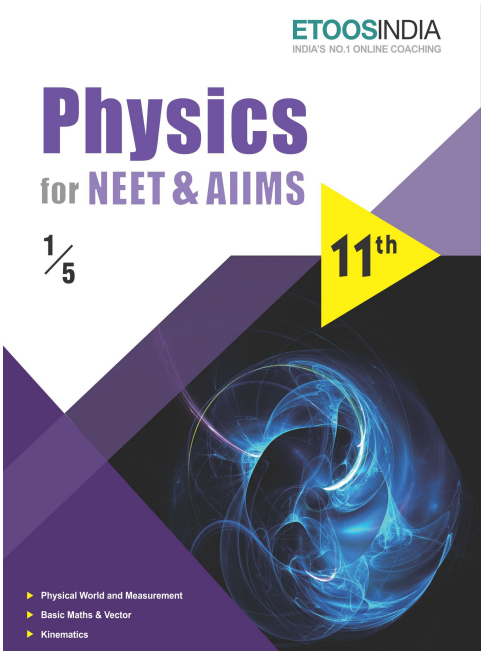
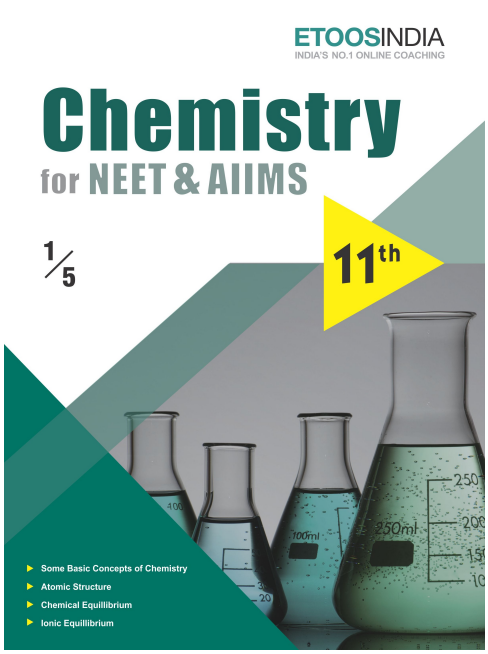
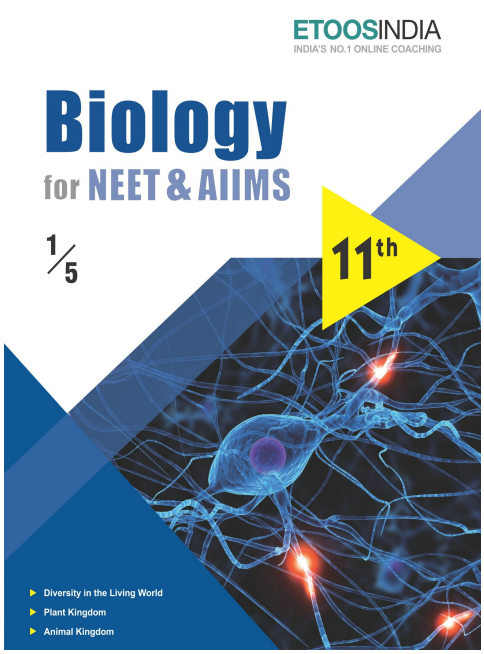
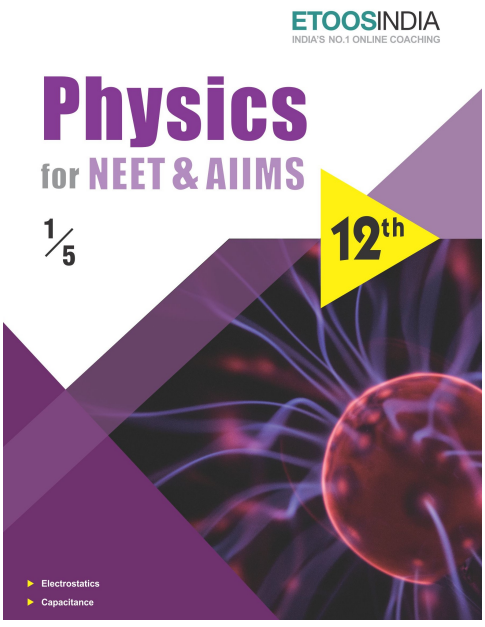
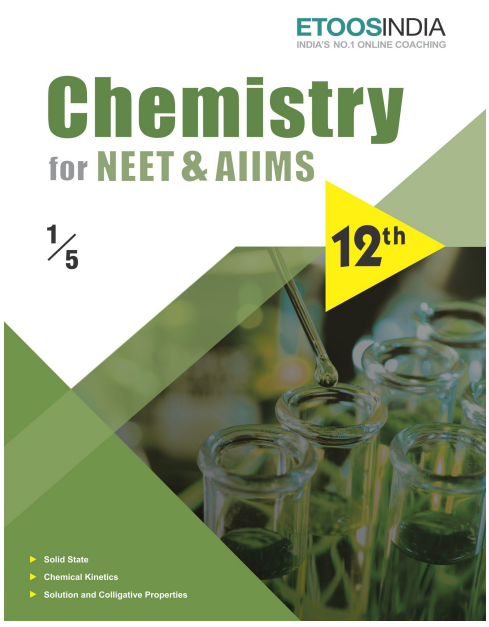
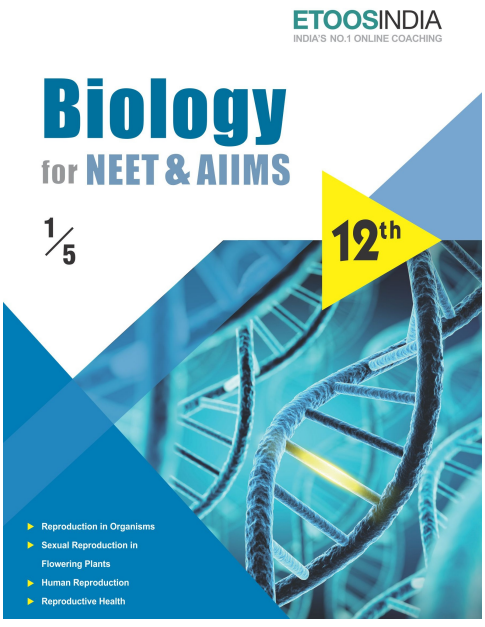












CHAPTER 16

ENVIRONMENTAL ISSUES

"The human mind adjusts itself to a certain point of view, and those who have regarded nature from one angle, during a portion of their life, can adopt new ideas only with difficulty."

"ANTOINE LAVOISIER (1743-1794)"

INTRODUCTION

Human population size has grown enormously over the last hundred years. This means increase in demand for food, water, home, electricity, roads, automobiles and numerous other commodities. These demands are exerting termendous pressure on our natural resouces, and are also contribuiting to pollution opf air, water and soil. The need of the hour is to check the degradation and depletion of our resources and pollution without halting the process of development.

Pollution is any desirable change in physical, chemical or biological characteristics of air, land , water or soil. Agebnts that brings about such an desirable change are called as pollutants. In order to control environmental pollution. The Government of India has passed the Environment (Protection) Act, 1986 to protect and improve the quality of our environment (air, water and soil).

Environmental Issues

Pollution :

"Any undesirable change in physical, chemical or biological characteristic of air, water and land which is harmful to the man directly or indirectly through the animals, plants industrial unit or raw materials is called **pollution**."

Pollutants : "Any material or product of man or nature which leads to pollution is called pollutants".

Type of Pollutat Usually Pollutants are Divided into Following Categories

1. **Nondegradable pollutants :** Many of such pollutants are usually not degraded or degraded partially in environment. Such as **aluminium packs, Mercury compounds of phenols, Glass, D.D.T., Benzene, BHC pesticides,** etc.

   They are collected in the environment and cause polluton. These pollutants are harmful even in low concentration and harm increases with their increasing concentration. No treatment is found in the nature for their recycling. There are only two methods by which we can stop the pollution caused by pollutant.

   (i) Such type of substance should be banned by law.

   (ii) Use their alternative substance.

2. **Biodegradable pollutants -** The **domestic sewage papers, woods, garbage, live stock wastes,** etc. are easily **degraded completely by microorganisms,** it becomes useful. But if these materials enter the environment in such large quantities, that they can not be degraded completely then addition of these materials cause pollution in environment.

   1. **Primary pollutants -** These perists in the form in which they are added to the environment.
      eg., DDT, CO etc.
   2. **Secondary pollutants -** These are formed by chemical reaction amongst primary pollutants.
      eg., **Photochemical smog, London smog, PAN, O3.**

   Synergism - Formation of secondary pollutants is known as synergism. Secondary pollutants are more toxic than primary pollutants.

1. **Quantitative pollutants -** These are the susbstance which occur in nature but become pollutant when their concentration reaches beyond a threshold value in the environment.
   eg., CO_2, Nitrogen oxide.
2. **Qualitative pollutants -** These are the substance which do not occur in the environment but are passed in through human activity.
   eg., Fungicides, Herbicides, DDT etc.

Other type of pollution :

1. **Natural pollution -** Caused by natural sources like, **CH4 from paddy fields** and **cattle, marsh, forest fire.**
2. **Anthropogenic pollution -** Caused by **human activities.**

   Main sources of pollution :

   (i) Point source pollution - Where the effluent discharge occur at a specific site.
   eg., Factory outlet and Municipal sewage

   (ii) Line source pollution - It is passed along a narrow belt, roads,
   eg., Rods, Railway tracks.

   (iii) Diffuse source pollution - It is over a large area.
   eg., sprayed fertilizer or pesticides through run off.

   (iv) Area source pollution - Industrial estate and mining area.

ETOOS KEY POINTS

Wildlife organisations

I.U.C.N.	=	The Intenational Union for Conservation of Nature and Natural Resources. (Switzerland)
W.W.F.	=	The World Wildlife Fund.
I.B.W.L.	=	India Board for Wildlife.
B.N.H.S.	=	The Bombay Natural History Society.
W.P.S.I.	=	The Wildlife Preservation Society of India.
C.P.C.B.	=	Central Pollution Control Board.
I.B.P.	=	International Biology Programme.
M.A.B.	=	Man and Biosphere Programme.
U.N.E.P.	=	United Nation Environment Programme.
N.M.N.H.	=	National Museum of Natural History.
U.N.D.P.	=	United Nations Development Programme.
B.R.P.	=	Biosphere Reserve Programme.
Z.S.I.	=	Zoological Survey of India.
B.S.I.	=	Botanical Survey of India.
C.A.Z.R.I.	=	Central Arid Zone Research Institute, Jodhpur.
C.I.T.E.S.	=	Convention and International Trade in Endangered Species of Wild Fauna and Flora. (1976)
F.R.I.	=	Forest Research Institute, Deharadun.
W.I.I.	=	Wild Life Institute of India, Dehradun.
U.N.E.S.C.O.	=	United Nations Educational Scientific and Cultural Organization.

28th February	-	Science Day
21st March	-	World Forest Day
22nd April	-	Earth Day
5th June	-	World Environment Day
7th July	-	Van Mahotsav Day
11th July	-	World Population Day
16th September	-	World Ozone Day
3rd October	-	World Animal Day
4th October	-	World Habitat Day
1st Week of October	-	Wild life week
2nd December	-	National Pollution prevention day or National environment day
3rd Decemebr	-	World Conservation Day
22th May	-	World Biodiversity Day

- **MIC Methyl Isocyanate]** was released in Bhopal gas tragedy on **3rd December 1984**. Which is used in the production of "Savin" insecticide in Union Carbide.
  - Tetraethyl lead and tetramethyl lead are formed by combustion of petroleum. They are known to hamper haemoglobin formation.
  - The disease produced by use of lead polluted water is called as **plumbism.**
  - Lead caused nervousness anaemia in human beings. It also damages kidney.

Etoos Tips & Formulas

- → In order to control environmental pollution, the government of India has passed the Environment (Protection) Act, 1986 to protect and improve the quality of our environment.
- → There are serveral ways of removing particulate matter; the most widely used of which is the electrostatic precipitator, which can remove over 99 percent particulate matter present in the exhaust from a thermal power plant.
- → A scrubber can remove gases like sulphur dioxide. In a scrubber the exhaust is passed through a spray of water or lime.
- → According to Central Pollution Control Board (CPCB). particulate size 2.5 micrometers or less in diameter (PM 2.5) are responsible for causing the greatest harm to human health.
- → Automobiles are a major cause for atmospheric pollution atleast in the metro cities.
- → Catalytic converters, having expensive metals namely platinum-palladium and rhodium as the catalysts, are fitted into automobiles for reducing emission of poisonous gases. As the exhaust passes through the catalytic converter, unburnt hydrocarbons are converted into carbon dioxide and water, and carbon monoxide and nitric oxide are changed to carbon dioxide and nitrogen gas respectively.
- → All the buses of Delhi were converted to run on CNG by the end of 2002.
- → Euro II norms, for example stipulates that sulphur be controlled at 350 parts per million (ppm) in diesel and 150 ppm in petrol. Aromatic hydrocarbons are to be contained at 42 percent of the concerned fuel. The goal, according to the roadmap. is to reduce sulphur to 50 ppm in petrol and diesel and bring down the level to 35 percent.
- → In India, the Air (Prevention and Control of Pollution) Act came into force in 1981, but was amended in 1987 to include noise as an air pollutant.
- → The Government of India has passed the Water (Prevention and Control of Pollution) Act 197 4 to safeguard our water resources.
- → A mere 0.1 percent impurities make domestic sewage unfit for human use .
- → Water hyacinth (Eichhornia crassipes), the world most problematic aquatic weed. also called 'Terror of Bangal' . They grow abundantly in eutrophic water bodies, and lead to an imbalance in the ecosystem dynamics of the water body.
- → Biomagnification: The concentration of DDT is increased at successive trophic levels; say if it starts at 0.003 ppb (ppb = parts per billion) in water, it can ultimately can reach 25 ppm (ppm = parts per million) in fish eating birds, through biomagnification.
- → Eutrophication is the natural aging of a lake by biological (nutrient) enrichment of its water.
- → The natural aging of a lake may span thousands of years. However, pollutants from man's activities like effluents from the industries and homes can radically accelerate the aging process. This phenomenon has been called Cultural or Accelerated Eutrophication.
- → Biologists from the Humboldt State University, the towns people created an integrated waste water treatment process within a natural system.
- → The biologists developed a series of six connected marshes over 60 hectares of marshland. Appropriate plants, algae, fungi and bacteria were seeded into this area, which neutralise absorb and assimilate the pollutants. Hence, as the water flow through the marshes, it gets purified naturally.
- → A citizens group called Friends of the Arcata Marsh (FOAM) are responsible for the upkeep and safeguarding of this wonderful project.

SOLVED EXAMPLE

Ex.1 Biochemical Oxygen Demand (BOD) in a river water
(A) Remains unchanged when algal bloom occurs
(B) Has no relationship with concentration of oxygen in the water
(C) Gives a measure of salmonella in the river water
(D) Increases when sewage gets mixed with river water

Sol. **(D)** : The degree of pollution is directly proportional to BOD, therefore more the organic pollution (specially sewage), the more would be BOD of water.

Ex.2 If global warming continues, the organism which may face more server threat is
(A) Cow **(B)** Banana
(C) Snow leopard **(D)** Dolphin

Sol. **(C)**

Ex.3 Cleaning Environment with biological options such as microbes & plants is called

Or

A process that uses micro-organisms to convert harmful industrial wastes to less toxic or non-toxic compounds is
(A) Bioremediation **(B)** Biotechnology
(C) Biowarware **(D)** Incineration

Sol. **(A)**

Ex.4 Ozone layer in upper atmosphere (stratosphere) is destroyed by or which one of thechemicals is resposible for the reduction of ozone content of atmosphere

Or

What are the chief pollutants of the atmosphere which are most likely to deplete the ozone layer
(A) Hydrochloric acid
(B) Photochemical smog
(C) Chlorofluoro carbon (CFC) and Nitrogen oxide
(D) Sulphur dioxide

Sol. **(C)** : CFC is strong enemy of ozone and causes depletion of ozone layer.

Ex.5 In 1984, Bhopal gas tragedy was caused due to leakage of
(A) Sodium monoxide **(B)** Sodium thiocyanate
(C) Potassium isocyanate **(D)** Methyl isocyanate

Sol. **(D)**

Ex.6 Which one of the following pairs is mismatched
(A) Fossil fuel burning - release of CO_2
(B) Nuclear power - radioactive wastes
(C) Solar energy - greenhouse effect
(D) Biomass burning - release of CO_2

Sol. **(C)** : Solar energy is not responsible for green house effect instead it is a source of energy for the plants and animals.

Ex.7 According to the Central Pollution Control Board, the diameter of particles thatare responsible for causing great harm to human health is
(A) 2.5 micrometer **(B)** 5.0 micrometer
(C) 10.0 micrometer **(D)** 7.5 micrometer

Sol. **(A)**

Ex.8 Which of the following exhinits biomagnification
(A) SO_2 **(B)** Mercury
(C) DDT **(D)** Both **(B)** and **(C)**

Sol. **(D)**

Ex.9 Match the following and choose the correct option

Column - I	Column - II
(i) Environment Protection Act	**(A)** 1974
(ii) Air Prevention & Control of Pollution Act	**(B)** 1987
(iii) water Act	**(C)** 1986
(iv) Amendment of Air Act to include noise as an air pollutant	**(D)** 1981

The correct matches is
(A) i - C, ii - D, iii - A, iv - B
(B) i - A, ii - C, iii - B, iv - D
(C) i - D, ii - A, iii - B, iv - C
(D) i - C, ii - D, iii - B, iv - A

Sol. **(A)**

Ex.10 Which one of the following diseases is not caused due to contamination of water
(A) Hepatitis-B **(B)** Jaundice
(C) Cholera **(D)** Typhoid

Sol. **(A)**

Exercise # 1 SINGLE OBJECTIVE NEET LEVEL

1. The excessive discharge of fertilizers into water bodies results in
(A) Growth of fish
(B) Death of hydrophytes
(C) Eutrophication
(D) Silt

2. Ozone layer in upper atmosphere (stratosphere) is destroyed by or which one of the chemicals is responsible for the reduction of ozone content of atmosphere
(A) Hydrochloric acid
(B) Photochemical smog
(C) Chlorofluoro carbon (CFC)
(D) Sulphur dioxide

3. What are the chief pollutants of the atmosphere which are most likely to deplete the ozone layer
(A) Sulphur dioxide
(B) Nitrogen oxide and fluorocarbons
(C) Carbon dioxide
(D) Carbon monoxide

4. The pollutants emitted by jet aeroplanes in outer atmosphere flourocarbons are known as
(A) Smog
(B) Photochemical oxidants
(C) Aerosols (D) Loess

5. Acid rain is caused due to increase in concentration of (in atmosphere)
(A) SO_2 and NO_2 (B) CO and CO_2
(C) CO and SO_3 (D) O_3 and dust

6. Today the concentration of green house gases is very high because of
(A) Use of refrigerator
(B) Increased combustion of oils and coal
(C) Deforestation
(D) All of the above

7. Increase in the percentage of fauna and decrease in flora may be dangerous because it enhances
(A) Percentage of CO_2
(B) Percentage of radioactive fall out
(C) Percentage of O_2
(D) Persentage of diseases

8. The pollution in city like Delhi may be controlled to great extent
(A) By proper sewage and proper exit of chemicals from factories
(B) By wide roads and factories away from the city
(C) By cleaning city and scanty use of pesticides
(D) All of the above

9. Domestic waste contains
(A) Non-biodegradable pollutants
(B) Biodegradable pollutants
(C) Hydrocarbons
(D) None of the above

10. Foul smell in the water of tanks, ponds etc. is due to
(A) Anaerobiosis
(B) Aerobiosis
(C) Biological magnification
(D) Psammophytes

11. Measurement of the rate of O_2 consumption in unit volume of water over a period of time is done to find out
(A) Biogas generation
(B) Biological oxygen demand
(C) Biosynthetic pathways
(D) Fermentation

12. Formation of ozone hole is maximum over
(A) India (B) Antarctica
(C) Europe (D) Africa

13. Which one of the following organisms is used as indicator of water quality
(A) Biggiata (B) Chlorella
(C) Azospirillum (D) Escherichia

14. Which of the following serves as an indicator of atmospheric pollution
(A) Ferns (B) Liverworts
(C) Hornworts (D) Epiphytic lichens

15. Lead (Pb) causes
(A) Soil pollution (B) Air pollution
(C) Radioactive pollution (D) All the above

16. The stratospheric ozone depletion leads to
(A) Global warming
(B) Increase in the incidence of skin cancers
(C) Forest fires
(D) All the above

Exercise # 2

SINGLE OBJECTIVE | AIIMS LEVEL

1. Green house effect refers to
(A) Cooling of earth (B) Trapping of UV rays
(C) Production of cereals (D) Warming of earth

2. Which of the following is pollution related disorder
(A) Hypertension (B) Leprosis
(C) Silicosis (D) Pneumonicosis

3. Which of the following organism is likely to have more concentration of D.D.T in its body
(A) Herbivores (B) Carnivores
(C) Top carnivores (D) Primary producers

4. Increasing of temperature due to scattering of energy is determine by ozone, and water vapour, is known as
(A) Radioactivity (B) Ozone effect
(C) Solar reaction (D) Green house effect

5. Water pollution is caused due to
(A) Sewage and other wastes
(B) Industrial effluents
(C) Agricultural discharges
(D) All of these

6. Which among the following is likely to have the highest levels of D.D.T. depositions in its body
(A) Eel (B) Crab
(C) Sea gull (D) Phytoplankton

7. The ultimate environmental hazard to mankind is
(A) Air pollution (B) Water pollution
(C) Noise pollution (D) Nuclear pollution

8. Aerosols reduce primary productivity by
(A) Destroying leaf tissue (B) Premature leaf fall
(C) Reducing crop yields (D) All of these

9. Water pollution is caused by
(A) Ammonia (B) Phytoplankton
(C) Industrial effluents (D) Smoke

10. The most adverse effect of radioactive pollutant is
(A) Gene mutation (B) Hepatitis
(C) Polio (D) T.B.

11. The result of ozone hole is
(A) Acid rain (B) UV radiations
(C) Global warming (D) Green house effect

12. Increase in the concentration of pollutants in higher trophic levels is called
(A) Recycling (B) Eutrophication
(C) Biodegradation (D) Biomagnification

13. What is the intensity of sound in normal conversation
(A) 10-20 dB (B) 40-60 dB
(C) 90-120 dB (D) 120-150 dB

14. Which of the following is most poisonous
(A) CO (B) CO_2
(C) C (D) SO_2

15. The high amount of E. coli in water is the indicator of
(A) Hardness of water (B) Industrial pollution
(C) Sewage pollution
(D) Presence of chlorine in water

16. Which is a degradable pollutant
(A) D.D.T. (B) Aluminium foil
(C) Domestic wastes (D) Mercury salts

17. Which is a green house gas
(A) CO (B) CO_2
(C) H_2 (D) N_2

18. Which of the following is biodegradable pollutant
(A) Sewage (B) Plastic
(C) Polythene (D) DDT

19. Effect of pollution first marked on
(A) Micro-organisms
(B) Green vegetation of an area
(C) Food crop (D) None of these

20. Green muffler is used against which type of pollution
(A) Air (B) Water
(C) Soil (D) Noise

21. Positive pollution of soil is due to
(A) Excessive use of fertilizers
(B) Addition of wastes on soil
(C) Reduction in soil productivity
(D) All of these

22. CO is more toxic than CO_2 because
(A) It affects the nervous system
(B) It damages lungs
(C) It reduces the oxygen carrying capacity of hemoglobin
(D) It forms acid with water

Exercise # 3 PART - 1 MATRIX MATCH COLUMN

1. Match the following items in column I with column II and choose the correct answer

Column - I	Column - II
(A) Arsenic	(1) Minamata disease
(B) Nitrate	(2) Itai-Itai
(C) Mercury	(3) Blue-baby syndrome
(D) Cadmium	(4) Skeletal fluorosis
(E) Fluoride	(5) Black-foot disease

(A) A-2, B-3, C-5, D-1, E-4 (B) A-5, B-3, C-1, D-2, E-4
(C) A-3, B-4, C-5, D-1, E-2 (D) A-5, B-4, C-3, D-2, E-1
(E) A-2, B-5, C-4, D-3, E-1

2. Match the following and choose the correct combination from the option given below

Column - I Green house gases)	Column - II (Concentration in 2000 AD)
(A) CO_2	(1) 282 ppt
(B) CH_4	(2) 316 ppb
(C) N_2O	(3) 368 ppm
(D) CFC + HFC	(4) 1750 ppb

(A) (A) - (3), (B) - (4), (C) - (2), (D) - (1) (B) (A) - (4), (B) - (3), (C) - (2), (D) - (1)
(C) (A) - (2), (B) - (3), (C) - (4), (D) - (1) (D) (A) - (1), (B) - (4), (C) - (2), (D) - (3)
(E) (A) - (1), (B) - (2), (C) - (3), (D) - (4)

3. Match the following and choose the correct combinations from the options given

Column - I	Column - II
(A) DDT	(p) CO, CO_2
(B) PAN	(q) Smog
(C) Acid rain	(r) Biological magnification
(D) Global warming	(s) SO_2

(A) (a)-(s), (b)-(r), (c)-(q), (d)-(p) (B) (a)-(p), (b)-(r), (c)-(q), (d)-(s)
(C) (a)-(q), (b)-(r), (c)-(s), (d)-(p) (D) (a)-(r), (b)-(q), (c)-(s), (d)-(p)
(E) (a)-(r), (b)-(s), (c)-(p), (d)-(q)

4. Match the following and choose the correct option:

Column - I	Column - II
(i) Environment Protection Act	(A) 1974
(ii) Air Prevention & Control of Pollution Act	(B) 1987
(iii) Water Act	(C) 1986
(iv) Amendment of Air Act to include noise as an air pollutant	(D) 1981

The correct matches is
(A) i-C, ii-D, iii-A, iv-B (B) i-A, ii-C, iii-B, iv-D
(C) i-D, ii-A, iii-B, iv-C (D) i-C, ii-D, iii-B, iv-A

Exercise # 4

PART - 1 | PREVIOUS YEAR (NEET/AIPMT)

1. Relative Biological Effectiveness (RBE) refers to the damages caused by
(A) low temperature (B) high temperature
(C) radiation (D) pollution

2. What is the intensity of sound in normal conversation?
(A) 0-20 dB (B) 30-60 dB
(C) 70-90 dB (D) 120-150 dB

3. What is BOD?
(A) The amount of O_2 utilised by organisms in water
(B) The amount of O_2 utilised by microorganisms for decomposition
(C) The total amount of O_2 present in water
(D) All of the above

4. Which of the following is absent in polluted water?
(A) Hydrilla (B) Water hyacinth
(C) Larva of stone fly (D) Blue-green algae

5. Fluoride pollution mainly affects
(A) teeth (B) kidney
(C) brain (D) heart

6. If by radiation all nitrogenase enzymes are inactivated, then there will be no
(A) Fixation of nitrogen in legumes
(B) Fixation of atmospheric nitrogen
(C) Conversion from nitrate to nitrite in legumes
(D) Conversion from ammonium to nitrate in soil

7. In 1984, the Bhopal gas tragedy took place because methyl isocyanate
(A) reacted with DOT
(B) reacted with ammonia
(C) reacted with CO_2
(D) reacted with water

8. Identify the correctly matched pair.
(A) Montreal protocol - Global warming
(B) Kyoto protocol - Climate change
(C) Ramsar convention - Ground water pollution
(D) Basal convention - Biodiversity conservation

9. Lead concentration in blood is considered alarming if it is
(A) 20 ng/100 ml (B) 30 p.g/100 ml
(C) 4-6 ng/100 ml (D) 10 ng/100 ml

10. Recently Govt. of India has allowed mixing of alcohol in petrol. What is the amount of alcohol permitted for mixing in petrol?
(A) 2.5% (B) 10-15%
(C) 10% (D) 5%

11. Which of the following is not used for disinfection of drinking water?
(A) Phenyl (B) Chloramine
(C) Chlorine (D) Ozone

12. Which one of the following pair is mismatched?
(A) Biomass burning - Release of CO_2
(B) Fossil fuel burning - Release of CO_2
(C) Nuclear power - Radioactive wastes
(D) Solar energy - Greenhouse effect

13. Limit of BOD prescribed by Central Pollution Control Board for the discharge of industrial and municipal waste water into natural surface water, is
(A) < 3.0 ppm (B) < 10 ppm
(C) < 100 ppm (D) < 30 ppm

14. Montreal protocol, which calls for appropriate action to protect the ozone layer from human activities was passed in the year
(A) 1986 (B)1987
(C) 1988 (D) 1985

15. Photochemical smog pollution does not contain
(A) ozone
(B) nitrogen dioxide
(C) carbon dioxide
(D) PAN (Peroxy Acyl Nitrate)

16. In which one of the following, the BOD (Biochemical Oxygen Demand) of sewage (S), distillery effluent (DE), paper mill effluent (PE) and sugar mill effluent (SE) have been arranged in ascending order?
(A) SE < S < PE < DE (B) SE < PE < S < DE
(C) PE < S < SE < DE (D) S < DE < PE < SE

17. In a coal fired power plant, electrostatic precipitators are installed to control emission of
(A) SO_2 (B) NO_2
(C) SPM (D) CO

18. Which one of the following is not a bioindicator of water pollution?
(A) Sludge worms (B) Blood worms
(C) Stone flies (D) Sewage fungus

MOCK TEST

1. A scrubber in the exhaust of a chemical industry removes
(A) Nitrous oxide (B) Hydrogen sulphide (C) Carbon dioxide (D) Sulphur dioxide

2. Effect of pollution is observed first on
(A) Micro-organisms (B) Food crop (C) Green vegetation (D) Herbivores

3. Match column I with column II

Column - I	Column - II
(P) Pollen grains	(i) Photochemical smog
(Q) PAN	(ii) Particulate pollution
(R) CO_2	(iii) Global warming
(S) Cadmium	(iv) Itai itai disease

(A) P - (ii) , Q - (i), R - (iii), S - (iv) (B) P - (iv) , Q - (ii), R - (i), S - (iii)
(C) P - (i) , Q - (ii), R - (iii), S - (iv) (D) P - (iii) , Q - (i), R - (ii), S - (iv)

4. Consider the following statements with respect to pollution.
(A) To control air pollution problems, by the end of 2002 all the buses of Delhi were converted to run on unleaded petrol.
(B) Electrostatic precipitator can remove over 99% particulated matter present in the exhaust from a thermal power plant.
(C) It is possible to estimate the amount of organic matter in sewage water by measuring BOD.
(A) A alone is correct (B) B alone is correct (C) C alone is correct (D) A and B are correct
(E) B and C are correct

5. Match the items of column I with column II and select the correct option.

Column - I	Column - II
(A) Electrostatic	(1) Removes gases like SO_2
(B) Scrubber	(2) Reduces automobile emission
(C) Catalytic converter	(3) Removes particulate matter

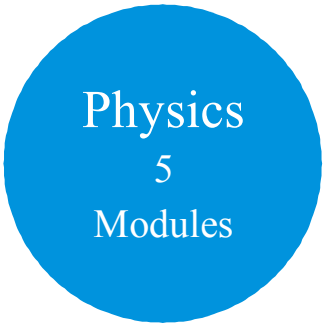
(A) A - 2 , B - 3, C - 1 (B) A - 3 , B - 2, C - 1 (C) A - 1 , B - 2, C - 3 (D) A – 3, B – 1, C–2
(E) A–1, B–3, C–2

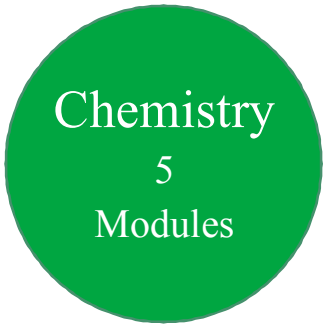
6. 'Floc' is .....
(A) A mesh-like structure formed by the association of bacteria and fungal filaments in sewage treatment
(B) The primary sludge produced in sewage treatment
(C) The effulent in primary treatment tank obtained during sewage treatment
(D) A type of biofortified food

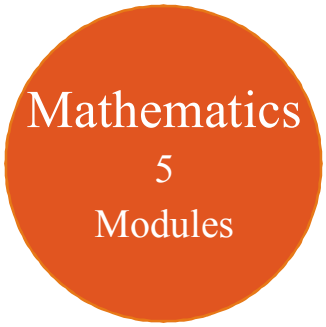
7. Biochemical Oxygen Demand (BOD) may not be a good index for pollution for water bodies receiving effluents from
(A) Domestic sewage (B) Dairy industry (C) Petroleum industry (D) Sugar industry

8. Find the correct order of biomagnification of DDT in an aquatic food chain
(A) Water (0.003 ppm), zooplankton (0.5 ppm), small fish (0.04 ppm), large fish (2 ppm), fish eating birds (25 ppm)
(B) Water (0.003 ppm), zooplankton (0.04 ppm), small fish (0.5 ppm), large fish (2 ppm), fish eating birds (25 ppm)
(C) Water (0.003 ppm), fish eating birds (25 ppm), zooplankton (0.5 ppm), small fish (0.04 ppm), large fish (2 ppm)
(D) Water (0.003 ppm), small fish (0.04 ppm), zooplankton (0.5 ppm), large fish (2 ppm), fish eating birds (25 ppm)
(E) Water (0.003 ppm), large fish (0.04 ppm), small fish (0.5 ppm), zooplankton (2 ppm), fish eating birds (25 ppm)

11th Class Modules Chapter Details

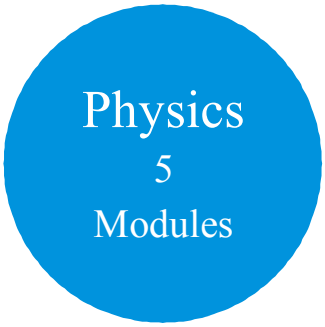


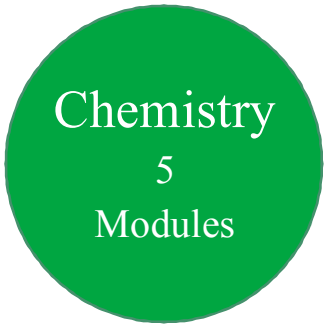


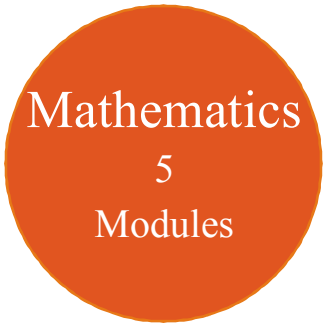


PHYSICS	CHEMISTRY	BIOLOGY
Module-1 1. Physical World & Measurements 2. Basic Maths & Vector 3. Kinematics **Module-2** 1. Law of Motion & Friction 2. Work, Energy & Power **Module-3** 1. Motion of system of particles & Rigid Body 2. Gravitation **Module-4** 1. Mechanical Properties of Matter 2. Thermal Properties of Matter **Module-5** 1. Oscillations 2. Waves	**Module-1(PC)** 1. Some Basic Conceps of Chemistry 2. Atomic Structure 3. Chemical Equilibrium 4. Ionic Equilibrium **Module-2(PC)** 1. Thermodynamics & Thermochemistry 2. Redox Reaction 3. States Of Matter (Gaseous & Liquid) **Module-3(IC)** 1. Periodic Table 2. Chemical Bonding 3. Hydrogen & Its Compounds 4. S-Block **Module-4(OC)** 1. Nomenclature of Organic Compounds 2. Isomerism 3. General Organic Chemistry **Module-5(OC)** 1. Reaction Mechanism 2. Hydrocarbon 3. Aromatic Hydrocarbon 4. Environmental Chemistry & Analysis Of Organic Compounds	**Module-1** 1. Diversity in the Living World 2. Plant Kingdom 3. Animal Kingdom **Module-2** 1. Morphology in Flowering Plants 2. Anatomy of Flowering Plants 3. Structural Organization in Animals **Module-3** 1. Cell: The Unit of Life 2. Biomolecules 3. Cell Cycle & Cell Division 4. Transport in Plants 5. Mineral Nutrition **Module-4** 1. Photosynthesis in Higher Plants 2. Respiration in Plants 3. Plant Growth and Development 4. Digestion & Absorption 5. Breathing & Exchange of Gases **Module-5** 1. Body Fluids & Its Circulation 2. Excretory Products & Their Elimination 3. Locomotion & Its Movement 4. Neural Control & Coordination 5. Chemical Coordination and Integration

12th Class Modules Chapter Details







PHYSICS

Module-1

1. Electrostatics
2. Capacitance

Module-2

1. Current Electricity
2. Magnetic Effect of Current and Magnetism

Module-3

1. Electromagnetic Induction
2. Alternating Current

Module-4

1. Geometrical Optics
2. Wave Optics

Module-5

1. Modern Physics
2. Nuclear Physics
3. Solids & Semiconductor Devices
4. Electromagnetic Waves

CHEMISTRY

Module-1(PC)

1. Solid State
2. Chemical Kinetics
3. Solutions and Colligative Properties

Module-2(PC)

1. Electrochemistry
2. Surface Chemistry

Module-3(IC)

1. P-Block Elements
2. Transition Elements (d & f block)
3. Co-ordination Compound
4. Metallurgy

Module-4(OC)

1. HaloAlkanes & HaloArenes
2. Alcohol, Phenol & Ether
3. Aldehyde, Ketone & Carboxylic Acid

Module-5(OC)

1. Nitrogen & Its Derivatives
2. Biomolecules & Polymers
3. Chemistry in Everyday Life

BIOLOGY

Module-1

1. Reproduction in Organisms
2. Sexual Reproduction in Flowering Plants
3. Human Reproduction
4. Reproductive Health

Module-2

1. Principles of Inheritance and Variation
2. Molecular Basis of Inheritance
3. Evolution

Module-3

1. Human Health and Disease
2. Strategies for Enhancement in Food Production
3. Microbes in Human Welfare

Module-4

1. Biotechnology: Principles and Processes
2. Biotechnology and Its Applications
3. Organisms and Populations

Module-5

1. Ecosystem
2. Biodiversity and Conservation
3. Environmental Issues