

**PANIMALAR INSTITUTE OF TECHNOLOGY**  
**(Jaisakthi Educational Trust)**  
**Poonamallee, Chennai – 600123**

**QUESTION BANK**

**Subject: GE 8291-Environmental Science & Engineering: 2017R**

**(Common to IV Semester IT and ECE)**

**GE8291 ENVIRONMENTALSCIENCEAND ENGINEERING                      L T P C      3 0 0 3**

**OBJECTIVES:**

- To study the nature and facts about environment.
- To finding and implementing scientific, technological, economic and political solutions to environmental problems.
- To study the interrelationship between living organism and environment.
  - To appreciate the importance of environment by assessing its impact on the human world; envision the surrounding environment, its functions and its value.
  - To study the dynamic processes and understand the features of the earth's interior and surface.
- To study the integrated themes and biodiversity, natural resources, pollution control and waste management.

**UNIT I ENVIRONMENT, ECOSYSTEMS AND BIODIVERSITY**

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Definition, scope and importance of environment–need for public awareness–concept of an ecosystem –structure and function of an ecosystem –producers, consumers and decomposers – energy flow in the ecosystem –ecological succession –food chains, food webs and ecological pyramids –Introduction, types, characteristic features, structure and function of the (a) forest ecosystem (b) grass and 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.

**UNIT II ENVIRONMENTAL POLLUTION**

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Definition–causes, effects and control measures of: (a) Air pollution (b) Water pollution (c) Soil pollution (d) Marine pollution (e) Noise pollution (f) Thermal pollution (g) Nuclear hazards – solid waste management: causes, effects and control measures of municipal solid wastes –role of

an individual in prevention of pollution–pollution case studies–disaster management: floods, earthquake, cyclone and landslides. Field study of local polluted site –Urban / Rural / Industrial / Agricultural.

### **UNIT III NATURAL RESOURCES**

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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 over-utilization of surface and ground water, floods, drought, conflicts over 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. 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 for sustainable lifestyles. Field study of local area to document environmental assets–river/forest/grassland/hill/mountain.

### **UNIT IV SOCIAL ISSUES AND THE ENVIRONMENT**

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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 –climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust, case studies. – waste land reclamation–consumerism and waste products–environment protection act –Air (Prevention and Control of Pollution) act–Water (Prevention and control of Pollution) act –Wildlife protection act –Forest conservation act –enforcement machinery involved in environmental legislation-central and state pollution control boards-Public awareness.

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

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Population growth, variation among nations–population explosion–family welfare programme – environment and human health–human rights–value education–HIV/ AIDS–women and child welfare –role of information technology in environment and human health –Case studies.

## Unit I: Environment, Ecosystem and Biodiversity

### Part – A

#### 1. What are the functions of an eco system? [Apr/ May 2021]

The functional attributes of the ecosystem keep the components running together. Ecosystem functions are natural processes or exchange of energy that take place in various plant and animal communities of different biomes of the world.

For instance, green leaves prepare food and roots absorb nutrients from the soil, herbivores feed on the leaves and the roots and in turn serve as food for the carnivores.

#### 2. What are the causes of threats to biodiversity? [Apr/ May 2021]

Some of the main threats to biodiversity are: 1. Human Activities and Loss of Habitat, 2. Deforestation, 3. Desertification, 4. Marine Environment, 5. Increasing Wildlife Trade and 6. Climate Change.

#### 3. Where from the word environment is derived and what does it refer to? [Apr / May, 2019]

The word environment is derived from the French word “Environ” meaning Surrounding. Each and everything around us is called as environment.

#### 4. What is biodiversity and what is its significance? [Apr / May, 2019]

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

##### Significance of Biodiversity

- Biodiversity is very important for human life, as we depend on plants, micro-organism, and earth’s animals for our food, medicine and industrial products.
- Biodiversity protects the fresh air, clean water and productive land.

#### 5. What do you understand by “species biodiversity”? Give one example. [Apr / May, 2017]

**Species Diversity:** The variability found within the population of species. i.e., Diversity between the species is species diversity.

**For example:** Cat, Lion, Tiger, Cheetah, Panther, Jaguar, and Leopard are different but belong to the same species called cat.

#### 6. Define “keystone species with suitable example. [Apr / May, 2018]

Each species contributes to habitat functioning to some extent, but 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**.

Example: **Elephants are keystone species in grassland ecosystem**

**7. What are indicator species? Give example. [Apr / 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.

**For example:**

- Greasewood indicates saline soil.
- Mosses often indicate acid soil.
- Tubifex worms indicate oxygen-poor and stagnant water unfit to drink.

**8. What is food chain? [Nov / Dec, 2019]**

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

**For example:** (food chain in a grassland ecosystem)

**Plants → rat → Snakes → Eagles**

**9. What is bio-diversity hotspot? Give examples. [Nov / Dec, 2018]**

Bio-diversity hot spots are the geographical regions where the endemic species are present.

The main hot spots as far as India is concerned are Western Ghats and Eastern Himalayas.

**10. Write the criteria to determine hotspot and name the hotspots in India. [Apr / May, 2019]**

The primary criteria for recognizing a hot spot is the endemic species richness. The main hot spots as far as India is concerned are **Western Ghats** and **Eastern Himalayas**.

**11. What is an endangered species? Mention with suitable examples. [Nov / Dec, 2018]**

**Endangered Species:** A species is said to be endangered when its number has been reduced to a critical level or whose habitats, have been drastically reduced.

**For example:** Indian wolf, red fox, sloth bear, red panda, tiger,

**12. Define ecosystem. [Apr / May, 2019, Apr / May, 2018]**

A group of organisms interacting among themselves, and with the environment is known as an ecosystem.

**13. Write the various adaptive features of desert plants. [Apr / May, 2018]**

Desert plants have developed three main adaptive strategies: Succulence, drought

tolerance and drought avoidance.

**14. How does a biome differ from an ecosystem?**

A biome is a small ecosystem within an eco-system. i.e., an ecosystem within an ecosystem. **For example:** A pond in a forest ecosystem is an example of a biome. But an

ecosystem is a group of organisms interacting among themselves and with the environment.

**15. “India is a mega diversity nation” – Justify your answer.**

Among the biologically rich nations, India stands among the top 10 or 15 countries for its great variety of plants and animals, many of which are not found elsewhere. India has 350 different mammals 1,200 species of birds, 453 species of reptiles and 45,000 plant species. It is estimated that 18% of Indian plants are **endemic** to the country and found nowhere else in the world. That is why, India is considered as a mega-diversity nation.

**Part – B**

1. Explain the characteristic features, function and structure of aquatic ecosystem with respect to lakes, rivers and estuaries. [**Apr/ May 2021**]
2. Explain the structure and function of an ecosystem. [**Nov / Dec, 2019**]
3. With a neat diagram discuss the energy flow in ecosystem. [**Apr / May, 2019**]
4. Describe the types, characteristic features, structure and functions of (1) Desert & Grassland Ecosystem. [**Apr / May, 2018**]
5. Describe the types, characteristic features, structure and functions of (1) Forest Ecosystem and (2) Aquatic Ecosystem.
6. What is ecological succession? Explain the different types of ecological Succession. [**Apr / May, 2018**]
7. Substantiate the value of biodiversity with suitable illustrations and statistical evidences. [**Apr/ May 2021, Apr / May, 2018**]
8. What do you understand by hot spots of biodiversity? Name and briefly describe two hot spots of biodiversity that exist in India.
9. Discuss the endangered and endemic species in India.
10. Discuss the various threats faced by Indian biodiversity.
11. Explain any ten control measures man-wildlife conflicts in detail. [**Apr / May, 2018, Nov / Dec, 2018**]

12. Explain in-situ and ex-situ conservation along with their merits and limitations. [Apr/ May 2021, Apr / May, 2018 , Apr / May, 2018]
13. Mention the role of an individual in conservation of natural resources. [Apr / May, 2019]

## Unit II: Environmental Pollution

1. Specify the effects of air pollution. [Apr/ May 2021]

Air pollution is considered as the major environmental risk factor in the incidence and progression of some diseases such as asthma, lung cancer, ventricular hypertrophy, Alzheimer's and Parkinson's diseases, psychological complications, autism, retinopathy, fetal growth, and low birth weight.

2. Name any four air pollutants, and their sources and effects.

Name of the Pollutant	Source	Effect
CO <sub>2</sub>	burning of fossil fuels and deforestation	Global Warming
NO <sub>x</sub> (NO – Nitric Oxide and NO <sub>2</sub> – Nitrogen Dioxide)	burning of fossil fuels and biomass	Acid rain Lung damage
N <sub>2</sub> O – Nitrous Oxide	nitrogen based fertilizers, deforestation and biomass burning	Acid rain Lung damage
Sulphur	burning of sulphur-containing fuels	Breathing problem, acid rain
CFCs	spray cans, discarded or leaking refrigeration and air-conditioning equipment, and burning of plastic products.	O <sub>3</sub> layer depletion

3. What is air pollution? [Apr / May, 2019]

Alteration of the concentration of the constituents of air, due to addition of air pollutants is called air pollution. The air pollutants found in the atmosphere are oxides of carbon, oxides of sulphur, oxides of nitrogen, hydrocarbons, particulate matter and aerosols.

4. What are the major causes for the marine pollution? [Apr / May, 2019, Apr / May, 2018]

**Waste Disposal:** Industrial wastes dumped into the oceans by means of injection bore wells spoils the marine ecosystem.

**Oil Spill:** Leakage of oil tankers and pipelines in the oceans causes oil spills in the oceans.

**5. What is particulate matter? [Apr / May, 2018]**

Particulate matter is the sum of all solid and liquid particles suspended in air, many of which are hazardous. For example: Dust, pollen, soot, smoke and liquid droplets.

**6. How is cyclone formed? [Apr/May, 2017]**

Cyclone is formed when an intense depression forming over the open oceans is moving towards the land. When sea surface temperature is below 25 °C, tropical cyclones are formed and move like a spinning top at the speed of 10 -30 kms/hr.

**7. What is called thermal pollution? [Apr / May, 2019]**

Thermal pollution is defined as the addition of excess of undesirable heat to water that makes it harmful to aquatic life and cause significant changes in normal activities of aquatic communities is known as thermal pollution.

**8. Define ‘noise pollution’. (or) How does a sound cause noise pollution? [Apr/May, 2018]**

The unwanted, unpleasant or disagreeable sound that causes discomfort for all living beings is known as noise pollution. If sound goes beyond 80 dB or more then it causes noise.

**9. Mention the effects of nuclear wastes in humans. [Apr/May, 2017]**

- Radio nuclide iodine - 131 accumulate in the thyroid gland and affects the metabolic activities.
- Nuclear bomb is described as the ultimate weapon of destruction. When the bomb is exploded, the neutrons travel long distance at bullet speed and kill everyone in its path within a day, generally in a few hours.

**10. What do you understand by the term “soil pollution”?**

Degradation of soil and land due to industrial, agricultural and by other human activities is called soil or land pollution.

**11. State the role and responsibility of an individual in the prevention of pollution. [Apr/ May 2021]**

- Plant more trees
- Purchase recyclable, recycled and environmentally safe products
- Use natural gas than coal
- Use CFCs free refrigerators

**Part – B**

1. Elaborate on the causes and impacts of noise pollution and thermal pollution. [**Apr/ May 2021**]
2. Summarize on the importance of disaster management with respect to floods and cyclone based on the recent incidents happened in Kerala and Tamil Nadu.[ **Apr/ May 2021**]
3. Explain the causes, effects and control measures of water pollution. [**Apr / May, 2019, Apr / May, 2018** ]
4. Enlist the rules of management and handling biomedical waste and analyze critically the problems associated with the implementation. [**Apr / May, 2017, Part C**]
5. What are the effects of improper municipal solid wastes management? State the measures recommended for proper management of the solid wastes.
6. Explain the concept of source, path receiver in the control of noise pollution. [**Apr / May, 2017**]
7. What is earthquake? Enumerate its effects. What measures should be taken to mitigate their disaster?
8. With a flow diagram explain the Activated sludge process for waste water treatment.
9. Explain the causes, effects and control measures of air pollution.
10. Explain the causes, effects and control measures of marine pollution. [**Apr / May, 2019, Part C**]
11. Explain the causes, effects and control measures of thermal pollution.
12. Explain the causes and effects of soil pollution. [**Apr/ May 2021, Apr / May, 2019**]
13. What is nuclear hazard? Explain the causes, effects and control measures of nuclear pollution.
14. What are the roles of an individual in prevention of pollution? Explain. [**Apr / May, 2019, Apr / May, 2018**]
15. Give a case study of any anthropogenic (man-made) pollution disaster (a) known to you and discuss the effects of these on the environment (including to human population) in which they happened.[ **Apr / May, 2018, Part C**] (**Hint: Chernobyl and Bhopal gas tragedy**)

**Unit III: Natural Resources**



**Part – A****1. State the benefits of dams. [Apr/ May 2021]**

Recreation

Flood Control

Water Storage

Irrigation

Mine Tailings

Electrical Generation

Debris Control

**2. State about the effects of practicing modern agriculture. [Apr/ May 2021]**

Agriculture contributes to a number larger of environmental issues that cause environmental degradation including: **climate change, deforestation, biodiversity loss, dead zones, genetic engineering, irrigation problems, pollutants, soil degradation, and waste.**

**3. Outline the fertilizer-pesticide problems. [Apr / May, 2019]**

The fertilizer related problems are micronutrient imbalance, nitrate pollution and eutrophication.

**4. Write any two adverse effects caused by overgrazing. [Apr / May, 2019]**

Land degradation, Soil erosion and Loss of useful species (any two)

**5. Define eutrophication. [Apr / May, 2019]**

Excessive use of N and P fertilizers in the agricultural fields leads to another problem, which is not related to the soil but relates to the water bodies like lakes. A large proportion of nitrogen and phosphorous used in the crop field is washed off and along with run-off water reach the water bodies causing over nourishment of the lakes, a process known as Eutrophication.

**6. What are renewable and non-renewable resources? [Apr / May, 2019, Nov / Dec, 2019]**

**Renewable energy resources:** Resources which can be generated continuously in nature and are not inexhaustible. Eg: Wood, Solar energy, wind energy, tidal energy, hydro power energy, biomass energy, bio-fuel, geo-thermal energy.

**Non-renewable energy resources:** Resources which have accumulated in nature over long span of time and cannot be quickly replenished when exhausted. Eg: Coal,

Petroleum, natural gas and nuclear fuels like uranium and thorium.

7. **What is habitat fragmentation?** [Nov / Dec, 2019]

Sometimes the habitat is divided into small and scattered patches. This phenomenon is known as habitat fragmentation. This may be due to either forest fire (either man-made or natural) or some other man-made activities.

8. **Write about afforestation.**[Nov / Dec, 2019]

**Afforestation:** It is the process of planting and growing forests. It usually takes place in areas that have lost their trees.

9. **List some ways to protect the soil.** [Apr / May, 2018]

Reforestation, Till farming, Contour farming, Terrace farming, Alley cropping / Agro-Forestry and Fallowing.

10. **Define the term “Man-induced landslides”.** [Apr / May, 2018]

Movement of earthy materials from higher region to lower region due to gravitational force is known as landslides. Sometimes, the landslide disaster may also happen due to human activities, then it is called “**Man-induced landslides**”.

11. **What is desertification? Give any two reasons for it.** [Nov / Dec, 2018]

The loss of productivity of soil as a consequence of degradation or pervasive dryness is called desertification.

**Reasons:** Deforestation, overgrazing, mining and quarrying

12. **Write any two problems caused by high saline soils.** [Apr / May, 2017]

- Salinity can decrease plant growth and water quality.
- Excess salt affects overall soil health, reducing productivity.
- It kills plants leaving bare soil that is prone to erosion.

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

**Deforestation:**

- Deforestation is defined as the destruction of forest or elimination of forest resources due to many natural or man-made activities.
- Cannot be recovered

**Forest Degradation:**

- It is the process of deterioration of forest materials.
- It can be recovered.

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

- An ideal pesticide must kill only the target species  
It must be biodegradable  
It should not produce new pests  
It should not produce any toxic pesticide vapor

**Part – B**

1. Explain the process of generation and utilization of surfaces water and ground water. [**Apr/ May 2021**]
2. Summarize on the importance of utilization of bio gas and bio fuel in the energy sectors. [**Apr/ May 2021**]
3. What are the ecological benefits of forests, explain the environmental impacts of deforestation? [**Apr / May, 2017**]
4. What is deforestation? Enumerate and discuss the various effects of deforestation. [**Apr / May, 2018**]
5. Discuss the impacts of handling the mineral resources for extraction and subsequent utilization, on the environment. [**Apr / May, 2019, Apr / May, 2018, Apr / May, 2017 (Part C)**]
6. Explain any two conflicts over water, confining to our nation.
7. Explain the adverse environmental impacts of modern agriculture. [**Apr / May, 2017**]
8. Explain the role of an individual in the conservation of natural resources. [**Apr / May, 2018**]
9. What are the measures recommended for conservation of natural resources? [**Apr / May, 2018**]
10. Discuss briefly on the consequences of overdrawing of ground water. [**Apr / May, 2019**]
11. Give a brief account of renewable energy resources and their significance. [**Nov / Dec, 2018**]

**Unit IV: Social Issues and Environment****Part – A**

1. **Mention about the advantages and disadvantages of nuclear energy. [Apr/ May 2021]**

Advantages	Disadvantages
Produces no polluting gases.	Waste is radioactive and safe disposal is very difficult and expensive.
Does not contribute to global warming.	Local thermal pollution from wastewater affects marine life.

Very low fuel costs.	Large-scale accidents can be catastrophic.
Low fuel quantity reduces mining and transportation effects on environment.	Public perception of nuclear power is negative.
High technology research required benefits other industries.	Costs of building and safely decommissioning are very high.
Power station has very long lifetime.	Cannot react quickly to changes in electricity demand.

**2. State about the role of state pollution control board. [Apr/ May 2021]**

The main functions of the State Pollution Control Boards are as follows: To plan a comprehensive programme for prevention, control and abatement of air pollution and to secure the execution thereof. To advise the State Government on any matter concerning prevention, control and abatement of air pollution.

**3. What is meant by wasteland reclamation? [Nov / Dec, 2019]**

Wasteland reclamation is the process of turning barren, sterile wasteland into something that is fertile and suitable for habitation and cultivation.

**4. What are the major effects of global warming? [Nov / Dec, 2019]**

The slight increase of earth's surface temperature, i.e., even by 1 °C can have the following adverse effects,

- Global warming creates melting of mountain glaciers and polar ice and hence sea level will rise and most of the coastal cities will submerge under sea.
- Global warming leads to declining of biodiversity.

**5. Rainwater harvesting is the need of the hour – Comment. [Nov / Dec, 2019]**

Since the monsoon is skipping due to several environmental problems and as we encounter several inter-state, international conflicts over water, unless we save water for the future use it will be a great threat to our biodiversity and our economy especially a developing country like India. Hence rain water harvesting is the need of the hour.

**6. What are the causes and effects of ozone layer depletion? [Apr / May, 2019]**

**Causes:** Chlorofluoro carbons and Bromofluorocarbons present in the atmosphere are the causes of ozone layer depletion.

**Effects:**

- The UV-rays damage genetic materials in the skin cells which cause skin cancer

- The ozone depleting chemicals can contribute to the global warming.

**7. What is a nuclear holocaust? [Apr / May, 2019]**

It means destruction of biodiversity by nuclear equipments and nuclear bombs. **In a holocaust, a large number of living beings are totally destroyed.** Usually, this kind of destruction happens during a nuclear war.

**8. State the environmental ethics. [Apr / May, 2019, Apr / May, 2018]**

The environment ethics literally means the discipline that deals with the moral relationship of human beings to, and also the value and moral status of the environment and its non-human contents.

**9. Define e-waste. [Apr / May, 2018]**

**E-waste:** Comprises of types of waste from electronic and electrical equipment.

In modern world, we are using several electronically powered items like computers, printers, fax machines, mobile phones, Xerox machines, scanners, calculators, etc.

**10. Define acid rain. [Nov / Dec, 2018]**

Oxides of sulphur, nitrogen and hydrocarbons are concentrated in the atmosphere due to industrial activities, decay of organisms and volcanic activities etc. After reacting with water and O<sub>2</sub> in the presence of sunlight, the above gases are converted into H<sub>2</sub>SO<sub>4</sub>, HNO<sub>3</sub>, and HCl respectively. This reaches the earth's surface in the form of rain fall is called acid rain. If the pH falls below 5.6, then it is an acid rain.

**11. Define the term sustainable development. [Apr / May, 2018]**

**Sustainable development:** Improving the quality of human life while living within the carrying capacity of supporting eco-systems. (Very precisely any development without exhausting the natural resources)

**12. Write the various uses of sustainable development indicators? [Apr/May, 2018]**

Sustainable development indicators are statistics that are used to measure social equity, economic growth, institutional capacity, and environmental protection to ascertain the different dimensions are levels of sustainable development.

**13. What do you know about watershed? [Apr / May, 2018]**

A watershed, also called a drainage basin, is a region from which water drains into a stream, lake, reservoir or other body of surface water. **Ex: Himalayas are one of the most critical watersheds in the world.**

**14. When does rehabilitation arise? Mention any one problem to government during**

**rehabilitation. [Apr/May, 2017]**

Rehabilitation arises due to land requirement by the government for various reasons.

Problem to Government:

- (i) Provision for each compensation in lieu of land
- (ii) Government need to serve notice to the people to vacate their land
- (iii) People may not be satisfied with compensation given by the Government

**15. State a few drawbacks of Pollution related Acts.**

- The penalties in the act is 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

**Part – B**

1. Summarize on the sustainable practices required with respect to water conservation, rain water harvesting and watershed management. [**Apr/ May 2021**]
2. What is sustainable development? Discuss the agenda for sustainable development. [**Nov / Dec, 2019**]
3. Write a detailed account on water conservation, rain water harvesting and watershed management. [**Apr / May, 2019, Apr / May, 2018**]
4. What are resettlement and rehabilitation of people? **Explain.** [**Nov / Dec, 2019**]
5. Explain the scope of the subject of environmental ethics and discuss the moral issues associated with the extinction of species.
6. Explain the following: 1. Ozone depletion 2. Global warming [**Apr / May, 2018, Apr / May, 2019**]
7. Explain the following: 1. Wildlife Protective Act 2. Forest Preservative Act. [**Apr/ May 2021, Apr / May, 2019**]
8. What are the salient features of the following acts 1. The Air (Prevention and Control of pollution) Act, 1981 and 2. The Environment (Protection) Act 1986. [**Nov / Dec, 2019, Nov / Dec, 2018, Apr / May, 2017**]
9. Explain the mechanism of formation of acid rain.
10. What are Ozones? Discuss the possible mechanism of stratospheric ozone depletion. [**Apr / May, 2019, Apr / May, 2018**]

## Unit V: Human Population and Environment

### Part – A

**1. Write about the issues related to population explosion. [Apr/ May 2021]**

The population explosion affects natural resources and many sectors of the economy in many ways: Unemployment- Due to the increase in the population the demand for jobs and employment also increases. But, due to a lack of resources and employment opportunities, there are millions of jobless people in India.

**2. Specify the importance towards the consideration of women and child welfare. [Apr/ May 2021]**

The objective of women and child welfare is: (i) To improve the social, economical, health and nutritional status of women. (ii) To improve the physical, mental, intellectual, and nutritional status of children.

**3. Outline the effects of population explosion. [Apr / May, 2019, Apr / May, 2018]**

- Many of the renewable resources like forests, grass lands are also under threat
- Lack of basic amenities like water supply and sanitation, education and health etc.

**4. What is ‘population explosion’? [Apr / May, 2018, Nov / Dec, 2018]**

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

**5. How population density is calculated? [Apr / May, 2019]**

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

Where,  $P_{t+1}$  and  $P_t$  - sizes of population in an area at two different points in time  $t$  and  $t + 1$ ,  $B$  = Birth rate;  $D$  = Death rate;  $I$  = Immigration and  $E$  = Emigration.

**6. What is meant by human demography?**

There occurs a typical fall in death rates and birth rates due to improved living conditions leading to low population growth, a phenomenon called human demography.

**7. Define Doubling Time with reference to population growth.**

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

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

Where,  $r$  = annual growth rate

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

**8. What is value education? [Apr / May, 2019, Apr / May, 2017]**

Value education is an instrument used to analyze our behavior and to provide proper direction to our youths.

**9. What are the reasons behind the increased population growth in the less developed nations compared with developed nations?**

- The rapid population growth is due to decrease in death rate and increase in birth rate
- The availability of antibiotics, immunization, increased food production, clean water and air, decrease in the famine-related deaths and infant mortality

**10. Write about major functions of Family Welfare Programmes in India. [Nov / Dec, 2019]**

- The department formulates plans, policies and programmes. Enacts/amends legislation, guides and coordinates the efforts of both governmental and non-governmental organization working in the field of women and child development.
- These programmes cover welfare and support services, training for employment and income generation, awareness generation and gender sensitization.

**11. Mention any two Family Welfare Programmes adopted in India. [Apr / May, 2017 (Hint: Write any two in Q. No. 9 in Part B)]**

- i. Maternal and Child Health (MCH)
- ii. Universal Immunization Programme

**12. Differentiate between HIV and AIDS.**

**HIV:** Human immune deficiency virus. It's a virus

**AIDS:** Acquired immune deficiency syndrome. It's a disease

**13. Name some tests available to find HIV infection. [Apr / May, 2018]**

- **ELISA** (Enzyme-Linked Immuno Sorbent Assay)
- **Western Blot** (is the most common test used to confirm positive results from an ELISA)

**14. Write about Environmental Impact Analysis. [Nov / Dec, 2018]**

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.

**15. Define 'GIS-remote sensing'. [Apr / May, 2019, Apr / May, 2018]**



**GIS** is a system of hardware, software and procedures designed for support, capture, management, manipulation, analysis, modeling and display of spatially referred data for solving complex planning and management problems.

**Remote sensing** refers to any method, which can be used to gather information about an object without actually coming in contact with it. Application of remote sensing is otherwise called GIS.

## **Part – B**

1. Discuss the factors influencing family size.
2. Draw a typical population pyramid of a developing country and discuss how it is likely to differ from that of a developed country.
3. Discuss the role of Information Technology in the protection of Environment and human health. [**Apr / May, 2019 (Part C), Nov / Dec, 2019, Apr / May, 2018, Nov / Dec, 2018, Apr / May, 2017**]
4. Write a short note on: Value Education. [**Apr/ May 2021**]
5. Define Human Rights and discuss the salient features of the Universal Declaration of Human Rights by UN. [**Apr/ May 2021, Apr / May, 2019**]
6. Discuss the methods and strategies of imparting value education.[**Apr / May, 2018**]
7. Differentiate between HIV and AIDS, explain the pragmatic measures to prevent the transmission of HIV in India. [**Nov / Dec, 2019, Apr / May, 2018, Nov / Dec, 2018, Apr / May, 2017**]
8. What do you mean by environmental impact analysis? What are the methods followed for EIA? [**Apr / May, 2017**]
9. Write short notes on the following family welfare programmes in India. [**Apr / May, 2019, Apr / May, 2018**]
  - i. Maternal and Child Health (MCH)
  - ii. Universal Immunization Programme
  - iii. Child Survival and Safe Motherhood Project
  - iv. India Population Project (IPP)

**COURSE OUTCOMES:**

**Course Name : GE 8291 – Environmental Science & Engineering**

**Year / Semester : II / IV**

**Year of Study : 2021 – 2022 (2017 R)**

**On completion of the course, the students will be able to**

S. No.	Course outcome	State ment
1	<b>C206.1</b>	Remember the importance of environment, ecosystem and biodiversity (R & U)
2	<b>C206.2</b>	Interpret the causes, effects and control measures of various types of pollutions (AN)
3	<b>C206.3</b>	Identify the various types of natural resources, their exploitation consequences and apply methodologies for its conservation (AP)
4	<b>C206.4</b>	Describe the concept of sustainable development and analyze environmental issues (U)
5	<b>C206.5</b>	Apply the fundamental key concepts of various environmental acts and issues associated with their implementation (U)
6	<b>C206.6</b>	Outline the reasons for human population and the role of information technology on environment, human health (U)

**CO-PO matrices**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
<b>C206.1</b>	3	-	-	-	-	-	2	2	-	-	-	1
<b>C206.2</b>	3	-	-	-	-	2	2	1	-	-	-	2
<b>C206.3</b>	3	-	-	-	-		2	2	-	-	-	2
<b>C206.4</b>	3	-	-	-	-	2	2	1	-	-	-	2
<b>C206.5</b>	3	-	-	-	-	2	2	1	-	-	-	1
<b>C206.6</b>	3	-	-	-	2	2	2	1	-	-	-	2
<b>AVG</b>	<b>3.00</b>	-	-	-	<b>2.00</b>	<b>2.00</b>	<b>2.00</b>	<b>1.66</b>	-	-	-	<b>1.66</b>