16. Environmental Chemistry– Multiple Choice Questions

1. Air Pollution

1. Which of the following strategy is not a correct approach to reduce global warming

(a) Reducing the green house gas emission by limiting the use of fossil fuels

(b) Increase the vegetation cover particularly the forest for photosynthetic utilization of CO_2

(c) Minimizing the use of nitrogen fertilizers in agriculture for reducing N_2O emission

(d) Increasing the use of air conditioners, refrigeration unit and production of plastic foams and propellants in aerosol spray cans

(e) Developing substitutes for chlorofluorocarbons

2. It is said, the Taj Mahal may be destroyed due to

(a) Flood in Yamuna river

(b) Decomposition of marble as a result of high temperature

(c) Air pollutants released from oil refinery of Mathura

(d) All the above

3. Carbon monoxide (CO) is harmful to man because

(a) It forms carbolic acid

(b) It generates excess CO_2

(c) It is carcinogenic

(d) It competes with O_2 for haemoglobin

4. 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

5. The pollutants emitted by jet aeroplanes in outer atmosphere are known as

(a) Smog (b) Photochemical oxidants

(c) Aerosols (d) Loess

6. Which of the following group of gases cause photochemical smog

(a) O_3, PAN and CO (b) HC, NO and PAN

(c) O_2, PAN and NO_2 (d) O_2, PAN and NO_3

(e) O_3, PAN and NO_2

7. Most harmful pollutant is

(a) CO_2 (b) SO_3

(c) NO_2 (d) CH_4

(e) SO_2

8. Most hazardous metal pollutant of automobile exhaust is

(a) Mercury (b) Lead

(c) Cadmium (d) Copper

9. This pollutant causes burning sensation of throat and eyes and vomiting sensation

(a) Hydrogen sulphide (b) Sulphur

(c) Hydrogen cyanide (d) Arsenic substances

10. Which of the following is most poisonous

(a) CO (b) CO_2

(c) C (d) SO_2

11. In almost all Indian metropolitan cities like Delhi, the major atmospheric pollutant(s) is/ are

(a) Suspended particulate matter (SPM)

(b) Oxides of sulphur

(c) Carbon dioxide and carbon monoxide

(d) Oxides of nitrogen

12. How carbon monoxide, emitted by automobiles, prevents transport of oxygen in the body tissues

(a) By changing oxygen into carbon dioxide

(b) By destroying the haemoglobin

(c) By forming a stable compound with haemoglobin

(d) By obstructing the reaction of oxygen with haemoglobin

13. Metal generally present in polluted air is

(a) Cadmium (b) Lead

(c) Mercury (d) Zinc

14. Which one of the following is not a device used to control a particulate matter

(a) Arresters (b) Scrubbers

(c) Filters (d) Electrostatic precipitator

(e) Incinerator

15. Which of the following statements is not true about classical smog

(a) Its main components are produced by the action of sunlight on emissions of automobiles and factories

(b) Produced in cold and humid climate

(c) It contains compounds of reducing nature

(d) It contains smoke, fog and sulphur dioxide

16. Dinitrogen and dioxygen are main constituents of air but these do not react with each other to form oxides of nitrogen because.....

(a) The reaction is endothermic and requires very high temperature

(b) The reaction can be initiated only in presence of a catalyst

(c) Oxides of nitrogen are unstable

(d) N_2 and O_2 are unreactive

17. The pollutants which come directly in the air from sources are called primary pollutants. Primary pollutants are sometimes converted into secondary pollutants. Which of the following belongs to secondary air pollutants

(a) CO (b) Hydrocarbon

(c) Peroxyacetyl nitrate (d) NO

18. The chemical entities present in thermosphere of the atmosphere are

(a) O_2^+, O^+, NO^+ (b) O_3

(c) N_2, O_2, CO_2, H_2O (d) O_3, O_2^+, O_2

19. In a coal fired power plant electrostatic precipitators are installed to control emission of

(a) SO_2 (b) NO_x

(c) SPM (d) CO

20. Acid rain is caused by or recent reports of acid rain in some industrial cities are due to the effect of atmospheric pollution by

(a) Excessive release of CO_2 by burning of fuels like wood and charcoal, cutting of forests and increased animal population

(b) Excessive release of NO_2 and SO_2 in atmosphere by burning of fossil fuel

(c) Excessive release of NH_3 by industrial plants and coal gas

(d) Excessive release of CO in atmosphere by incomplete combustion of coke, charcoal and other carbonaceous fuel in paucity of oxygen

21. 70% component of acid rain is

(a) HNO_3 (b) H_2SO_4

(c) HCl (d) CO_2

22. Which of the following gases is not a green house gas

(a) CO (b) O_3

(c) CH_4 (d) H_2O vapour

23. Photochemical smog occurs in warm, dry and sunny climate. One of the following is not amongst the components of photochemical smog, identify it

(a) NO_2 (b) O_3

(c) SO_2 (d) Unsaturated hydrocarbon

24. Which of the following statement (s) is/are wrong

(a) Ozone is not responsible for green house effect

(b) Ozone can oxidies sulphur dioxide present in the atmosphere to sulphur trioxide

(c) Ozone hole is thinning of ozone layer present in stratosphere

(d) Ozone is produced in upper stratosphere by the action of UV rays on oxygen

25. The gaseous envelope around the earth is known as atmosphere. The lowest layer of this is extended upto 10 *km* from sea level, this layer is

(a) Stratosphere (b) Troposphere

(c) Mesosphere (d) Hydrosphere

2. Water Pollution

1. Brewery and sugar factory waste alters the quality of a water body by increasing

(a) Temperature (b) Turbidity

(c) *pH* (d) COD and BOD

2. When huge amount of sewage is dumped into a river, the BOD will

(a) Increase (b) Remain unchanged

(c) Slightly decrease (d) Decrease

3. A dental disease characterised by mottling of teeth is due to presence of a certain chemical element in drinking water. Which is that element

(a) Boron (b) Chlorine

(c) Fluorine (d) Mercury

4. 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

5. Biological Oxygen Demand (BOD) is a measure of

(a) Industrial wastes poured into water bodies

(b) Extent to which water is polluted with organic compounds

(c) Amount of carbon monoxide inseparably combined with haemoglobin

(d) Amount of oxygen needed by green plants during night

6. Black-foot disease is caused due to groundwater contaminated with excess of

(a) Nitrate (b) Fluoride

(c) Arsenic (d) Sulphur

(e) Mercury

7. B.O.D. is connected with

(a) Organic matter (b) Microbes

(c) Both (a) and (b) (d) None of these

8. Minimata disease first occurred in

(a) Japan (b) China

(c) Korea (d) Russia

9. Sewage containing organic waste should not be disposed in water bodies because it causes major water pollution. Fishes in such a polluted water die because of

(a) Large number of mosquitoes

(b) Increase in the amount of dissolved oxygen

(c) Decrease in the amount of dissolved oxygen in water

(d) Clogging of gills by mud

10. The process of 'eutrophication' is due to

(a) Increase in concentration of insecticide in water

(b) Increase in concentration of fluoride ion in water

(c) The reduction in concentration of the dissolved oxygen in water due to phosphate pollution in water

(d) Attack of younger leaves of a plant by peroxyacetyl nitrate

(e) Increase in concentration of radioactive substances in water

11. Excess nitrate in drinking water can cause

(a) Methemoglobinemia (b) Kidney damage

(c) Liver damage (d) Laxative effect

(e) Leucoderma

12. Minamata disease was caused due to the consumption of

(a) Sea food containing lot of cadmium

(b) Fish contaminated with mercury

(c) Oysters with lot of pesticide

(d) Sea food contaminated with selenium

13. Which of the following metal is a water pollutant and causes sterility in human being

(a) *As* (b) *Mn*

(c) *Mg* (d) *Hg*

14. Eutrophication is caused by

(a) Acid rain

(b) Nitrates and phosphates

(c) Sulphates and carbonates

(d) CO_2 and CO

15. Which of the following damages WBC, bone–marrows and lymph nodes

(a) I^{131} (b) Ca^{40}

(c) Caesium (d) Sr^{90}

16. Excessive accumulation of organic matter in water bodies leads to

(a) Decrease in species diversity

(b) Increase in species diversity

(c) Green house effect

(d) No effect on species diversity

17. Biochemical Oxygen Demand, (*BOD*) is a measure of organic material present in water. *BOD* value less than 5 *ppm* indicates a water sample to be

(a) Rich in dissolved oxygen

(b) Poor in dissolved oxygen

(c) Highly polluted

(d) Not suitable for aquatic life

3. Different Types of Pollution and Pollutants

1. The most adverse effect of radioactive pollutant is

(a) Gene mutation (b) Hepatitis

(c) Polio (d) T.B.

2. U^{238} emits

(a) *Gamma*–rays (b) *Beta*–rays

(c) *Alpha*–rays (d) None of these

3. Most important causative pollutant of soil may be

(a) Plastics (b) Iron junks

(c) Detergents (d) Glass junks

4. Permissible noise levels in a residential area at night time is

(a) 35 db (b) 40 db

(c) 45 db (d) 50 db

5. Which of the following causes outbreak of jaundice

(a) Air pollution (b) Water pollution

(c) Thermal pollution (d) Soil pollution

6. Which of the following does not cause pollution

(a) Hydroelectric schemes (b) Automobiles

(c) Nuclear energy project (d) Thermal power project

7. Which of the following practices will not come under green chemistry

(a) If possible, making use of soap made of vegetable oils instead of using synthetic detergents

(b) Using H_2O_2 for bleaching purpose instead of using chlorine based bleaching agents

(c) Using bicycle for travelling small distances instead of using petrol/diesel based vehicles

(d) Using plastic cans for neatly storing substances

8. 'Heat islands' are produced due to

(a) Air pollution (b) Water pollution

(c) Land pollution (d) All of the above

9. Green muffler is used against which type of pollution

(a) Air (b) Water

(c) Soil (d) Noise

10. The term "Bio-magnification" refers to the

(a) Growth of organism due to food consumption

(b) Increase in population size

(c) Blowing up of environmental issues by man

(d) Increase in the concentration of non-degradable pollutants as they pass through food chain

(e) Decrease in population size

11. Which of the following is the use of lichens in case of pollution

(a) They treat the polluted water

(b) They act as bioindicators of pollutions

(c) They promote pollution

(d) Lichens are not related with pollution

12. Bio-indicators are used for

(a) Oxygen demand (b) Air pollution

(c) Mineral present (d) All of these

13. Which one of the following statements pertaining to pollutants is correct

(a) DDT is non-biodegradable pollutant

(b) Excess fluoride in drinking water causes ostoporosis

(c) Excess cadmium in drinking water causes black foot disease

(d) Methyl mercury in water may causes "Itai-Itai disease"

14. Which of the following pollutants affect more to organisms of the higher trophic level of a food chain due to biological amplification

(a) Sewage and plant fertilizers

(b) Detergents

(c) Heavy metals mercury salts and non- biodegradable phenolic chemicals

(d) Poisonous cyanides

15. Exposure of an organism to UV system causes

(a) Photodynamic action

(b) Formation of thymidine

(c) Splitting of *H*–bonds of DNA

(d) Splitting of phosphodiester bonds

4. IIT-JEE/ AIEEE

1. In 1984, Bhopal gas tragedy was caused due to leakage of **[2013]**

(a) Sodium monoxide (b) Sodium thiocyanate

(c) Potassium isocyanate (d) Methyl isocyanate

2. Identify the ***wrong*** statement in the following **[2008]**

(a) Greenhouse effect is responsible for global warming

(b) Ozone layer does not permit infrared radiation from the sun to reach on the earth

(c) Acid rain is mostly because of oxides of nitrogen and sulphur

(d) Chlorofluorocarbons are responsible for ozone layer depletion

3. Frequent occurrence of water blooms in a lake indicates **[2003]**

(a) Nutrient deficiency

(b) Oxygen deficiency

(c) Excessive nutrient availability

(d) Absence of herbivores in the lake

4. A water sample has *ppm* level concentration of following anions

$F^- = 10;\ SO_4^{2-} = 100;\ NO_3^- = 50$

The anion/anions that make/makes the water sample unsuitable for drinking is/are **[2017]**

(a) Both SO_4^{2-} and NO_3^-

(b) Only F^-

(c) Only SO_4^{2-}

(d) Only NO_3^-

5. What is DDT among the following [2012]

(a) Greenhouse gas

(b) A fertilizer

(c) Biodegradable pollutant

(d) Non-biodegradable pollutant

5. NEET/ AIPMT/ CBSE-PMT

1. Major aerosol pollutant present in the jet plane emission is [1990]

(a) Sulphur dioxide (b) Fluorocarbon

(c) Carbon tetrachloride (d) Carbon monoxide

2. Which one of the following statements regarding photochemical smog is not correct [2012]

(a) Carbon monoxide does not play any role in photochemical smog formation

(b) Photochemical smog is an oxidizing agent in character

(c) Photochemical smog is formed through photochemical reaction involving solar energy

(d) Photochemical smog does not cause irritation in eyes and throat

3. Which one of the following is not a common component of Photochemical Smog [2014]

(a) Peroxyacetyl nitrate (b) Chlorofluorocarbons

(c) Ozone (d) Acrolein

4. Green house effect is caused by [2002, 05]

(a) Green plants (b) Infra red rays

(c) UV rays (d) X rays

5. Which of the following is a sink for *CO* [2017]

(a) Haemoglobin

(b) Micro organisms present in the soil

(c) Oceans

(d) Plants

6. Which one of the following is not used for disinfection of drinking water

(a) Chlorine (b) Ozone

(c) Chloramine (d) Phenyl

7. Which one of the following statement is not true [2011]

(a) Oxides of sulphur, nitrogen and carbon are the most widespread air pollutant

(b) *pH* of drinking water should be between 5.5 – 9.5

(c) Concentration of *DO* below 6 *ppm* is good for the growth of fish

(d) Clean water would have a *BOD* value of less than 5 *ppm*

6. Assertion and Reason

Read the assertion and reason carefully to mark the correct option out of the options given below :

(a) If both the assertion and the reason are true and the reason is a correct explanation of the assertion

(b) If both the assertion and reason are true but the reason is not a correct explanation of the assertion

(c) If the assertion is true but the reason is false

(d) If both the assertion and reason are false

(e) If the assertion is false but reason is true

1. Assertion : Methylmercury is a highly persistent kind of pollutant that accumulates in food chains.
   Reason : Mercury pollution is responsible for Minamata disease.

2. Assertion : Water pollutants are measured by BOD.
   Reason : If BOD is more, the water is polluted.

3. Assertion : Suspended particulate matter (SPM) is an important pollutant released by diesel vehicles.
   Reason : Catalytic converters greatly reduce pollution caused by automobiles.

4. Assertion : The *pH* of acid rain is less than 5.6.
   Reason : Carbon dioxide present in the atmosphere dissolves in rain water and forms carbonic acid [AIIMS 2015]

16. Environmental Chemistry – Answers Keys

1. Air Pollution

1	d	**2**	c	**3**	d	**4**	b	**5**	c
6	e	**7**	e	**8**	b	**9**	a	**10**	a
11	a	**12**	c	**13**	b	**14**	e	**15**	a
16	a	**17**	c	**18**	c	**19**	d	**20**	b
21	b	**22**	a	**23**	c	**24**	a	**25**	b

2. Water Pollution

1	d	**2**	a	**3**	c	**4**	c	**5**	b
6	c	**7**	c	**8**	a	**9**	c	**10**	c
11	a	**12**	b	**13**	b	**14**	b	**15**	a
16	a	**17**	a						

3. Different Types of Pollution and Pollutants

1	a	**2**	c	**3**	a	**4**	c	**5**	b
6	a	**7**	d	**8**	a	**9**	d	**10**	d
11	b	**12**	d	**13**	a	**14**	c	**15**	c

4. IIT-JEE/ AIEEE

1	d	**2**	b	**3**	b	**4**	b	**5**	d

5. NEET/ AIPMT/ CBSE-PMT

1	b	**2**	d	**3**	b	**4**	b	**5**	b
6	d	**7**	c						

6. Assertion & Reason

1	b	**2**	a	**3**	b	**4**	b		