Reclamation Practices.

(A.U. Dec 2009, 11)

18. Describe the measures to conserve water.

(A.U. Dec 2009)

19. Write about resettlement and rehabilitation of people.

(A.U. Apr 2010)

20. Explain the methods to conserve water with suitable example.

(A.U. Apr 2010)

21. Explain in detail the various environmental protection acts and legislation. (A.U. Apr 2010)

22. Explain the power and functions of state pollution control board.

(A.U. Dec 2010)

23. Discuss the energy requirement in detail for sustaining urban life. (A.U. Dec 2010, Dec13)

24 What are components of watershed management? Discuss

(A.U. Dec 2010)

25. Write short note on (A.U. May2011)  
(i) Role of NGO (ii) Water conservation
26. (i) Explain in brief about the Indian pollution regulation (A.U. May2011)  
(ii) Describe the functions of state board and central board according to pollution control
27. Write short notes on nuclear holocaust and accidents (A.U. Dec 2013)
28. What are the objectives of water conservation? How is it carried out? (A.U Dec 2014)
29. What is an earth quake? Enumerate its effects. What measures should be taken to mitigate this disaster? (A.U Dec 2014)
30. Discuss the resettlement and rehabilitation of people, its problems and concerns.
31. What are the various causes of floods? (A.U Dec 2014)
32. What is earthquake? Enumerate its effects. What measures should be taken to mitigate their disaster? (A.U. May 2008, Dec 2013)

## **UNIT V**

### **HUMAN POPULATION AND THE ENVIRONMENT**

Population growth, variation among nations – population explosion – family welfare programmed – environment and human health – human rights – value education – HIV / AIDS – women and child welfare – Environmental impact analysis (EIA) – GIS-remote sensing-role of information technology in environment and human health – Case studies.

## **PART A**

1. Define immigration and emigration. [Coim A.U. Dec 2009]

### **Immigration**

It denotes the arrival of individuals from neighboring population.

### **Emigration**

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

**2. Define Population density.****[Coim A.U. Dec 2009] [Chen A.U. Apr 2011]**

It is expressed as the number of individuals of the population per unit area (or) unit Volume.

**3. Define doubling time with reference in population growth. [Chen A.U. Dec 2008, 2013]**

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

It a nation has 2% annual growth; its population will double in the next 35 year

**4. What are the reasons behind the increased population growth in the less developed nations compared with developed nations? [Chen AU Dec 2007]**

- The rapid population growth is due to decrease in the death rate and increase in the birth rate
- The availability of antibiotics, immunization, increased food production, clean water and air decreases the famine-related deaths and infant mortality.
- In agricultural based countries, children are required to help parents in the fields that's why population increases in the developing countries.

**5. Define population equation.****[Coim A.U. Dec 2008]**

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

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

$I$  = Immigration

$D$  = Death Rate

$E$  = Emigration

**6. Define population equilibrium.****[Chen AU Dec 2006]**

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

**7. What is population explosion? [Chen AU Jun 2007, May 2008][TCY A.U. Dec 2008, Dec 2009, Dec 2010, Apr 2015]**

The enormous increase in population due to low death rate and high birth rate is termed as population explosion.

**8. What are the causes of population explosion?**



- a. Invention of modern medical facilities reduces the death rate
- b. Increase of life expectancy is another important reason for the population

**9. What are the effects of population explosion?****[Chen A.U. Dec 2009]**

- 1. Many of the renewable resources like forests, grass lands are also under threat.
- 2. The increase in population will increase disease, economic inequity and communal war.
- 3. Overcrowding of cities leads to development of slums
- 4. Lack of basic amenities like water supply and sanitation, education, health, etc
- 5. Unemployment and low living standard of people.

**10. What are the objectives of family welfare programme?****[TNV A.U. Dec 2009]**

- a. Slowing down the population explosion by reducing the fertility
- b. Pressure on the environment due to over exploitation of natural resources is reduced.

**11. What is meant by NIMBY syndrome?****[Chen A.U. Dec 2008]**

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

**12. Write the importance of value education.****[Chen A.U. Dec 2008, 2013]**

- 1. To improve the integral growth of human being.
- 2. To create attitudes and improvement towards sustainable lifestyle
- 3. To increase awareness about our national history, our cultural heritage, constitutional rights, national integration, community development and environment.
- 4. To create and develop awareness about the values and their significance and role.

**13. What are the factors which do not influence transmission of HIV?**

Tears, food, and air, cough, handshake, mosquito, flies, insect bites, urine, saliva during kissing, sharing of utensils, cloths, toilet, bathroom etc.

**14. How does HIV function in human body?**

White blood cell responsible in the formation of antibodies is called T-helper cells. T-helper cells are the key infection fighters in the immune system. The HIV enters into the human body and destroys the T-cells, as a result of which various types in infection diseases occur. Even cancer can easily develop in the HIV infected persons.

**15. Mention some ill effects of HIV / AIDS.****[Chen A.U. Dec 2008, 2011, 2014]**

- a. Large number of death occurs, which affect environment and natural resources



- b. Due to large number of deaths, there is loss of labour and level of production decreases
- c. More water is required for maintaining hygiene in AIDS affected locality
- d. The people affected by HIV, cannot perform work well, due to lack of energy and frequent fever and sweating.

**16. Differentiate between HIV and AIDS.****[Chen AU Dec 2007, Dec2010]**

<b>HIV</b>	<b>AIDS</b>
Human Immuno deficiency virus	Acquired immuno deficiency syndrome
It is a virus	It is a disease

**17. What are the major precautions to avoid AIDS?****[Chen AU May 2008]**

- a. Avoid indiscriminate sex and encourage the use of condoms and also avoid the use of sharing razors needles and syringes.
- b. Prevention of blood borne HIV transmission
- c. Aids awareness programmes should be encouraged
- d. Counseling services should be provided.

**18. Write the expansion for HIV and AIDS****[TCY A.U. Dec 2008]**

HIV: Human immune deficiency Virus

AIDS: Acquired Immune Deficiency Syndrome

**19. State the role of information technology in Environment.****[Coim A.U. Dec 2009][Chen AU Jan 2006]**

Information technology plays a vital role in the field of environmental education. Information technology means collection, processing, storage and dissemination of information. A number of software's have been developed to study about the environment.

**20. What is crude birth rate and total fertility rate?****[Chen AU Dec2010]****Birth rate**

It is the number of live birth per 1000 people in a population in a given year.

**Total fertility rate (TFR)**

It is the average number of children delivered by a women in her life time.

The TFR value varies from 2 in developed countries to 4.7 in developing countries.

**21. Define population momentum.**

**[Chen AU Dec2011]**

Population momentum refers to population growth at the national level, which would occur even, if levels of childbearing immediately declined to replacement level. For countries with above replacement fertility (greater than 2.1 children per women) population momentum represents natural increase to the population. For below replacement countries momentum corresponds to a population decline.

**22. What is HDI?**

**[Chen AU Dec2011]**

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

**PART – B**

1. Discuss briefly the role of information technology in environmental and human health.  
(A.U. 05, 07, 09, 10, Dec 2010, May2011, Dec13, Dec 2014)
2. Write a short note: Value education. (A.U. June 2005(A.U. Dec 2010, A.U.Apr.2015)
3. Discuss briefly on the reasons for the population explosion. (A.U.Dec 2005, 06, 11)
4. Discuss the environmental and social impacts of growing population. (A.U. Dec 2005)
5. Write briefly on implementation of family planning programme. (A.U. Dec 2005)
6. Write a note on AIDS in developing countries. (A.U. Dec 2005, A.U.Apr.2015)
7. Discuss the factors influencing the family size. (A.U. Dec 05, 06, 09)
8. Population explosion affects the environment seriously – Discuss. (A.U. Jan- 2006)
9. Deterioration of Environment leads to deterioration of human health. Justify.  
(A.U. Jan 2006)
10. Write notes on the following in relation to human population and environment
  - a. Women and Child welfare. (A.U. Dec 2014, A.U.Apr.2015)
  - b. Human rights.
  - c. Value Education. (A.U. May 2006, Dec 2010, A.U.Apr.2015)
11. What is population dispersion? Explain. (A.U. Dec 2006)
12. Write a note on the various methods of family planning. (A.U. Dec 06,09)

13. What is AIDS? How to prevent it? (A.U. Dec 06,09)
14. Explain the impacts of population growth on environmental issues. (A.U. May 2007)
15. Discuss the population growth variation among nations. (A.U. May 2007, Dec 2014)
16. Write a note on human rights. (A.U. May 2007, A.U.Apr.2015)
17. Draw a typical population pyramid of a developing country and discuss how it is likely to Differ from that of a developed country. (A.U. Dec 2007, 11)
18. Define Human Rights and discuss the salient features of the Universal Declaration of Human Rights by UN. (A.U. May 2007)
19. Outline the various family welfare plans in the post independent India. (A.U. Dec 2007)
20. What are the modes of transmission of HIV and how it can be prevented? (A.U. Dec 2007, Dec 2010, 2013)
21. Discuss the methods and strategies of imparting value education. (A.U. May 2008)
22. Briefly describe the various schemes launched for women and child welfare in India. (A.U. May 2008)
23. Discuss briefly
- (i) The factors that affect human population growth rate.
  - (ii) Human rights.
  - (iii) Value education. (A.U. Dec 2009)
24. Discuss the influence of environmental parameters on human health. (A.U. Dec 2009)
25. Discuss the various issues and measures for women and child welfare. (A.U. Dec 2009, 10, 2013)
26. Explain the objectives and elements of value education. (A.U. Dec 2009)
27. Describe the major choices in modern birth control. (A.U. Apr 2010)
28. Describe the population growth and explain how it effects the nation's growth. (A.U. Apr 2010, Dec 2010, 2013)
29. Explain in detail the role of information technology in environmental engineering.

**(A.U. Apr 2010, Dec 2010, 11, A.U.Apr.2015)**

30. Discuss the necessity of formation of women self -help group. **(A.U. Dec 2010)**

31. Discuss the various age structure of population among nation using age pyramid.

**(A.U. Dec 2010)**

32. The world's population in 10000 years ago has been estimated at about 5 million.

What exponential rate of growth would have resulted in the population in 1850?

Which is estimated to have been 1 billion? Had that rate continued, what would be?

the population in the year 2010.

**(A.U. May2011)**

33. Write short notes on the following.

**(A.U. May2011)**

(i) HIV aids.

(ii) Population exploitation.

34. Write the methods and strategies of imparting v