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UNIT-1
ENVIRONMENT, ECOSYSTEM AND BIODIVERSITY
PART-A

1. What is environment? [A.U. April /May 2011]

The sum total of all the living and non-living things around us influencing one another is called environment.

2. Define Environmental Science. [A.U. Jan. 2009]

The study of the environment, its biotic and abiotic components and their inter relationship is called environmental science.

3. State the need for public awareness for solving environmental problems. [or]

What are the main objectives of environmental awareness? [A.U. Dec. 2009]

The main objectives of environmental awareness are given as follows;

- i) Need of development without destruction of environment.
- ii) Knowledge of different type of environment / hazards.
- iii) Direct relation to the quality of our life.
- iv) Develops a respect over our environment.

4. Define ecosystem. [A.U. June 2007, Dec. 2009, May 2011, Dec. 2012, May 2018]

A group of organisms interacting among them and with environment is known as ecosystem.

5. How the biome does differ from an ecosystem? [A.U. Dec. 2007]

Biome is a set of ecosystems which are exposed to same climatic conditions and having dominant species with similar life cycle, climatic conditions and physical structure. It is a small ecosystem within the ecosystem.

6. What are the types of ecosystem? Give example. [A.U. Nov. 2005]

Ecosystem is classified into,

- a. Terrestrial ecosystem:** Related to land and types of vegetation.
E.g. Grassland ecosystem, forest ecosystem and desert ecosystem.
- b. Aquatic ecosystem:** Related to water, it is further sub classified into two types.
Based on the salt content.
 - i) Fresh water ecosystem**
[a] Running water ecosystems. E.g. Rivers, streams.
[b] Standing water ecosystems. E.g. Pond, lake.
 - ii) Marine ecosystem.**

7. Write the important components of ecosystem and explain them.

[A.U. Jan. 2006, Dec. 2009, June 2012, June 2013, Nov. 2014]

The important components of ecosystem are,

- i) Abiotic or Non-living components.
- ii) Biotic or living Components.

a. Biotic components: Living members in an ecosystem collectively form a community. E.g. plants, animals.

b. Abiotic components: Non-living components in an ecosystem collectively form a community. E.g. light, water.

8. What are producers, consumers? Give example. [A.U. Nov/Dec. 2005][or]

What are the autotrophic and heterotrophic components of an ecosystem?

[A.U. Dec. 2009, Dec. 2008]

Producers [Autotrophs]: Producers synthesis their food themselves through photosynthesis. E.g. All green plants, trees.

Consumers [heterotrophs]: Consumers cannot synthesis their own food and depend directly or indirectly on the producers. E.g. Cat, Rat, Tiger.

9. What are decomposers? Give Example.[A.U. Nov/Dec. 2012]

Decomposers are the organisms which feed on the dead organisms and decompose them into simpler compounds. E.g. Bacteria and Fungi.

10. What is nutrient cycle [or] biogeochemical cycle? [A.U. May 2012]

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

11. Define oxygen cycle.[A.U.Dec.2018]

The cyclic flow of oxygen between the between the biotic and abiotic components is known as oxygen cycle.

12. Define Ecological succession. [A.U.May 2005, Dec. 2011,Dec. 2014]

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

13. What are the characteristic features of desert Ecosystem? [A.U.Dec. 2008]

The characteristic features of desert ecosystem are given as,

- i) The desert air is dry and the climate is hot.
- ii) Annual rainfall is less than 25 cm.
- iii) The soil is very poor in nutrients and organic matter.

14. What is biodiversity? [A.U.May2011, Dec. 2012,May2015, May 2014,Nov. 2015]

Bio diversity is the variety and variability among all groups of living organisms and the ecosystem in which they occur.

15. Define Genetic biodiversity. [A.U. Dec. 2008, Dec. 2007]

Genetic diversity is the diversity within the species i.e., variation of genes within the species.

16. Define species biodiversity. [A.U. April/May 2017]

Species diversity is the diversity between different species. The sum of varieties of all the living organisms at the species level is known as species diversity.

17. What do you understand by the term flora and fauna? [A.U. Dec. 2008]

Flora: Plants present in a particular region is called flora.

Fauna: Animals present in a particular region is called fauna.

18. What are called endangered species? Give examples. [A.U. Nov. 2014, Dec. 2017, Dec.2018]

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.

E.g.

- i) Reptiles : Tortoise, python.
- ii) Mammals : Indian wolf, Red fox.
- iii) Plants : Rauvolflaserpentina , Santalum.

19. What are in-situ and ex – situ conservation of biodiversity? [A.U. Nov. 2012, Dec.2017]

In-situ conservation: It involves protection of flora and fauna within its natural habitat.

Ex situ conservation: It involves protection of flora and fauna outside the natural habitat.

20. What is Red data book?[A.U.Dec.2011]

It is a catalogue of taxa facing risk of extinction.

21. Give any two examples of physical hazard. [A.U. May/June 2016]

Examples of Physical hazard: Radioactive radiations, UV radiations, Global warming, Chloro fluorocarbons.

22. Mention two primary and secondary consumers in grassland ecosystem.[A.U.June 2016]

Primary Consumer: Cows. Buffaloes, Deer, Sheep, etc.

Secondary Consumer: Snakes, Lizards, Birds, Fox, etc.

23. Write the various adoptive features of desert plants. [A.U.April / May 2018]

The various adoptive features of desert plants are given as follows;

- (i) The stem is covered with waxy material, which prevents water loss, by cuticular transpiration. In some desert plants like Aloe and Agave the leaves are thick leathery or succulent.
- (ii) Absence of broad leaves and abundance of spines further protect desert plants from being eaten by animal consumers.
- (iii) The roots in perennial xerophytes are very deep.
- (iv) Many of these plants produce gums and resins as in Acacia, their presence also helps in formation of layers, which prevent water loss.

24. How is Nitrogen fixed in soil? [A.U. April/May 2017]

Nitrogen fixation is carried out naturally in the soil by nitrogen fixing bacteria such as Azotobacteria.

25. Write on nitrogen cycle. [A.U. Nov/Dec.2017]

Nitrogen cycle is the series of processes by which nitrogen and its compounds are inter converted in the environment and in living organisms, including nitrogen fixation and decomposition.

26. Mention two invasive species.[A.U. Nov/Dec.2017]

An invasive species is a species that is not native to a specific location (an introduced Species), and that has a tendency to spread to a degree believed to cause damage to the environment, human economy or human health. **E.g.** Asian Carp [Fish], feral pigs.

27. What are called endemic species [or] endemism? Give examples. [A.U. Dec.2017]

The species confined to a particular area are called endemic species.

E.g. About 33% of the flowering plants, 53% fishes, 60% amphibians, 36% reptiles and 10% mammalian are endemic species in India.

28. Define „Keystone species“ with suitable example. [A.U. April/May 2018]

A keystone species is a predator. The reason for this is that a small population of predators is able to influence the distribution and numbers of many prey species. Predators not only affect prey populations by reducing their numbers, but they also alter the behavior of prey species.

E.g. Grizzly bears, Humming birds.

29. What are indicator species? Give example. [A.U. April/May 2018]

An indicator species is an organism whose presence, absence or abundance reflects a specific environmental condition. Indicator species can signal a change in the biological condition of a particular ecosystem, and thus may be used as a proxy to diagnose the health of an ecosystem. Ex: Plants or lichens sensitive to heavy metals or acids in precipitation may be indicators of air pollution.

30. Define Environmental Education.

Environmental Education is the process of educating the people for preserving quality environment is called environmental education.

31. Define Environmental Engineering.

Environmental Engineering is the application of engineering principles and techniques used to protect and enhance the quality of the environment, public health and welfare.

32. What are the two types of environment? Give example.

The environment can be classified into,

- i) Natural Environment. E.g. Soil, Water, Air, Trees, Radiations, Noise etc.,
- ii) Man-made Environment. E.g. Houses, Road, Railway lines, Parks, etc.

33. What is Hazard?

Hazard is any substance that makes the living things ill. It is expressed in degree.

Hazard = $f[\text{risk} \times \text{exposure} \times \text{Vulnerability} \times \text{response}]$

34. What are the characteristic features of Lake Ecosystem?

The characteristic features of Lake Ecosystem are given as follows;

- i) Lake is shallow fresh water body.
- ii) It helps in irrigation and drinking.
- iii) It is permanent water body with large water resources.

35. What are the characteristic features of pond ecosystem?

The characteristic features of pond ecosystem are given as follows;

- i) Pond is a stagnant fresh water body.
- ii) It is temporary, only seasonal.
- iii) Ponds get polluted easily due to limited amount of water.

36. What are the characteristic features of river ecosystem?

The characteristic features of river ecosystem are given as follows;

- i) It is fresh water, and free flowing water systems.
- ii) Due to mixing of water, dissolved oxygen content is more.
- iii) River deposits large amount of nutrients.

37. What are the characteristic features of ocean ecosystem?

The characteristic features of ocean ecosystem are given as follows;

- i) a large surface area with saline water. Since ship, submarines can sail in ocean; commercial It occupies activities may be carried out.
- ii) It moderates the temperature of the earth.
- iii) It is rich in biodiversity.

38. What is estuarine ecosystem?

An estuary is an area at the mouth of a river, where the river joins the sea.

39. What are the characteristic features of estuarine ecosystem?

The characteristic features of ocean ecosystem are given as follows;

- i) Estuaries are transition zones, which are strongly affected by tides of the sea.
- ii) Water characteristics are periodically changed.
- iii) The living organism in estuarine ecosystems has wide tolerance.
- iv) Salinity remains highest during the summer and lowest in the rain season.

40. Define Ecosystem biodiversity.

The diversity at the ecological or habitual level is known as ecosystem diversity. A large region with different ecosystem can be considered as eco system diversity.

41. What is point richness?

Point richness refers to the number of species found at a single point in a given space.

42. What are α and β – richness?

α – richness [or] α – diversity: It refers to the number of species found in a small homogeneous area.

β – richness [or] β – diversity: It refers to the rate of change in species composition across different habitats.

43. What is habitat fragmentation? [A.U.Dec.2018]

Sometimes the habitat is divided into small and scattered patches. This process is called habitat fragmentation.

44. What are biodiversity hotspots? Give Example [Nov/Dec.2018]

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

- i) Eastern Himalayas.
- ii) Western Ghats.

45. What are the criteria for recognizing hot spots?

The criteria for recognizing hot spots are given as follows;

- i) It should contain important gene pools of plants.
- ii) The richness of the endemic species is the primary criterion for recognizing hot spots.
- iii) The hot spots should have a significant percentage of specialized species.
- iv) The site is under threat.

46. Define vulnerable species.

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

47. What are the merits and demerits of in-situ conservation?

Merits of in-situ conservation:

- i) It is very cheap and convenient method.
- ii) The species gets adjusted to the natural disaster like drought, floods, and forest fires.

Demerits of in-situ conservation:

- i) It is an expensive method.
- ii) The freedom of wildlife is lost.
- iii) The animals cannot survival in natural environment.
- iv) It can be adopted only for few selected species.

UNIT-II ENVIRONMENTAL POLLUTION

PART – A

1. Define environmental pollution and what are the types of pollutants? [A.U. May 2014]

Environmental pollution is defined as any undesirable change in the physical, chemical, biological characteristics of the components of the environment which can cause harmful effects to biotic & abiotic components.

Types:

- (i) Biodegradable pollutants - Decomposed rapidly by natural processes.
- (ii) Non- degradable pollutants – Do not decompose [or] decompose slowly.

2. What are particulate matters? [A.U. April /May 2018]

A mixture of solid particles and liquid droplets found in the air. Some particles, such as dust, dirt, soot, or smoke, are large or dark enough to be seen with the naked eye which produces atmospheric pollution.

3. Define photochemical smog. [A.U. Dec. 2012]

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



4. What are the causes and effects of ozone layer depletion? [A.U. Dec. 2014]

The causes and effects of ozone layer depletion are,

Causes: Presence of

- (i) Chlorofluoro carbon.
- (ii) Hydrofluorocarbon.
- (iii) Bromofluoro carbon.

Effects:

- (i) UV rays cause skin cancer.
- (ii) Affects aquatic forms.
- (iii) Degrade paints, plastics and polymeric material.
- (iv) Increase the average temperature of earth.

5. What is PAN? Write its environmental effects. [A.U. May 2016, April / May 2017]

PAN is Peroxy Acetyl Nitrates formed by the photochemical reaction between nitrogen oxides, hydrocarbons and light.

The environmental effects are given below;

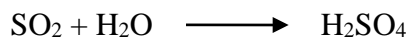
- (i) Damage plants, art.
- (ii) React explosively.
- (iii) Plays a very large role in photochemical smog.

6. Define soil pollution. [A.U. May/June 2013]

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

7. How does acid rain form? Write its environmental impacts.[A.U. Dec. 2013, May 2015,Dec.2018]

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



Effects:

- (i) Acid rain corrodes houses, monuments, statues, bridge and fences.
- (ii) It leads to the corrosion of metals, and the deterioration of paints and stones which increases the maintenance cost.

8. List the sources and effects of marine pollution. [A.U. June 2005, Dec. 2013, Dec. 2014, May 2017]

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

9. Mention the objectives of waste water treatment. [A.U.Dec.2013]

The objectives of waste water treatment are,

- (i) To convert harmful compounds into harmless compounds.
- (ii) To eliminate the offensive smell.
- (iii) To eliminate the solid content of the sewage.
- (iv) To destroy the disease producing microorganisms.

10. What are the causes of noise pollution? [A.U.Dec.2012]

The causes of noise pollution are,

- (i) Road traffic noise.
- (ii) Air traffic noise.
- (iii) Rail traffic noise.
- (iv) Domestic noise.
- (v) Industrial noise.

11. How do you measure the noise pollution? [A.U. Nov. 2011]

The sound intensity is measured in decibel [dB], which is one tenth of the longest unit Bel. One dB is equal to the faintest sound, a human ear can hear.

12. How can you define thermal pollution? [A.U. May / June 2014]

Addition of excess 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 is called thermal pollution.

13. Write the effects due to nuclear hazard. [Or] Mention the effects of nuclear waste in human. [A.U.Nov.2011, April / May 2017]

- (i) Exposure of the brain and central nervous system to high doses of radiation causes delirium, convulsions and death within hours or days.
- (ii) The exposure of eye is vulnerable to radiation.
- (iii) Acute radiation sickness is marked by vomiting, bleeding of the gums and in severe cases, mouth ulcers.

14. What is meant by BOD and COD? [A.U. Dec. 2008, April / May 2011]

BOD [Biological Oxygen Demand]: BOD is the amount of oxygen required for the biological decomposition of organic matter present in the water.

COD [Chemical Oxygen Demand]: COD is the amount of oxygen required for chemical oxidation of organic matter present in the water.

15. What is Noise pollution? [A.U. Nov. 2012, Nov. 2013, April / May 2015, May 2018]

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

16. Define pollution. [A.U. May / June 2014]

Pollution is defined as “the unfavorable alteration of our surroundings”.

17. What are the causes of thermal pollution? [A.U. May / June 2016]

The causes of thermal pollution are,

- (i) Nuclear power plants.
- (ii) Coal-fired power plants.
- (iii) Industrial effluents.
- (iv) Domestic sewage.
- (v) Hydro-electric power.

18. What are biomedical wastes? Give example. [A.U. April / May 2018]

The wastes which are generated in hospitals, blood banks, medical shops, nursing homes etc., and mainly include organic materials.

E.g. Human anatomical wastes, discarded medicines, cytotoxic drugs, infectious waste, needles, syringes.

19. What is bioconversion of pollutants? Give example.[A.U. April / May 2018]

Bioconversion is the conversion of organic materials into usable products or energy sources by biological processes or agents, such as certain microorganisms.

E.g. Plant & Animal waste materials.

20. Define marine pollution. [A.U. April / May 2018]

The discharge of waste substances into the sea resulting in harm to living resources, hazards to human health, hindrance to fishery and impairment of water quality is called marine pollution.

21. Define Air pollution.

Air pollution may be defined as the presence of impurities in excessive quantity and duration to cause adverse effects on plants, animals, human beings and materials.

22. How will you control air pollution?

The air pollution can be controlled by the following methods;

- (i) Source correction methods [Substitution of raw materials, process modification].
- (ii) Pollution control equipments [Cyclone separator, Electrostatic precipitators].
- (iii) Enforcing laws, regular monitoring & maintenance.
- (iv) Planting more trees.

23. What are the different sources of air pollution?

The different sources of air pollution are,

- (i) Natural Sources - Dust storms, Volcanoes, Lightning, Sea salt, Smoke, Forest fires.
- (ii) Man-made or anthropogenic sources - Agricultural activities, Industrial growth, Domestic wastes, Automobile exhausts.

24. List some of the effects of air pollution on physical properties of atmosphere.

The effects of air pollution on the physical properties of atmosphere are,

- (i) Decrease in the visibility.
- (ii) Reduction of Solar radiation.
- (iii) Effects on weather conditions.
- (iv) Effects on atmospheric constituents.

25. How air pollution can be controlled at source?

Air pollution can be controlled at source by,

- (i) Proper use of the existing equipment.
- (ii) Change in processes.
- (iii) Modification or replacement of equipment.
- (iv) Installation of controlling equipment.

26. List the major water pollutants with example.

The major water pollutants are,

- (i) Untreated sewage & effluent [Organics].
- (ii) Heavy metals [Mercury, Lead & Cadmium].
- (iii) Inorganics in ground water [Phosphates, Sulphates, and Carbonates].
- (iv) Biological contaminants [Algae in water bodies].

27. Define water pollution.

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

28. What are solid wastes?

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

29. What is point and non –point sources of water pollution?

Point Sources: These are discharged pollutants at specific locations through pipes, ditches into bodies of surface water.

Non –Point sources: They are large land areas that pollute water by runoff, sub surface flow or deposition from the atmosphere.

UNIT –III
NATURAL RESOURCES

PART – A

1. What are renewable and non-renewable energy sources? [Or] Distinguish between renewable and non-renewable energy sources [A.U. Nov / Dec. 2009, May / June 2010]

Renewable energy sources: They are natural resources which can be regenerated continuously. **E.g.** Solar energy

Non-renewable energy sources: They are natural resources which cannot be regenerated continuously. **E.g.** Nuclear energy

2. Define deforestation. [A.U. Dec. 2009]

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

3. Write short notes on mineral resources of India. [A.U. Dec. 2009]

India has following mineral resources

Mineral	Place
Iron	Bihar, Orissa, Tamil Nadu
Coal	AP, MP, West Bengal
Manganese	MP, Orissa, AP

4. State the environmental effects of extracting and using mineral resources. [or] List out any four adverse effects of mining. [A.U. June 2005, A.U. Dec. 2009]

The adverse effects of mining are,

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

5. Define overgrazing. [A.U. Dec. 2006]

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

6. State the problems caused by construction of dams. [A.U. Jan. 2006]

The problems caused by construction of dams are,

- i) Displacement of tribal people.
- ii) Loss of forests and bio-species.
- iii) Water logging.
- iv) Earthquakes.

7. What is desertification? Give two reasons for it. [A.U. Dec. 2008, Dec. 2006, Dec.2018]

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

The reasons for desertification are follows;

- i) Deforestation.
- ii) Overgrazing.
- iii) Mining.

8. What is water logging?[A.U. Dec. 2006, A.U. Dec. 2009]

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

9. Explain soil leaching and its effects. [A.U. Dec. 2006]

Soil leaching is a process in which materials in the soil gradually dissolves and are carried away by water.

Effects:

- i) It removes valuable nutrients.
- ii) It contaminates underground water.

10. Write any two functions of forests. [A.U. June 2006]

The functions of forests are,

- i) They are habitats of millions of plants, animals and wildlife.
- ii) They recycle rainwater and remove pollutants from air.

11. What are the causes of deforestation? [A.U. June 2006]

The causes of deforestation are,

- i) Developmental projects.
- ii) Mining operations.
- iii) Raw- materials for industries.
- iv) Fuel requirements.

12. Compare the merits and demerits of dam. [A.U. June 2007]

Merits:

- i) It can store flood water.
- ii) It is used for agriculture purpose.
- iii) To generate electricity.

Demerits:

- i) Displacement of tribal people.
- ii) Loss of forests.
- iii) Water logging and salinity.

13. What is meant by soil erosion? [A.U. June 2007]

Soil erosion is the process of removal of surface layer of the soil from one place to another.

14. Differentiate between forest degradation and deforestation. [A.U. Dec. 2007]

S.No.	Forest degradation	Deforestation
1.	It is the process of deterioration of forest materials.	It is the process of destruction of forest materials.
2.	Slow process.	Rapid process.
3.	Can be recovered.	Cannot be recovered.

15. Write any two adverse effects caused by overgrazing. [A.U. Dec. 2008, May 2009]

The adverse effects caused by overgrazing are,

- i) Land degradation.
- ii) Soil erosion.

16. What is eutrophication? [A.U. Dec. 2009]

The process of accumulation of excess nutrients [like N, P, and K] in the water bodies is called eutrophication.

17. What is geothermal energy? [A.U. Dec. 2009]

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

18. List the types of nuclear reactor.[A.U. April / May 2018]

The most commonly used nuclear reactors are as follows;

- i) Pressurized water reactor [PWR].
- ii) Boiling water reactor [BWR].
- iii) Natural uranium reactor, gas-graphite [GCR].
- iv) Advanced Gas Reactor [AGR].
- v) Gas-cooled reactor at elevated temperature [HTGCR].
- vi) Heavy water reactor [HWR].
- vii) Fast breeder reactor [FBR].

19. 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 a sea.

20. Why nuclear hazards are so dangerous? [A.U. Dec. 2009]

Radioactive radiation liberated by nuclear hazards affects the cells in the body and the function of glands and organs. It causes genetic disorders even in the subsequent generations.

21. What are the reasons for land degradation? [A.U. May / June 2016]

The reasons for land degradation are,

- i) Population explosion.
- ii) Over utilization of fertilizers and pesticides.
- iii) Damage to top soil.
- iv) Urbanization.

22. Give any two problems caused by high saline soil. [A.U. April / May 2017]

The reasons for land degradation are,

- i) Decrease in soil fertility.
- ii) Decrease in crop yield.
- iii) Ground water contamination.

23. List some ways to protect soil. [A.U. April / May 2018]

The followings are the some ways to protect the soil,

- i) Minimizing the effects of rain fall impacts on the soil.
- ii) Minimizing the volume of runoff water.
- iii) Afforestation.

24. List some of the renewable energy sources.

The renewable energy sources are,

- i) Solar energy.
- ii) Wind energy.
- iii) Hydro energy.
- iv) Geo-thermal energy.

25. What is mining?

Mining is the process of extracting mineral resources and fossil fuels like coal from the earth.

26. What is environmental biochemistry?

Environmental biochemistry involves approaches to treat polluted air, waste water and solid waste using metabolic activities of micro-organisms.

27. What is the aim of environmental biochemistry?

The aim of environmental biochemistry is as follows;

- i) It aims to manufacture products that are environmental friendly.
- ii) It also aims to create a clean ecosystem.

28. What are xenobiotics?

Biochemistry, used in environmental science to understand the effects of environment on living organisms as they interact with environmental pollutants are called xenobiotics.

29. How proteins undergo degradation?

Biological degradation of protein in nature follows four steps,

Amino acid \longrightarrow ammonia \longrightarrow Nitrites \longrightarrow Nitrates

30. What is meant by bioconversion of pollutants?

Bioconversion is the change of pollutants into a source of energy by the action of micro-organisms.

31. What is anaerobic digestion?

Anaerobic digestion is a process of biological process in which micro-organisms break down biodegradable materials in the absence of oxygen.

32. What is bio-gas?

Bio-gas is a mixture of various gases formed by the anaerobic degradation of biological matter in the absence of oxygen.

33. Name some uses of bio-gas.

The uses of biogas are,

- i) Bio-gas is used for cooking food and heating water.
- ii) It is used to run engines.
- iii) It is also used as an illuminant in villages.
- iv) It is used in gas turbines and fuel cells.

UNIT IV
SOCIAL ISSUES AND THE ENVIRONMENT
PART – A

- 1. Define the term sustainable development. [A.U. Dec. 2009, June 2016, Dec.2018]**
Sustainable development is defined as, “meeting the needs of the present generation without compromising the requirements of future generations to their needs”.
- 2. Write the various uses of sustainable development indicators. [A.U. May 2018]**
A statistical measure that gives an indication on the sustainability of social, environmental and economic development.
Uses are,
 - i) Indicators of sustainable development are needed to guide policies and decisions at all levels of society (village, town, city, county, state, region, nation, continent and world).
 - ii) It measures the total land area that is required to maintain the food, water, energy and waste-disposal demands per person, per product or per city.
- 3. Define urbanization. [A.U. Nov / Dec. 2010]**
Urbanization is the movement of human population from rural areas to urban areas for the want of education, health, employment, etc.
- 4. What are the urban problems related to energy? [A.U. May / June 2013]**
The main urban problems related to energy are given as,
 - i) Modern lifestyle uses more number of electrical gadgets. [Fan, washing machine, Refrigerator]
 - ii) Industries using large amount of energy.
- 5. What is a water shed or drainage basin? [A.U.Nov.2017, April / May 2018]**
Watershed is the land area from which water drains under the influence of gravity into a stream, lake, reservoir or other body of surface water.
- 6. Define water shed management. [A.U. May/June 2010]**
The management of rainfall and resultant runoff is called watershed management.
- 7. What are the objectives of water shed management? [A.U. April / May 2010]**
The main objectives of watershed management are,
 - i) To minimize the risk of floods, droughts and landslides.
 - ii) To develop the economy of rural areas.
 - iii) To generate huge employment opportunities.
 - iv) To promote horticulture in all suitable areas.
- 8. State environmental ethics. [A.U. Nov / Dec. 2010, Nov. 2013, May 2018]**
Environmental ethics refers to the issues, principles and guidelines relating to human interactions with their environment.
- 9. How rain water harvesting is applicable in urban areas? [A.U. May / June 2010]**
Harvesting is applicable in urban areas by,
 - i) Percolation pit method.
 - ii) Bore well with settlement tank.
 - iii) Open well method.

10. What are the advantages of rain water harvesting? [A.U. May 2018, Dec. 2008]

The advantages of rain water harvesting are,

- i) Reduction in the use of electricity for pumping water.
- ii) Rise in ground water level.
- iii) Minimizing the soil erosion and flood hazards.
- iv) Upgrading the social and environmental status.

11. Define the term nuclear energy. [A.U. Nov / Dec. 2014]

The energy released during a nuclear reaction [fission & fusion] is known as nuclear energy. It is also called atomic energy.

12. Explain nuclear holocaust. [A.U. Nov/Dec. 2010, Nov. 2017]

Nuclear holocaust is the destruction of biodiversity by nuclear equipments and nuclear bombs.

13. What is meant by rehabilitation?[A.U. Nov / Dec. 2010, April / May 2017]

Rehabilitation involves making the system to work again by allowing the systems to function naturally. It includes replacing the lost economic assets, restore social services.

14. What is the need for waste land development? [A.U. May / June 2010]

The need for waste land development are given as,

- i) To improve the physical structure and quality of soil.
- ii) To avoid over exploitation of natural resources.
- iii) To improve the economic status.

15. What are “E” wastes? [A.U. Nov / Dec. 2011, Dec.2018]

E-wastes are electronic and electrical wastes. The wastes of electronic equipments like computers, printers, mobile phones etc., are E-wastes.

16. What is disaster? State the characteristics. [A.U. Nov/Dec. 2011]

Disaster is a geological process in which a society undergoes severe danger which causes loss of human lives and physical property.

17. What are the draw backs of wildlife [protection] act, 1972? [A.U. April /May 2011]

The main draw backs of wildlife protection act are,

- i) Offenders of the act are not subjected to severe punishment.
- ii) J & K has its own wildlife act, since illegal trade cannot be stopped.
- iii) Personal ownership certificate for some animal articles often serves as a tool for illegal trading.

18. Define floods. [A.U. Nov/Dec. 2010]

Flood is defined as “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”.

19. Mention any four causes of floods. [A.U. Nov/Dec. 2010]

The causes of flood are due to,

- i) Heavy rainfall during cyclone causes flood.
- ii) Sudden snow melt also rises the quantity of water.
- iii) Deforestation.
- iv) Sudden and excess release of water from dams.

20. What is meant by environmental audit? [A.U. Dec. 2008]

Environmental audits are intended to quantify environmental performance and environmental position. It aims to define what needs to be done to improve current problems.

21. What is meant by ISO 14000? [A.U. Dec. 2008]

ISO 14000 is the environmental management standards which exist to help organizations to realize how their operations negatively affect the environment and comply with applicable laws and regulations.

22. State a few drawbacks of pollution related acts. [A.U. Dec. 2008]

The main drawbacks of pollution related acts are,

- i) The penalties in the act are very small compared to the damage caused due to pollution.
- ii) A person cannot directly file a petition in the court.
- iii) Litigation related to environment is expensive.
- iv) Implementation of effluent treatment plant is expensive.

23. What are the objectives of public awareness? [A.U. Dec. 2009]

The main objectives of public awareness are,

- i) To create awareness among people about ecological imbalance, local environment.
- ii) To organize meetings, group discussion on development, tree plantation, etc.
- iii) To focus on current employment problems and situations.

24. Write the salient features of wildlife protection act. [TCY. A.U. Nov / Dec. 2010]

The salient features of wildlife protection act are given as follows;

- i) The act covers the rights and non-rights of forests dwellers.
- ii) It provides restricted grazing in sanctuaries.

25. Define the term tsunami. [A.U. Dec. 2009]

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

26. What are landslides? [A.U. May 2008]

The movements of earthly materials like mud, soil and debris from higher altitude to lower altitude is called landslides.

27. Name some sources of radioactive pollution. [A.U. Dec. 2008]

The sources of radioactive pollution is given as,

- i) Natural sources - Soil, Rocks, Radioactive substances, etc.
- ii) Man-made sources -Nuclear power plants, X-rays nuclear bombs.

28. What are the harmful effects of landslides? [A.U. Dec. 2009]

The harmful effects of landslides are,

- i) Landslides block the roads.
- ii) Soil erosion.
- iii) It causes damage to crop yield, livestock.

29. How is cyclone formed? [A.U. April / May 2017]

Cyclone is a meteorological phenomenon, where intense depressions forming over the open oceans and moving towards the land.

30. What are the important aspects of sustainable development?

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

Intra-generational equity: It states that developed countries should support the economical growth of the poor countries to attain sustainability.

31. Write any two needs for water conservation.

The needs for water conservation are,

- i) Better lifestyle requires more fresh water.
- ii) To meet needs of growing population.

32. What is green chemistry?

Green chemistry is the chemistry that involves design and production of chemicals without polluting the environment.

33. What is ECO-mark?

Eco-mark is a certification mark issued by the Bureau of Indian Standard [BIS] to the environmentally friendly products.

34. What are the causes of earth quakes?

The main causes of earthquakes are given as follows;

- i) It is caused due to disequilibrium in any part of the earth crust.
- ii) Underground nuclear testing.
- iii) Decrease of underground water level.
- iv) Over construction of buildings, volcanic eruptions, etc.

36. Write the steps involved in biomedical waste management.

The following are the steps involved in biomedical waste management;

- i) Generation and Accumulation.
- ii) Handling and Storage.
- iii) Transport and disposal.

UNIT V
HUMAN POPULATION AND THE ENVIRONMENT
PART –A

1. What is crude birth rate and total fertility rate? [A.U. Nov/Dec. 2010]

Birth Rate or Natality: Birth Rate is the number of live birth per 1000 people in a population in a given year.

Total Fertility Rate [TFR]: Total Fertility Rate is the average number of children delivered by women in her life time. It ranges from 2 in developed countries to 4.7 in developing countries.

2. Define doubling time with reference to population growth.[A.U. Nov. 2013]

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

$$T_d \text{ [doubling time]} = 70/r, \text{ where } r = \text{annual growth rate.}$$

If a nation has 2% annual growth, its population will double in next 35 years.

3. What are the reasons for declining birth rate? [A.U. May / June 2010]

The reasons for declining birth rate are,

- i) Non-availability of antibiotics, immunization, decreased food product, water and air.
- ii) Measures to reduce the financial burden in typical families and improve youth employment.

4. Why is variation important within population? [A.U. May / June 2010]

The variation is important within a population in order to improve the economic status of the people and to maintain the population growth. The following variation must be present within population,

- i) Pre-productive population [0-14 years]
- ii) Re-productive population [15-44 years]
- iii) Post productive population [above 45 years].

5. What is population explosion? [A. U. May 2015, Nov. 2015, May 2016, May 2018, Dec.2018]

The enormous increase in population, due to low death rate [mortality] and high birth rate [natality] is termed as population explosion.

6. What are the causes of population explosion?[A.U. April / May 2018]

The causes of population explosion are as follows;

- i) Invention of modern medical facilities.
- ii) Increase of life expectancy.

7. What are the effects of population explosion? [A.U. Dec. 2009]

The various effects of population explosion are given as follows;

- i) Loss of renewable resources.
- ii) Increase disease, economic inequity and communal war.
- iii) Unemployment and low standard of living.

8. Define population density. [A.U. Dec. 2009]

The population density is defined as the number of individuals present per unit area or unit volume.

9. What is meant by human demography? [A.U. April / May 2010]

The study of statistics on human populations including element such as growth rate, age and sex ratio distribution density and their effects on socioeconomic and environmental conditions.

10. What are the major objectives [or] advantages of family welfare programme?

[A. U. Nov / Dec. 2009, April / May 2010, April / May 2015]

The main objectives or advantages of family welfare programme are given as follows;

- i) It slows down the population explosion by reducing the fertility.
- ii) It gives the pressure on environment due to over exploitation of natural resources is reduced.

11. Give any two schemes of human health program initiated by Indian Government on effects of population growth. [A.U. April / May 2010]

The two schemes of human health program initiated by Indian Government on effects of population growth are,

- i) National Vector Borne Disease Control Program [NVBDCP].
- ii) National Iodine Deficiency Disorders control program.

12. Mention any two family welfare programs adopted in India. [A.U. May / June 2016]

Two family welfare programs adopted in India are,

- i) Rural health scheme, 1977.
- ii) National health policy, 1982.

13. Mention any two welfare programs for children adopted in India. [A.U. April / May 2017]

Two welfare programs for children adopted in India are,

- i) Child Development Services Scheme.
- ii) Integrated Child Protection Scheme [ICPS].

14. What is child abuse? [A.U. Nov.2017]

Child abuse is any form of physical, emotional and/or sexual mistreatment or lack of care that causes injury or emotional damage to a child by a parent or other caregiver. Child abuse may include any act or failure to act by a parent or caregiver that results in harm to a child, and can occur in a child's home, or in the organizations, schools or communities the child interacts with.

15. Write on EIA. [A.U. Nov 2017, Dec.2018]

EIA is a formal process of predicting the environmental consequences of any developmental projects. It is used to identify the environmental, social and economical impacts of the project prior to decision making.

16. What is mitigation? [A.U. Nov/ Dec. 2017]

Mitigation is a part of EIA process. It reviews the action taken to prevent or minimize the adverse effects of the project. Mitigation is the effort to reduce loss of life and property by lessening the impact of disasters.

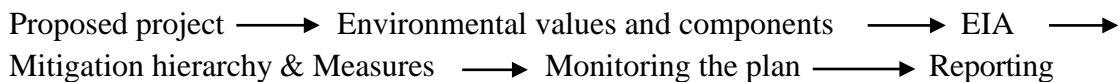
17. What are human rights? [A.U. May/June 2010]

Human rights are the fundamental rights, which are possessed by all human being irrespective of the caste, nationality, gender and language.

18. What are mitigation procedures? Give examples. [A.U. April / May 2018]

- i) Mitigation procedure provides simple context for how the Environmental Mitigation Policy and Procedures fit into an environmental impact assessment process (EIA).
- ii) The procedures in this document focus on how to apply the mitigation hierarchy and completion of mitigation plans, which include considerations for selecting Valued Components, completing an environmental impact assessment, and developing monitoring plans.

- iii) All of these actions are supported by both the collection and exchange of data and information, as well as monitoring and reporting.



E.g. Construction of dams, Precautions to overcome the natural calamities etc.

19. What are human rights? [A.U. May/June 2010]

Human rights are the fundamental rights, which are possessed by all human being irrespective of the caste, nationality, gender and language.

20. Mention any four fundamental rights of the individuals. [A.U. Nov/Dec. 2010]

The four fundamental rights of the individuals are,

- i) Human right to freedom.
- ii) Human right to equality.
- iii) Human right to culture and education.
- iv) Human right to good health.

21. Write a note on value education. [A.U. May 2010, Nov. 2012, Nov. 2013, May 2017]

Value education is an instrument used to analyze our behavior and provide proper direction to younger generations. It teaches them the distinction between right and wrong to be helpful, loving and tolerant.

22. Write the importance of value education. [A.U. Nov / Dec. 2009, Nov. 2013]

The main importance of value education is;

- i) To improve the integral growth of human being.
- ii) To create attitudes and improvement towards sustainable lifestyle.
- iii) To increase awareness about our cultural heritage, national history and integration.

23. Differentiate between HIV and AIDS. [A. U. Dec. 2009]

S.No.	HIV	AIDS
1.	Immuno deficiency virus.	Acquired Immuno Deficiency Syndrome.
2.	It is a virus.	It is a disease.

24. What are the methods of AIDS transmission? [A.U. Nov 2011] [or] What are the sources of HIV infection? [A.U. Nov 2014]

The methods of AIDS transmission are,

- i) Sexual transmission.
- ii) Blood transmission.
- iii) Maternal-Fetal transmission.

25. Give the preventive measures of HIV/AIDS. [A.U. May / June 2010]

Preventive measures of HIV / AIDS are,

- i) Giving health education through TV, Radio, Newspaper, etc.
- ii) By preventing blood borne HIV transmission.
- iii) By giving awareness through health centre.

26. State the role of Information Technology [IT] in environment. [A.U. Dec. 2009, Nov. 2015]

Information technology plays a vital role in the field of environmental education.

- i) Information technology means collection, processing storage and dissemination of information.
- ii) A number of software have been developed so study about the environment.

27. Define GIS, remote sensing. [A.U. May 2018]

GIS - Geographic Information System is a technique of superimposing various thematic maps using digital data on a large number of inter-related aspects.

Remote sensing refers to any method, which can be used to gather information about an object without actually coming in contact with it.

28. Mention the population equation.

$$P_{t+1} = P_t + [B - D] + [I - E]$$

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

B = birth rate, D = death rate, I = Immigration, E = Emigration.

29. Define population equilibrium.

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

30. Write the screening test for AIDS. [A.U. April/ May 2018]

The tests for AIDS are,

- i) ELISA Test.
- ii) Western Blot test.

31. What are vector borne diseases?

The diseases which are spread by mosquitoes are vector borne diseases. Example: Malaria.

32. What is meant by NIMBY syndrome?

NIMBY means "Not In My Back Yard", which describes the opposition of residents to the nearby location of factories, industries, airport etc., which are considered undesirable, even if it is clearly a benefit for many.

33. What are the reason behind the increased population growth in the less developed nations compared with developed nations?

The reasons behind the increased population growth in the less developed nations are,

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