Introduction to environmental studies

- Multidisciplinary nature of environmental studies;
- Scope and importance; Concept of sustainability and sustainable development

by

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• **Definition and Concept of Environment**

The word environment is derived from the French word environ, meaning external conditions or surroundings that favour the growth of flora and fauna, human beings and their properties and protect them from the effects of pollution.

According to Douglas and Holland (1947), environment is ‘a word which describes, in the aggregate, all of the extrinsic (external) forces influences and conditions, which affect the life, nature, behaviour and the growth, development and maturation of living organisms.

‘Environment covers all the outside factors that have acted on the individual since he began life’. (Woodworth and Marques, 1948)

Environment means the aggregate of a complex set of physical, geographical, biological, social, cultural and political conditions that surrounds an individual or organism and eventually determines its appearance as well as nature of its survival.

• **Types of Environment**

Environment is practically everything that embraces an organism. Out of all the planets comprising the solar system, the only habitable planet to provide all the necessary conditions for existence of life is the Earth. The physical and chemical environments however vary at places and provides unique conditions for living beings to adapt and survive. On the basis of human interference, environment can be categorized as natural, semi-synthetic or artificial.

A **natural environment** is inherent, unaltered and not manipulated by man. Life processes and evolution progresses are unhindered in such an environment. However, one does not often find such places in the present day. The core areas of the biosphere reserve are examples of natural ecosystems.

A **semi-synthetic environment** is the natural environment that is modified partially by human intervention, namely development of lakes, aquaculture tanks and so on.

An **artificial or man-made or synthetic environment** is when the natural environment is deliberately controlled and converted by mankind. For example, aquariums, cities, community parks, paddy fields or the tissue culture laboratories. Kurt Lewin, a German-American psychologist, emphasized three types of environment that manipulate the persona of an individual.

**Physical environment** refers to the physical space, the weather and climatic conditions that influence the organism. The physique and working efficiency of an individual depends much on the climatic conditions. Short and sturdy build-ups are features of humans in cold climates; their reduced body surface area allows more heat to be retained. In hot regions, a thinner and long-limbed structure allows more heat to be lost easily. Races such as Ethiopian or Negroids of Africa, the Caucasians of Europe, Western Asia, Australia and major part of America or Mongolians of East Indies, China, Japan, shows variation in skin colour owing to variation in the level of melanin synthesis. Lighter skin allows more penetration of UV rays to facilitate vitamin D synthesis whereas darker skin prevents the penetration of UV rays. The blacks having more dense bones, hence less buoyant but loose less than 1 percent of the bone mass annually after mid-thirties; Whites with less dense bones lose about 2.5 per cent of bone mass annually and is more prone to aging.
Social and cultural environment is made up of moral values, cultural background and emotional drives that modify life and nature of an individual. is in turn is dependent on the social, economic and political conditions surrounding an individual. Man seems to be the most civilized and skillful of all the organisms. This contributes to a highly systemic social organization.

Psychological environment is the physical, social and cultural environment that limits one’s activities. is sets boundaries for the individual, triggering thought processes and changing behaviours of an individual.

- Multidisciplinary Nature of Environmental Studies

Environmental studies cover every aspect that affect a living organism, as it interacts with the surroundings in its quest to live. Environmental studies are integrative, but the core of the subject comprises biological sciences like zoology, botany, microbiology and physiology. Many environmental concerns can be resolved through application of biotechnology and molecular biology, while bioinformatics can serve as a database at molecular level. Environmental studies are therefore multidisciplinary and aims at unravelling the ways in which human beings and nature correlate, sustaining life and man’s unquenchable thirst for development with limited and finite resources.

Physics, chemistry, biology, anthropology, geology, engineering, archaeology, sociology, economics, statistics, political science, law, anthropology, management, technology and health sciences are all its components. Among these physics, chemistry, geography, geology and atmospheric science help us understand the basic concepts of structural and functional organization, as well as the physical characteristics of our environment.

Data simulation and interpretation needs the application of statistics and computer application, while mathematical science is often used in environmental modelling. The technical solutions for pollution management, waste management, green building and green energy can be found with expertise from the fields of engineering and architecture. e achievement of sustainability at all levels is interwoven with and dependant on international cooperation which in turn rests on international relations. Principles of sustainable development determine the drafts and negotiation of international accords and security issues. International cooperation is an indispensable factor in dealing with global environmental issues like climate change, trans-boundary pollution, trade in hazardous substances, ozone layer depletion, biodiversity loss, etc. Economics enables us to gain a better understanding of the social background needed to achieve growth and development.

Keeping all these in mind, management studies will enable us to formulate policies, followed by legislation for their implementation. The study and treatment of environment is very much connected with philosophy, ethics and cultural traditions that help us achieve our goals sustainably.

The air that we breathe, the water that sustains our lives, the food that gives us energy, the towns and the cities that we live in, in fact everything around us constitute the environment. It is the sum total of all life support systems. Therefore, it is essentially a multidisciplinary approach that brings about an appreciation of our natural world and human impacts on its integrity. It is an applied science as it seeks practical answers to making human civilization sustainable on the earth’s finite resources.
Figure 1: Multidisciplinary nature of environmental studies

- **Segments of Environment**

The environment consists of four segments of the earth namely atmosphere, hydrosphere, lithosphere and biosphere:

1. **Atmosphere**: The Atmosphere forms a distinctive protective layer about 100 km thick around the earth. A blanket of gases called the atmosphere surrounds the earth and protects the surface of earth from the Sun’s harmful, ultraviolet rays. It sustains life on the earth. It also regulates temperature, preventing the earth from becoming too hot or too cold. It saves it from the hostile environment of outer space. The atmosphere is composed of nitrogen and oxygen besides, argon, carbon dioxide and trace gases.

   The atmosphere has a marked effect on the energy balance at the surface of the Earth. It absorbs most of the cosmic rays from outer space and a major portion of the electromagnetic radiation from the sun. It transmits only ultraviolet, visible, near infrared radiation (300 to 2500 nm) and radio waves. (0.14 to 40 m) while filtering out tissue-damaging ultra-violet waves below about 300 nm.

2. **Hydrosphere**: The Hydrosphere comprises all types of water resources oceans, seas, lakes, rivers, streams, reservoirs, polar icecaps, glaciers, and ground water. Oceans represent 97% of the earth’s water and about 2% of the water resources is locked in the polar icecaps and glaciers. Only about 1% is available as fresh water as surface water in rivers, lakes, streams, and as ground water for human use.

3. **Lithosphere**: Lithosphere is the outer mantle of the solid earth. It consists of minerals occurring in the earth’s crusts and the soil e.g. minerals, organic matter, air and water.
4. **Biosphere**: Biosphere indicates the realm of living organisms and their interactions with environment, viz atmosphere, hydrosphere and lithosphere.

- **Scope of environmental studies**

Environmental studies discipline has multiple and multilevel scopes. This study is important and necessary not only for children but also for everyone. The scopes are summarized as follows:

1. The study creates awareness among the people to know about various renewable and non-renewable resources of the region. The endowment or potential, patterns of utilization and the balance of various resources available for future use in the state of a country are analysed in the study.
2. It provides the knowledge about ecological systems and cause and effect relationships.
3. It provides necessary information about biodiversity richness and the potential dangers to the species of plants, animals and microorganisms in the environment.
4. The study enables one to understand the causes and consequences due to natural and human induced disasters (flood, earthquake, landslide, cyclones etc.,) and pollutions and measures to minimize the effects.
5. It enables one to evaluate alternative responses to environmental issues before deciding an alternative course of action.
6. The study enables environmentally literate citizens (by knowing the environmental acts, rights, rules, legislations, etc.) to make appropriate judgments and decisions for the protection and improvement of the earth.
7. The study exposes the problems of over population, health, hygiene, etc. and the role of arts, science and technology in eliminating/ minimizing the evils from the society.
8. The study tries to identify and develop appropriate and indigenous eco-friendly skills and technologies to various environmental issues.
9. It teaches the citizens the need for sustainable utilization of resources as these resources are inherited from our ancestors to the younger generating without deteriorating their quality.
10. The study enables theoretical knowledge into practice and the multiple uses of environment.

- **Importance of Environmental Studies**

The environment studies make us aware about the importance of protection and conservation of our mother earth and about the destruction due to the release of pollution into the environment. The increase in human and animal population, industries and other issues make the survival cumbersome. A great number of environment issues have grown in size and make the system more complex day by day, threatening the survival of mankind on earth. Environment studies have become significant for the following reasons:

1. Environment Issues are being of Global:
   It has been well recognised that environment issues like global warming and ozone depletion, acid rain, marine pollution and biodiversity are not merely national issues but are global issues and hence require international efforts and cooperation to solve them.
2. Development and Environment:
   Development leads to Urbanization, Industrial Growth, Telecommunication and Transportation Systems, Hi-tech Agriculture and Housing etc. However, it has become phased out in the developed world. The North intentionally moves their dirty factories to South to cleanse their own environment. When the West developed, it did so perhaps in ignorance of
the environmental impact of its activities. Development of the rich countries of the world has undesirable effects on the environment of the entire world.

3. Explosive Increase in Pollution
World census reflects that one in every seven persons in this planet lives in India. Evidently with 16 per cent of the world's population and only 2.4 per cent of its land area, there is a heavy pressure on the natural resources including land. Agricultural experts have recognized soil health problems like deficiency of micronutrients and organic matter, soil salinity and damage of soil structure.

4. Need for an Alternative Solution
It is essential, especially for developing countries to find alternative paths to an alternative goal. We need a goal as under:
1. A true goal of development with an environmentally sound and sustainable development.
2. A goal common to all citizens of our planet earth.
3. A goal distant from the developing world in the manner it is from the over-consuming wasteful societies of the “developed” world.

It is utmost important for us to save the humanity from extinction because of our activities constricting the environment and depleting the biosphere, in the name of development.

5. Need for Wise Planning of Development
Our survival and sustenance depend on resources availability. Hence Resources withdraw, processing and use of the products have all to be synchronised with the ecological cycle. In any plan of development our actions should be planned ecologically for the sustenance of the environment and development.

6. Misra (1991) recognized four basic principles of ecology, as under:
(i) Holism, (ii) Ecosystem, (iii) Succession and (iv) Conversation.
Holism has been considered as the real base of ecology. In hierarchical levels at which interacting units of ecology are discussed, are as under:
Misra (1991) has recognised four basic requirements of environmental management as under:
1. Impact of human activities on the environment,
2. Value system,
3. Plan and design for sustainable development,
4. Environment education.

Keeping in view of the goal of planning for environmentally sustainable development, India contributed to the United Nations Conference on Environment and Development (UNCED), also referred to as “Earth Summit” held at Rio de Janeiro, the Capital of Brazil, 3rd-14th June, 1992.

- **Sustainability and sustainable development**

Sustainability is development that satisfies the needs of the present without compromising the capacity of future generations, guaranteeing the balance between economic growth, care for the environment and social well-being.

**Sustainable development** is a concept that appeared for the first time in 1987 with the publication of the *Brundtland Report*, warning of the negative environmental consequences of economic growth and globalization, which tried to find possible solutions to the problems caused by industrialization and population growth.

The definition of sustainability is not nearly as simple as it might seem, likewise with the definition of sustainable development. This is best illustrated by the fact that there are over 200 different definitions to what is sustainable development.
However, the most common definition was defined by the Brundtland Commission in 1987, who documented the sustainable development definition as: “Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”

This implies that we need to look after our planet, our resources and our people to ensure that we can live in a sustainable manner and that we can hand down our planet to our children and our grandchildren to live in true sustainability.

The three pillars of sustainability
But what is sustainability? The definition of sustainability may be taken further and it is widely accepted that to achieve sustainability we must balance economic, environmental and social factors in equal harmony. This may be illustrated with a sustainability Venn diagram, as shown below:

So, to achieve true sustainability we need to balance economic, social and environmental sustainability factors in equal harmony. These may be defined as:

- **Environmental Sustainability**: Environmental sustainability means that we are living within the means of our natural resources. To live in true environmental sustainability, we need to ensure that we are consuming our natural resources, such as materials, energy fuels, land, water…etc, at a sustainable rate. Some resources are more abundant than others and therefore we need to consider material scarcity, the damage to environment from extraction of these materials and if the resource can be kept within Circular Economy principles. Environmental sustainability should not be confused with full sustainability, which also need to balance economic and social factors.

- **Economic Sustainability**: Economic sustainability requires that a business or country uses its resources efficiently and responsibly so that it can operate in a sustainable manner to consistently produce an operational profit. Without an operational profit a business cannot sustain it’s activities. Without acting responsibly and using its resources efficiently a company will not be able to sustain its activities in the long term.

- **Social Sustainability**: Social sustainability is the ability of society, or any social system, to persistently achieve a good social wellbeing. Achieving social sustainability ensures that the social wellbeing of a country, an organisation, or a community can be maintained in the long term.

![Figure 2. Pillars of sustainable development.](image-url)
Taking these three pillars of sustainability further if we only achieve two out of three pillars then we end up with:

- **Social + Economic Sustainability = Equitable**
- **Social + Environmental Sustainability = Bearable**
- **Economic + Environmental Sustainability = Viable**

Only through balancing economic + social + environmental can we achieve true sustainability and a truly circular economy.

On the surface there is little difference between sustainable development and sustainability, the difference is quite subtle. However, it is best illustrated with the quote below…

“Sustainable development is the pathway to sustainability”

**Goals of Sustainability**

In 2012, the United Nations Conference on Sustainable Development met to discuss and develop a set of goals to work toward; they grew out of the Millennium Development Goals that claimed success in reducing global poverty while acknowledging there was still much more to do. The Sustainable Development Goals (SDG) eventually came up with a list of 17 items that included amongst other things:

- the end of poverty and hunger
- better standards of education and healthcare, particularly as it pertains to water quality and better sanitation
- to achieve gender equality
- sustainable economic growth while promoting jobs and stronger economies
- sustainability to include health of the land, air, and sea

Finally, it acknowledged the concept of nature having certain rights, that people have stewardship of the world, and the importance of putting people at the forefront of solving these global issues.

Thus, sustainable development recognizes that growth must be both inclusive and environmentally sound to reduce poverty and build shared prosperity for today’s population and to continue to meet the needs of future generations. It is efficient with resources and carefully planned to deliver both immediate and long-term benefits for people, the planet, and prosperity. The three pillars of sustainable development—economic growth, environmental stewardship, and social inclusion (Fig. 2)—carry across all sectors of development, from cities facing rapid urbanization to agriculture, infrastructure, energy development and use, water availability, and transportation.

Many of these objectives may seem to conflict with each other in the short term. For example, industrial growth might conflict with preserving natural resources. Yet, in the long term, responsible use of natural resources now will help ensure that there are resources available for sustained industrial growth far into the future.

Economic development is about providing incentives for businesses and other organizations to adhere to sustainability guidelines beyond their normal legislative requirements. The supply
and demand market is consumerist in nature, and modern life requires a lot of resources every single day; economic development is about giving people what they want without compromising quality of life, especially in the developing world.

Social development is about awareness of and legislation protection of the health of people from pollution and other harmful activities of business. It deals with encouraging people to participate in environmental sustainability and teaching them about the effects of environmental protection as well as warning of the dangers if we cannot achieve our goals. Environmental protection is the need to protect the environment, whether the concept of 4 Rs (reduce, recycle, recover, and reuse) are being achieved or not. Businesses that are able to keep their carbon emissions low is toward environmental development. Environmental protection is the third pillar and, to many, the primary concern of the future of humanity.

It defines how to protect ecosystems, air quality, integrity, and sustainability of our resources and focuses on the elements that place stress on the environment. It also concerns how technology will drive our greener future; and that developing technology is key to this sustainability and protecting the environment of the future from potential damage that technological advances could potentially bring.

The process of describing indicators helps diverse members of a community reach consensus on what sustainability means. Indicators help put sustainability in concrete terms that demonstrate a new way to measure progress. Concepts like a person’s ecological footprint help people understand how their everyday actions relate to issues that seem beyond the reach of a single individual and explain sustainability.

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MCQ on Unit 1: Introduction to environmental studies

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1. The term ‘Environment’ has been derived from the French word which means to encircle or surround
   a. Environ
   b. Oikos
   c. Geo
   d. Aqua
   Ans. a

2. The objective of Environment studies is
   a. Raise consciousness about environment conditions
   b. To teach environmentally appropriate behaviour
   c. Create an environmental ethic sensitive society
   d. All of the above
   Ans. d

3. Which of the following is not influenced by human activities?
   a. Destruction of mangroves and wetlands
   b. Depletion of ground water
   c. Increased extinction rate of species
   d. None of the above
   Ans. d

4. Which of the following is management option for air pollution?
   a. Regulations and standards
   b. Transport planning
   c. Using CNG as fuel
   d. All of these
   Ans. d

5. Development activities on the hydrosphere cause
   a. Air pollution
   b. Soil pollution
   c. Water pollution
   d. Soil erosion
   Ans. c

6. The basic requirements of human beings are provided by
   a. Industrialisation
b. Agriculture  
c. Nature  
d. Urbanisation  
Ans. c

7. Environment is the life support system that includes  
a. Air  
b. Water  
c. Land  
d. All of the above  
Ans. d

8. Biosphere is  
a. The solid shell of inorganic materials on the surface of the earth  
b. The thin shell of organic matter on the surface of the earth comprising of all the living things  
c. The sphere which occupies the maximum volume of all the spheres  
d. All the above  
Ans. b

9. Atmosphere consists of 79 percent Nitrogen and 21 percent Oxygen by  
a. Volume  
b. Weight  
c. Density  
d. All of these  
Ans. b

10. The word ‘Environment’ is derived from  
a. Greek  
b. French  
c. Spanish  
d. English  
Ans. b

11. Which among the following is a climatic factor?  
a. pressure  
b. humidity  
c. temperature  
d. all of the above  
Ans. d

12. World environment day is on:  
a. 5th May  
b. 5th June  
c. 18th July  
d. 16th August  
Ans. b

13. Which of the following are major environmental issues involved in mining?  
a. air pollution
b. water pollution  
c. soil degradation  
d. all of the above  
Ans. d

14. Sustainable development means  
a. meeting present needs without compromising on future needs  
b. progress of human beings  
c. balance between human needs and the ability of earth to provide the resources  
d. all of the above  
Ans. c

15. The most important remedy to avoid negative impact due to industrialisation is  
a. industry should be closed  
b. don’t allow new industrial units  
c. industry should treat all the wastes generated by it before disposal  
d. industries should be shifted far away from human habitats  
Ans. c

16. Sustainable development will not aim at  
a. Social economic development which optimizes the economic and social benefits available in the present, without spoiling the likely potential for similar benefits in the future  
b. Reasonable and equally distributed level of economic well being that can be perpetuated continually  
c. Development that meets the needs of the present without compromising the needs of future generations to meet their own needs  
d. Maximising the present day benefits through increased resource consumption  
Ans. c

17. The adverse effect of modern agriculture is  
a. Water pollution  
b. Soil degradation  
c. Water logging  
d. All of the above  
Ans. b

18. Soil erosion removes surface soil which contains  
a. Organic matter  
b. Plant nutrients  
c. Both a and b  
d. none of the above  
Ans. a

19. Water logging is a phenomenon in which  
a. Crop patterns are rotated  
b. Soil root zone becomes saturated due to over irrigation  
c. Erosion of soil  
d. None of the above  
Ans. b
20. The impact of construction of dams
   a. Submerged forest
   b. Loss of wild life habitat
   c. Damages downstream ecosystem
   d. All of the above
   Ans. d

21. What would you do to prevent environmental damage
   a. Plant trees
   b. Halt deforestation
   c. Control pollution
   d. All of the above
   Ans. d

22. Environmental impact assessment
   a. is the study of feasibility of a project
   b. is a study of bio-physical characteristics of the environment that may result from a human action
   c. Both a and b
   d. None of the above
   Ans. b

23. Which of the following is the most environment friendly agricultural practice?
   a. Using chemical fertilizers
   b. Using insecticides
   c. Organic farming
   d. None of the above
   Ans. c

24. If in a population, natality is balanced by mortality, then there will be
   a. Decrease in population growth
   b. Increase in population growth
   c. Zero population growth
   d. Over population
   Ans. c

25. Which of the following is not an inexhaustible form of energy?
   a. Water
   b. Wind
   c. Solar
   d. Fossil
   Ans. c

26. Biogas contains mainly
   a. Methane
   b. Propane
   c. Butane
   d. Carbon dioxide
   Ans. a
27. The burning of fossil fuels releases a large amount of
a. Nitrogen into air
b. Sulphur into air
c. Carbon dioxide into air
d. Oxygen into air
Ans. b

28. A poisonous gas given out of a vehicle exhaust is
a. Methane
b. Ethane
c. Carbon dioxide
d. Carbon monoxide
Ans. d

29. The purest form of coal is
a. Anthracite
b. Lignite
c. Peat
d. Bitumen
Ans. c

30. Loss of forest has led to
a. Erosion of fertile soil
b. Global warming
c. Loss of habitat of plants and animals
d. All of the above
Ans. d

31. What are the consequences of excessive mining in an area?
 a. Air and water pollution
   b. Deforestation
   c. Migration of large numbers of population
   d. All of the above
   Ans. d

32. Resources which are directly derived from nature are referred to as
a. Organic resources
b. Natural resources
c. Man-made resources
d. None of the above
Ans. b

33. Resources that take too long a period of time to be used as a resource are called as
a. Renewable resource
b. Non-renewable resource
c. Exhaustible resource
d. Inexhaustible resource
Ans. d
34. The fossil fuel that is derived from the dead remains of plants that grew some 250 million years ago is
   a. Petroleum
   b. Natural gas
   c. Coal
   d. LPG
   Ans. c

35. A resource that cannot be replaced in a reasonably short time is usually referred to as
   a. Renewable
   b. Non-renewable
   c. Natural
   d. Man made
   Ans. b

36. Man-made resources are alternative to natural resources for a variety of reasons. Which of these would not be one of those?
   a. They increase variety and choice
   b. They are cheaper to produce than natural resources
   c. They are made from renewable resources
   d. They are better suited for the purpose for which they will be used
   Ans. c

37. Energy in the rays from the sun is called
   a. Solar energy
   b. Wind energy
   c. Tidal energy
   d. Water energy
   Ans. a

38. Which is a list of renewable resources?
   a. Petroleum, geothermal, wind
   b. Biomass, geothermal, hydropower
   c. Natural gas, wind, biomass
   d. Hydropower, solar, wind energy
   Ans. d

39. Which out of the following are the causes of soil erosion?
   a. Unrestricted grazing
   b. Over cultivation
   c. Deforestation
   d. All of the above
   Ans. d

40. The process of restoring forests that once existed but was removed at some time in the past is known as
   a. Afforestation
   b. Reforestation
   c. Deforestation
d. None of these
Ans. b

41. Red data book contains data of
a. All plant species
b. All animal species
c. Threatened species
d. Economically important species
Ans. c

42. IUCN Headquarters is at
a. Morges, Switzerland
b. Paris, France
c. Vienna, Austria
d. New York, USA
Ans. a

43. Which of the following regions has the maximum diversity?
a. Mangroves
b. Temperate forest
c. Taiga
d. Coral reefs
Ans. d

44. The most important reason for decrease in biodiversity is
a. Habitat pollution
b. Over exploitation
c. Habitat destruction
d. Introduction of exotic species
Ans. c

45. Conservation within the natural habitat is
a. Ex-situ conservation
b. In-situ conservation
c. Ex-vivo conservation
d. In-vivo conservation
Ans. b

46. Which one of the following is not included under in situ conservation?
a. Zoo
b. National Park
c. Wild life Sanctuary
d. Biosphere Reserve
Ans. a

47. Ex-situ conservation includes
a. Zoo
b. Botanical Garden
c. Germplasm Bank
d. All of the above
Ans. d

48. Hotspots are regions of high
   a. Rareism
   b. Endemism
   c. Diversity
   d. Critically endangered population
   Ans. c

49. Endemic species are
   a. Rare species
   b. Species localized in a specific region
   c. Cosmopolitan in distribution
   d. None of these
   Ans. b

50. Which one of the following has the maximum genetic diversity in India?
   a. Tea
   b. Teak
   c. Mango
   d. Wheat
   Ans. c

51. Which one of the following regions in India is a hotspot of biodiversity?
   a. Sundarbans
   b. Western Ghats
   c. Eastern Ghats
   d. Gangetic plains
   Ans. b

52. 5th June is observed as
   a. World environment day
   b. World forest day
   c. World population day
   d. World wildlife day
   Ans. a

53. The unfavourable alteration of environment by human activities is termed as
   a. Ecological disturbance
   b. Ecological degradation
   c. Pollution
   d. Catastrophe
   Ans. b

54. Treated water can be disinfected by adding
   a. Alum
   b. Fluorine
   c. Chlorine
   d. Oxygen
   Ans. c
55. Which of the following does not cause air pollution when used for heating purposes
a. Coal  
b. Petrol  
c. Kerosene  
d. Solar energy  
**Ans. d**

56. A poisonous gas given out of vehicles exhaust is
a. Carbon monoxide  
b. Ethane  
c. Methane  
d. Carbon dioxide  
**Ans. a**

57. Greenhouse effect is linked to
a. Nitrogen oxides  
b. Sulphur dioxides  
c. Carbon dioxides  
d. Carbon monoxides  
**Ans. c**

58. Which out of the following is a measure to control air pollution
a. Reduction in use of fossil fuels  
b. Increasing use of renewable energy resources  
c. Using catalytic convertors in vehicles  
d. All of the above  
**Ans. d**

59. Increase in concentration of toxic level in each trophic level is referred to as
a. Eutrophication  
b. Biomagnification  
c. Bioaccumulation  
d. Bioconcentration  
**Ans. b**

60. Pollutants that are easily manageable and decomposable in nature are called
a. Biodegradable pollutants  
b. Non-biodegradable pollutants  
c. Renewable pollutants  
d. None of these  
**Ans. a**

61. BOD stands for
a. Biotic oxidation demand  
b. Biological oxygen demand  
c. Biological oxidation demand  
d. Biochemical oxygen demand  
**Ans. b**
62. Which gas is responsible for ozone layer depletion around earth?
   a. Carbon dioxide
   b. Chlorofluorocarbons
   c. Oxygen
   d. Nitrogen oxide
   Ans. b

63. What is Kyoto Protocol?
   a. It is an agreement among countries to take steps for reducing global warming.
   b. It is an agreement among countries to take steps for reducing acid rain.
   c. It is an agreement among countries to take steps for planting trees to control pollution.
   d. It is an agreement among countries to start using nuclear energy.
   Ans. a

64. Possible health effects of noise pollution includes
   a. Hearing loss
   b. Hypertension
   c. Cardiovascular effects
   d. All of the above
   Ans. d

65. Which of the following are major causes of land degradation?
   a. Soil erosion
   b. Water logging
   c. Deforestation
   d. Desertification
   Ans. c

66. The main components of photochemical smog is
   a. Water vapors
   b. Nitrogen oxides
   c. Sulphur oxides
   d. All of the above
   Ans. d

67. Which gas is responsible for the global warming?
   a. Nitrogen
   b. Carbon dioxide
   c. Noble gases
   d. Hydrogen
   Ans. b

68. Which country has organized its cabinet meeting under the sea to drag attention of the world towards the Global Warming and its threats?
   a. Maldives
   b. Sri Lanka
   c. Fiji
   d. Indonesia
   Ans. a

69. Which of the following effect is responsible for Global Warming?

a. Greenhouse effect  
b. Radioactive effect  
c. Solar effect  
d. Nuclear effect  
**Ans. a**

70. The two major impacts expected as a result of rising global temperatures are  
a. Higher water levels in lakes and streams but more consistent flooding patterns  
b. Regional climatic changes and a rise in sea level  
c. Longer summers and drier winters  
d. Low water levels in lakes and streams and larger floodplains.  
**Ans. b**

71. How are humans making greenhouse gases of our own?  
a. Burning fossil fuels  
b. Burning forests  
c. With large scale agriculture  
d. All of these  
**Ans. a**

72. Things you can do to decrease global warming include  
a. Reduce the usage of your air conditioner on high  
b. Turn off your light when you are not using them.  
c. Use public transports instead of personal vehicles for transportation.  
d. All of the above  
**Ans. d**

73. Excess atmospheric carbon dioxide increases greenhouse effect as carbon dioxide  
a. Precipitates dust in the atmosphere  
b. Is opaque to infrared rays  
c. Reduces atmospheric pressure  
d. Is heavier than other gases  
**Ans. b**

74. Which of the following is not a potential adverse effect of global warming?  
a. More extreme weather patterns  
b. Retreat of glaciers  
c. Sea level rise  
d. An increase of UV-B radiation  
**Ans. d**

75. Which of the following processes adds to the removal of carbon dioxide from the atmosphere?  
a. Burning fossil fuels  
b. Photosynthesis  
c. Respiration  
d. Deforestation  
**Ans. b**

76. Which is the only country who has not ratified the Kyoto Protocol yet?
a. United States  
b. Australia  
c. Japan  
d. India  
**Ans. a**

**77. Increasing skin cancer and high mutation rate are the result of**

a. Global warming  
b. Ozone depletion  
c. Acid rain  
d. Pollution  
**Ans. b**

**78. A population is a group of**

a. Individual in a family  
b. Individuals in a species  
c. Communities in an ecosystem  
d. Species in a community  
**Ans. b**

**79. The main cause of world population growth in 18th and 19th centuries was**

a. Decrease in birth rates  
b. Decrease in death rates  
c. Industrial revolution  
d. None of these  
**Ans. c**

**80. What is most important factor for the success of animal population?**

a. Natality  
b. Adaptability  
c. Interspecies activity  
d. Unlimited food  
**Ans. b**

**81. The main factors contributing to the decline in death rate in 20th century were**

a. Improved agricultural practices and increased birth rates  
b. Improved health care, sanitation and nutrition  
c. Endemic poverty and low levels of education  
d. European colonization and improved agriculture practices  
**Ans. b**

**82. The world population in 2000 was approximately**

a. 5.1 billion  
b. 2.1 billion  
c. 6 billion  
d. 8 billion  
**Ans. c**

**83. The average life expectancy around the world is currently**

a. Stable
b. Increasing
c. Decreasing
d. Not changing

Ans. b

84. Exponential growth in population occurs when there is
a. A great environment resistance
b. No environment resistance
c. A fixed carrying capacity
d. No biotic potential

Ans. b

85. The disease which wiped out 33% of population of Europe in the 12th and 13th centuries was
a. Cholera
b. Meningitis
c. Plague
d. Diphtheria

Ans. c

86. A human population is small, there is greater chance of
a. Mutation
b. Gene flow
c. Genetic drift
d. Natural selection

Ans. c

87. Which of the following is a problem not associated with population growth?
a. Increased resource consumption
b. Environmental pollution
c. Food and energy shortages
d. None of these

Ans. d

88. Today, the world’s number one problem is:
a. Pollution
b. Population explosion
c. Nuclear proliferation
d. Natural calamities

Ans. b

89. Population explosion has occurred in the last
a. 500 years
b. 300 years
c. 400 years
d. 150 years

Ans. d

90. One of the critical mechanism by which the environment controls population of species is
a. Spread of disease  
b. Removal of excreta  
c. Supply of food  
d. Control on death rate  
**Ans. d**

91. **Demographic features of developing countries are**  
a. High infant mortality, low fertility, young age distribution and uneven population growth  
b. High fertility, high density, high mortality rate and young age distribution  
c. High fertility, falling mortality rate, rapid population growth and young age distribution  
d. High density, high mortality, uneven population growth and very old age distribution  
**Ans. c**

92. **Group of interbreeding organisms found in a particular area is**  
a. Population  
b. Community  
c. Tribe  
d. Density  
**Ans. a**

93. **In India, human population has higher number of younger age group because of**  
a. Long life span and low birth rate  
b. Short life span and high birth rate  
c. Short life span and low birth rate  
d. Birth rate is equal to death rate  
**Ans. b**

94. **Which of the following three R’s are regarded as environment friendly?**  
a. Reduce, Reuse, Recycle  
b. Read, Register, Recall  
c. Random, Reduce, Recall  
d. Reduce, Rebuild, Restrict  
**Ans. a**

95. **The objective of environmental education is**  
a. Raise consciousness about environmental education  
b. To teach environmentally appropriate behaviour  
c. Create an environmental ethic that fosters awareness about ecological inter-dependence of economics, social and political  
d. All of the above  
**Ans. d**

96. **Environmental education is important only at**  
a. Primary school stage  
b. Secondary school stage  
c. Collage stage  
d. All stages  
**Ans. d**

97. **The environment which has been modified by human activities is called**
a. Natural environment  
b. Anthropogenic environment  
c. Modern environment  
d. Urban environment  
   Ans. b

98. Which option is correct, when we only accomplish two out of three pillars of Sustainable Development?
   a. Economic + Environmental Sustainability = Viable  
   b. Social + Environmental Sustainability = Bearable  
   c. Social + Economic Sustainability = Equitable  
   d. None of the above  
   Ans. d

99. The word ‘Sustainable Development’ came into existence in the year?
   a. 1992  
   b. 1978  
   c. 1980  
   d. 1987  
   Ans. C

100. The United Nation’s Commission on Sustainable Development (CSD) was started by the UN General Assembly in the year.
    a. 1995  
    b. 1994  
    c. 1993  
    d. 1992  
    Ans. D