# SOLVED EXAMPLES

- **Ex.1** How can domestic waste be used as manure ?
- Sol. Domestic waste comprises of two types of materials, biodegradable such as leaves, rotten food, etc., and nonbiodegradable such as plastics, glass metal, scrap, etc. The non-biodegradable waste is sent to industry for recycling The biodegradable waste should be deposited in the land fills. With the passage of time, it is converted into compost manure.
- **Ex.2** For your agricultural field or garden, you have developed a compost producing pit. Discuss the process in the light of bad odour, files and recycling of wastes for a good produce.
- **Sol.** The compost producing pit should be set up at a suitable place or in a tin to protect ourselves from bad odour and files. It should be kept covered so that files cannot make entry into it and the bad odour is minimized. The recyclable material like plastics, glass, newspapers, etc.. should be sold to the vendor who further sells it to the dealer. The dealer further supplies it to the industry involved in recycling process.
- **Ex.3** A large number of fish are suddenly found floating dead on a lake. There is no evidence of toxic dumping but you find an abundance of phytoplankton. Suggest a reason for the fish kill.
- Sol. Excessive phytoplankton (organic pollutants such as leaves, grass, trash, etc.) present in water is biodegradable. A large population of bacteria decomposes this organic matter in water. During this process they consume the oxygen dissolved in water. Water has already limited dissolved oxygen (= 10 ppm) which gets is further depleted. When the level of dissolved oxygen falls below 6 ppm, the fish cannot survive. Hence, they die and float dead in water.
- **Ex.4** What would have happened if the greenhouse gases were totally missing in the earth's atmosphere ? Discuss.
- Sol. The solar energy radiated back from the earth surface is absorbed by the greenhouse gases (i.e.  $CO_2$ ,  $CH_4$ ,  $O_3$ , CFC's and water vapour) present near the earth's surface. They heat up the atmosphere near the earth's surface and keep it warm. As a result, they keep the temperature of the earth constant and help in the growth of plants and existence of life on the earth. If there were no greenhouse gases, there would have no vegetation and life on the earth.
- **Ex.5** (i) Name two important sinks of  $CO_2$ .
  - (ii) What is marine pollution
    - (iii) What is humification?
    - (iv) What are viable and non-viable particulates?
- Sol. (i) Oceans (which dissolve it) and plants (which use it for photosynthesis)
  - (ii) Pollution of sea water due to discharge of wastes into it is called marine pollution.

(iii) The decomposition of organic material (leaves, root etc.) in the soil by microorganism to produce humus is called humification.

(iv) Viable particulates are small size living organisms such as bacteria, fungi, moulds, algae, etc. Non-viable particulates are formed by disintegration of large size materials or condensation of small size particles or droplets e.g. mist, smoke, fume and dust.

**Ex.6** Answer the following subparts

(i) What is loam soil?

- (ii) What are asbestosis and silicosis ?
- (iii) What are particulates and what is their approximate size?
- (iv) Name three natural source of air pollution
- (v) How are flue gases from industries feed from oxides of nitrogen and sulphur?



**Sol.** (i) Soil containing 34% air, 66% water along with humus is called loam soil is best for crops.

(ii) Asbestosis and silicosis is lung disease caused by particulates.

(iii) Particulates are finely divided solid or liquid particles suspended in air. Their size varies from  $2 \times 10^{-4} \mu$  to 500  $\mu$ 

(iv) Volcanic erruptions, forest fires and pollen grains of flowers.

(v) The flue gases are subjected to scrubbing with conc.  $H_2SO_4$  or with alkaline solutions such as  $Ca(OH)_2$  or  $Mg(OH)_2$  etc.

**Ex.** 7 (i) Why does rain water normally have a pH of about 5.6 / When does it become acid rain ?

(ii) Why is acid rain considered as a threat to Taj mahal?

(iii) Explain giving reason " The presence of CO reduces the amount of haemoglobin available in the blood for carrying oxygen to the body cells."

(iv) State briefly the reactions causing ozone layer depletion in the stratosphere.

**Sol.** (i) Normally rain has a pH of about 5.6 due to dissolution of CO<sub>2</sub> of the atmosphere into it

 $(CO_2 + H_2O \longrightarrow H_2CO_3 \implies 2H^+ + CO_3^{2-})$ . When the pH of rain falls below 5.6, it becomes acid rain.

(ii) Taj mahal is made of marble. The acid rain contains  $H_2SO_4$  which attacks the marble (CaCO<sub>3</sub>) thereby pitting it, discolouring it and making it lustreless.

 $CaCO_3 + H_2SO_4 \longrightarrow CaSO_4 + CO_2 + H_2O_2$ 

(iii) CO combines with haemoglobin of the red blood corpuscles (RBCs) about 300 times more easily than oxygen to form carboxyhaemoglobin reversibly as follows.

 $Hb + CO \implies HbCO.$ 

Thus it is not able to combine with oxygen to form oxyhaemoglobin and transport of oxygen to different body cells cannot take place.

- **Ex.8** What do you understand by greenhouse effect ? What are the major gases ?
- Sol. The warming of the earth or global warming due to re-emission of sun's energy absorbed by the earth followed by its absorption by  $CO_2$  molecules and  $H_2O$  vapour present near the earth's surface and then its radiaton back to the earth is called greenhouse effect.

Though  $CO_2$  is the main gas in the greenhouse effect, there are some other greenhouse gases also e.g. methane, chlorofluorocarbons, ozone, nitrous oxide and water vapours.

**Ex.9** (i) What is composition of photochemical smog and classical smog ? How do the two differ in their behaviour ?

(ii) What should be the tolerable limit of fluoride ions in drinking water ? What happens if it is higher than 10 ppm

**Sol.** (i) Photochemical smog is mixture of number of irritation causing compounds like NO<sub>2</sub>, O<sub>3</sub> aldehydes, peroxyacyl nitrates, ketones, hydrocarbons and CO. It is formed in summer months after sunrise.

Classical smog is mixture of oxides of sulphur and carbons (soot). It is formed in early hours of winter months.

Photochemical smog is oxidising in nature whereas classical smog is reducing in nature.

(ii) 1 ppm or 1 mg dm<sup>-3</sup>. Higher concentration is harmful to bones and teeth.

E	xercise # 1	[Single Correct Choice T	ype Questions]							
1.	Air pollutants that produce photochemical oxid (A) $CO_2$ , CO and $SO_2$ (C) $O_2$ , $Cl_2$ and $HNO_3$ .	dants include : <b>(B)</b> $N_2O$ , NO and $HNO_3$ <b>(D)</b> $O_3$ , $Cl_2$ and $SO_2$								
2.	<ul><li>Atmosphere of big/metropolitian cities are poll</li><li>(A) automobile exhausts.</li><li>(C) household waste.</li></ul>	luted most by : (B) pesticide residue. (D) radio-active fall out.								
3.	Ozone layer of upper atmosphere is being dest (A) chlorofluorocarbon (C) photochemical oxidants/O <sub>2</sub> & CO <sub>2</sub>	royed by : (B) SO <sub>2</sub> (D) smog								
4.	Carbon monooxide is pollutant as it : (A) inactivates nerves (C) combines with oxygen	<ul><li>(B) inhibits glycolysis</li><li>(D) combines with haemon</li></ul>	globin							
5.	Pollution is : (A) removal of top soil (C) conservation of energy	<ul><li>(B) release of toxic/undesi</li><li>(D) all of above</li></ul>	irable materials in environment							
6.	Burning of fossil fuels is the main source of, w (A) Nitrogen oxide (B) Nitric oxide	hich of the following pollutants ? (C) Nitrous oxide	<b>(D)</b> Sulphur dioxide							
7.	SO <sub>2</sub> and NO <sub>2</sub> produce pollution by increasing a (A) alkalinity (B) acidity	: (C) neutrality	<b>(D)</b> buffer action							
8.	The aromatic compounds present as particulate (A) benzene (B) toluene	es are : (C) nitrobenzene	(D) polycyclic hydrocarbons							
9.	Classical smog occurs in places of : (A) excess CO <sub>2</sub> (B) cool and humid	(C) warm, dry and sunny	(D) excess NH <sub>3</sub>							
10.	<ul> <li>Acid rains are produced by :</li> <li>(A) excess NO<sub>2</sub> and SO<sub>2</sub> from burning fossil fuels</li> <li>(B) excess production of NH<sub>3</sub> by industry and coal gas</li> <li>(C) excess release of carbon monoxide by incomplete combustion</li> <li>(D) excess formation of CO<sub>2</sub> by combustion and animal respiration.</li> </ul>									
11.	Spraying of DDT produces pollution of the typ (A) air (B) air and water	e: (C) air and soil	<b>(D)</b> air, water and soil							
12.	Most hazardous metal pollutant of automobile (A) mercury (B) cadmium	exhausts is : (C) lead	(D) copper							
13.	Chlorofluorocarbon releases which of the follow (A) fluorine (B) chlorine	wing chemical harmful to ozone : (C) nitrogen peroxide	<b>(D)</b> sulphur dioxide							



# **CHEMISTRY FOR JEE MAIN & ADVANCED**

14.	<ul> <li>Which of the following statements is true about photochemical smog ?</li> <li>(A) It is reducing in nature.</li> <li>(B) it is formed in winter.</li> <li>(C) It is a sulphurous smog.</li> <li>(D) Components of the smog, NO and O<sub>3</sub>, irritate the nose and throat and their high concentration causes headache, chest pain, dryness of the throat, cough and difficulty in breathing.</li> </ul>									
15.	Which of the following is not a part of green chemist (A) Photochemistry (B) Sonochemistry	ry ? (C) Nuclear chemistry	(D) Biochemistry							
16.	Ultraviolet radiation from sun causes a reaction that p (A) fluorides (B) carbon monooxide	produces : (C) sulphur dioxide	(D) ozone							
17.	Ozone depletion in stratosphere shall result in : (A) forest fires (C) increase in biological oxygen demand	<ul><li>(B) increased incidence o</li><li>(D) global warming</li></ul>	f skin burns and skin cancer							
18.	Incomplete combustion of petrol or diesel oil in auto for the presence of ?	mobile engines can be best	detected by testing the fuel gases							
	(A) CO and water vapour (B) CO	$(\mathbf{C}) \operatorname{NO}_2$	<b>(D)</b> $SO_2$							
19.	<ul> <li>Which of the following statements is true about ozone layer ?</li> <li>(A) It is harmful because ozone is dangerous to living organism.</li> <li>(B) It is beneficial because oxidation reaction can proceed faster in the presence of ozone.</li> <li>(C) It is beneficial because ozone cuts off the ultra violet radiation of the sun.</li> <li>(D) It is harmful because ozone cuts out the important radiation of the sun which are vital for photosynthesis.</li> </ul>									
20.	Besides $CO_2$ , the other green house gas is : (A) $CH_4$ (B) $N_2$	( <b>C</b> ) Ar	<b>(D)</b> O <sub>2</sub>							
21.	<ul> <li>Which of the following statements is true ?</li> <li>(A) London smog is oxidising in nature.</li> <li>(C) London smog is mixture of smoke, fog and SO<sub>2</sub>.</li> </ul>	<ul><li>(B) London smog contain</li><li>(D) London smog causes</li></ul>	s $H_2SO_4$ droplets. bronchitis.							
22.	Which of the following processes does not increase t	the amount of CO <sub>2</sub> in atmos	sphere ?							
	(A) Decay of animals (B) Breathing	(C) Photosynthesis	(D) Burning of petrol							
23.	Consider the following statement and select the correct option : $S_1$ : Dust is the non-viable particle. $S_2$ : Particulates acquire negative charge and are attracted by the positive electrode. $S_3$ : $O_2$ is a green house gas. $S_4$ : Algae is a viable particulate.									
	(A) $S_1$ and $S_2$ only (B) $S_1$ , $S_2$ and $S_3$ only	(C) $S_1, S_2$ and $S_4$ only	<b>(D)</b> $S_2, S_3$ and $S_4$							
24.	Drained sewage has biological oxygen demand (BOD (A) more than that of water	(B) less than that of water	r							
	(C) equal to that of water	<b>(D)</b> none of the above								



# ENVIRONMENTAL CHEMISTRY

25.	Eutrophication causes reduction in :									
	(A) dissolved hydrogen	(B) dissolved oxygen	(C) dissolved salts	( <b>D</b> ) all the above						
26.	Sewage water is purified b	ру:								
	(A) microorganism	(B) light	(C) fishes	(D) aquatic plants						
27.	Which of the following w	ill increase the BOD of wat	er supply ?							
	(A) CO <sub>2</sub>	<b>(B)</b> O <sub>3</sub>	(C) H <sub>2</sub> O	<b>(D)</b> C <sub>2</sub> H <sub>5</sub> OH						
28.	Which causes water pollu	tion ?								
	(A) Pathogens	(B) Automobile exhausts	(C) PCBs	<b>(D)</b> (A) and (C)						
29.	Water pollution is less if E	BOD is :								
	(A) less than 5 ppm	(B) less than 15 ppm	(C) less than 50 ppm	(D) less than 100 ppm						
30.	Most abundant water pol	lutant is :								
	(A) detergents	(B) pesticides	(C) industrial wastes	(D) ammonia						
31.	Domestic waste mostly c	onstitutes :								
	(A) non-biodegradable po	llution	(B) biodegradable pollution							
	(C) effluents		(D) air pollution							
32.	Measurement of rate oxyg	gen utilisation by a unit volu	ame of water over a period	of time is to measure :						
	(A) fermentation		(B) biogas generation							
	(C) biosynthetic pathway		(D) biological oxygen der	nand.						
33.	Fishes die in water bodies	s polluted by sewage due to								
	(A) pathogens		(B) clogging of gills by si	lt						
	(C) reduction in oxygen		<b>(D)</b> foul smell							
34.	Phosphate pollution is ca	used by :								
	(A) weathering of phosph	ate rock only	(B) agriculture fertilizers	only						
	(C) phosphate rocks and	sewage	<b>(D)</b> sewage and agricultural fertilizers.							
35.	Which of the following st	atements is false ?								
	(A) The lower the concen	(A) The lower the concentration of dissolved oxygen, the more polluted is the water sample.								
	(B) The tolerable limit of l	ead in drinking water is 50 p	ppm.							
	(C) Water is considered p	ure if it has BOD less than :	5 ppm.							
	(D) None of the above									
36.	Which of the following st	atements is false ?								
	(A) The industrial and do	mestic sewage discharge is	the main reason for river w	ater pollution.						
	(B) Surface water contain	s a lot of organic matter and	l mineral nutrients.							
	(C) Oil spill in sea water	causes heavy damage to fisl	nery.							
	<b>(D)</b> Oil slick in sea water	increases dissolved oxygen								



# **CHEMISTRY FOR JEE MAIN & ADVANCED**

37.	<ul> <li>Modes of controlliing pollution in large cities includes :</li> <li>(A) cleanliness and less use of insecticides</li> <li>(B) proper disposal of organic wastes, sewage and industrial effluents.</li> <li>(C) use of liquefied carbondioxide with a suitable detergent in place of tetrachloroethene for dry cleaning.</li> <li>(D) all the above</li> </ul>								
38.	Which of the following is (A) Sodium chlorate	not a herbicide ? (B) Sodium arsenate	(C) Phosphate	(D) Triazines					
39.	DDT is : (A) green house gas (C) non-biodegradable po	ollutant	<ul><li>(B) biodegradable pollutant</li><li>(D) none of above</li></ul>						
40.	In stratosphere, which of	the following radical retards	s the formation of $O_3$ ?						
	(A) CH <sub>3</sub>	(B) ČI	(C) F	<b>(D)</b> Cl <sub>2</sub>					
41.	Which of the following h (A) Radioactive clouds (C) Spring clouds	antractia ? (B) Polar stratospheric cl (D) Smoke clouds	ric clouds						
42.	• Which are natural sinks for ClO radicals in other parts of stratosphere ? (A) SO <sub>2</sub> and NO <sub>2</sub> (B) NO and NO <sub>2</sub> (C) CH, and NO <sub>2</sub> (D) Cl <sub>2</sub> and F <sub>2</sub>								
43.	Eutrophication is a source (A) is low in nutrients (C) has high temperature	e of water pollution. It occu	rs when water : (B) is high in nutrients (D) has excess amount of	organic matter					
44.	<ul> <li>Which of the following statement is correct ?</li> <li>(A) Lower stratosphere consists of considerable amount of ozone.</li> <li>(B) Ozone layer protects humans living on earth from the harmful effect of ultraviolet radiations coming from sun.</li> <li>(C) Ozone is thermodynamically stable.</li> <li>(D) Smoke clouds play significant role in creating ozone over antarctica.</li> </ul>								
45.	Which of the following c (A) $CCl_4$	ompound belong to the clas (B) COCl <sub>2</sub>	ss of freons ? (C) C <sub>3</sub> O <sub>2</sub>	(D) $CF_2Cl_2$					
46.	The extensive use of CFC (A) its high chemical stab (C) its polar nature	"S as refrigerant fluids and i ility	in aerosol is because of : (B) good absorber of UV (D) high toxicity	radiation					
47.	Which of the following st (A) Absorption of the term (B) The global warming w (C) The global warming of (D) $CO_2$ , NO, $CH_4$ , $O_3$ , $CO_4$	tatements is false ? resterially radiated heat by the vill increases the rate of mel- of the earth surface is mainly Cl <sub>4</sub> and water vapour are gre	he carbondioxide is the main ting of <b>polar ice caps</b> increa by due to reforestation. The house gases.	n cause of global warming. asing the sea level.					







E	<b>Exercise # 2</b> Part # I > [Mul	tiple Correct Choice	Type Questions]
1.	Which of the following is/are correct about the size (A) Soot particles have diameter of about 5 nm. (B) $H_2SO_4$ fog particles have size of 500–1000 nm. (C) Fly ash particles have diameter of $5 \times 10^5$ nm. (D) All particulates have same size.	of particulates ?	
2.	<ul> <li>Choose the wrong statements :</li> <li>(A) CO<sub>2</sub> is responsible for greenhouse effect.</li> <li>(B) CO<sub>2</sub> can absorb infrafred radiation but does not</li> <li>(C) NO is more harmful than NO<sub>2</sub>.</li> <li>(D) acid rain contains mainly HNO</li> </ul>	allow them to pass through	
3.	<ul><li>Photochemical smog causes :</li><li>(A) headache</li><li>(C) corrosion of painted surface</li></ul>	<ul><li>(B) cracking of rubber</li><li>(D) extensive damage to</li></ul>	plant life
4.	<ul><li>Which of the following is/are proper method(s) to (A) Incineration</li><li>(C) Anaerobic digestion by microbes</li></ul>	dispose sludge ? (B) Dumping (D) Filtration	
5.	Which of the following metal(s) is/are toxic and poll (A) Cadmium (B) Lead	lutants ? (C) Mercury	(D) Zinc
6.	The depletion of ozone layer is caused by : (A) NO (B) SO <sub>2</sub>	(C) $C_x H_y$	(D) CFCs
7.	Which of the following is/are weedicides ? (A) Sodium chlorate (B) DDT	(C) Sodium arsenate	(D) BHC
8.	Which of the following is/are greenhouse gases ? (A) Ozone (B) Methane	(C) carbon dioxide	<b>(D)</b> Water vapours
	Part # II // [Assertion & Re:	ason Type Questions]	

This section contains reasoning type questions. Each question has 4 choices (A), (B), (C) and (D), out of which ONLY ONE is correct.

- (A) If both assertion and reason are true and reason is a correct explanation of assertion.
- (B) If both assertion and reason are true but reason is not a correct explanation of assertion.
- (C) If assertion is true but reason is false.
- (D) If assertion and reason both are false.
- 1. Assertion : Carbon dioxide is one of the main constituent of greenhouse gases. Reason : In pregnant women increased CO level induce premature birth, spontaneous abortions and deformed babies.
- Assertion: CO is a toxic air pollutant because.
   Reason: CO binds with haemoglobin of blood and reduces oxygen transport efficiency of blood.
- **3. Assertion :** The pH of rain water is 5.6

**Reason :** H<sup>+</sup> ions are formed by the reaction of rain water with carbondioxide present in the atmosphere.



- 4. Assertion : Photochemical smog results from the action of sunlight on unsaturated hydrocarbons and nitrogen oxides liberated by automobiles and factories.
  - **Reason :** Classical smog is a mixture of smoke, fog and sulphurdioxide.
- 5. Assertion : In the stratosphere, ozone is produced by the action of UV radiations on dioxygen.
   Reason : UV radiations split the molecular oxygen into free oxygen (O) atoms which combine with molecular oxygen to form ozone.
- 6. Assertion : The deficiency of fluoride in drinking water causes diseases such as tooth decay etc.
  - **Reason :** The F<sup>-</sup> ions make the enamel on teeth much harder by converting hydroxyapatite, the enamel on the surface of the teeth, into much harder fluorapatite.
- Assertion : Acid rain is harmful for agriculture, trees and plants.
   Reason : Acid rain dissolves and washes away nutrients need for the growth of agriculture, trees and plants.
- Assertion : Green plants maintain an appropriate level of CO<sub>2</sub> in the atmosphere.
   Reason : Green plants require CO<sub>2</sub> for photosynthesis and they, in turn, releases oxygen.
- 9. Assertion : Bacteria, fungi, moulds and algae are viable particulates.
   Reason : Smoke particulates consist of solid or mixture of solid and liquid particles formed during combustion of organic matter.





## **Comprehension #1**

Ozone is an unstable, dark blue diamagnetic gas. It absorbs strongly the UV radiation, thus protecting the people on the earth from the harmful UV radiation from the sun. The use of chlorofluorocarbon (CFC) in aerosols and refrigerators, and their subsequent escape into the atmosphere, is blamed for making holes in the ozone layer over the Antarctic, and Arctic.

Ozone acts as a strong oxidising agent in acidic and alkaline medium. For this property ozone is used as a germicide and disinfectant for sterilising water and improving the atmosphere of crowded places.

1. CFCs damage ozone layer by reactions :

(A) 
$$O_3 + hv \longrightarrow O + C$$

(B) 
$$CI + O_3 \longrightarrow CIO + O_2$$

(C)  $CIO + O \longrightarrow CI + O$ ,

(D) all of the above

Identify the incorrect statement with respect to ozone?

- (A) Ozone is formed in the upper atmosphere by a photochemical reaction involving dioxygen.
- (B) Ozone protects the earth's inhabitants by absorbing UV radiations.
- (C) Ozone can also be made by heating O<sub>2</sub> over 2500<sup>o</sup>C and quenching

(**D**) Chlorine gas is preferred over ozone for the purification of drinking water and for water treatment in swimming pools.

2.

- **3.** Which of the following statement is correct ?
  - (A) The dark blue colour of ozone is due to intense absorption of green light.
  - (B) Oxides of nitrogen and the halogen cannot damage the O<sub>3</sub> layer.
  - (C) Ozone oxidises dry iodine to  $I_2O_5$ .
  - (D) Ozone forms orange coloured compound KO<sub>3</sub> with potassium hydroxide.

## **Comprehension #2**

Pesticides are synthetic toxic chemicals which are used in agriculture to control the damages caused by insects, rodents, weeds and various crop diseases. Their repeated use give rise to pests that are resistant to that group of pesticides. As a result these pesticides become ineffective for those pests. Examples are DDT, aldrin, dieldrin etc.

Herbicides are the chemicals used to control weeds, earlier inorganic compounds such as sodium chlorate, and sodium arsenite were used but arsenic compounds being toxic to mammals, are no longer preferred instead organic compounds such as triazines, are now considered as better herbicides, especially for the corn-fields.

1.	Which of the following is a biodegradable pesticide ?								
	(A) DDT	(B) Aldrin	(C) Dieldrin	(D) None of these					
2.	Which of the following co	mpounds belongs to herbic	ides ?						
	(A) Sodium arsenite	(B) Sodium chlorate	(C) Triazines	(D) All of these					

- **3.** Which of the following statements is false ?
  - (A) The fly ash and slag of steel industry is being used by the cement industries
  - (B) Industrial wastes, agricultural pollutants and radioactive pollutants are the sources of soil pollutants.
  - (C) The recycling of material such as paper, glass and some kinds of plastics would help in the conservation of natural sources.
  - (D) BHC, malathon and chlorinated hydrocarbon are herbicides.







MOCK TEST

## **SECTION-I: STRAIGHT OBJECTIVE TYPE**

- 1. Photochemical smog can be reduced by :
  - (A) using catalytic converter in the automobiles
  - (B) plantation of certain plants like pinus, juniperus, vitis etc.
  - (C) both (A) and (B)

(D) None

2. Which of the following is false.

(A) Green house gases are carbondioxide, methane, water vapours, nitrous oxide, CFCs and ozone.

(B) CO is highly poisonous to living beings because of its ability to block the delivery of oxygen to the organs and tissues.

- (C) The troposphere contains dinitrogen, dioxygen, ozone and little water.
- (D) The primary source of air borne lead emission is leaded-petrol.
- **3.** Which of the following is false.
  - (A) Photochemical smog has high concentration of reducing agents and is, therefore, called as reducing smog.
  - (B) Non-viable particulates consist of smoke, dust, mist, fumes etc.
  - (C) Classical smog occurs in cool humid climate and it is mixture of smoke, fog and sulphurdioxide.
  - (D) Ozone reacts with unburnt hydrocarbons in polluted air to produce peroxyacetyl nitrate (PAN).
- 4. Which of the following does not contribute to water pollution ?
   (A) Pathogens
   (B) Organic wastes
   (C) chemical pollutants
   (D) none
- 5. BOD is :
  - (A) The amount of oxygen required to convert the NO in to NO, in a certain volume of a sample of water.
  - (B) The amount of F<sup>-</sup> ions required to convert, one mole of hydroxyapatite into fluorapatite.

(C) The amount of oxygen required by bacteria to break down the organic matter present in a certain volume of a sample of water.

(D) The amount of oxygen required to break down the non-biodegradable waste.

# **SECTION - II : MULTIPLE CORRECT ANSWER TYPE**

6. Which of the following is/are weedicides ?

(A) Sodium chlorate
(B) DDT
(C) Sodium arsenate
(D) BHC

7. Which of the following is/are greenhouse gases ?

(A) Ozone (B) Methane (

(C) carbon dioxide (D) Water vapours

## SECTION - III : ASSERTION AND REASON TYPE

Assertion : Green plants maintain an appropriate level of CO<sub>2</sub> in the atmosphere.
 Reason : Green plants require CO<sub>2</sub> for photosynthesis and they, in turn, releases oxygen.



# CHEMISTRY FOR JEE MAIN & ADVANCED

9. Assertion : Bacteria, fungi, moulds and algae are viable particulates.
 Reason : Smoke particulates consist of solid or mixture of solid and liquid particles formed during combustion of organic matter.

### **SECTION - IV : COMPREHENSION TYPE**

#### Read the following comprehensions carefully and answer the questions.

#### **Comprehension #1**

Pesticides are synthetic toxic chemicals which are used in agriculture to control the damages caused by insects, rodents, weeds and various crop diseases. Their repeated use give rise to pests that are resistant to that group of pesticides. As a result these pesticides become ineffective for those pests. Examples are DDT, aldrin, dieldrin etc. Herbicides are the chemicals used to control weeds, earlier inorganic compounds such as sodium chlorate, and sodium arsenite were used but arsenic compounds being toxic to mammals, are no longer preferred instead organic compounds such as triazines, are now considered as better herbicides, especially for the corn-fields.

10.	Which of the follo	wing is a biodegradable pes		
	(A) DDT	(B) Aldrin	(C) Dieldrin	(D) None of these
11.	Which of the follo	owing compounds belongs to	o herbicides ?	

(A) Sodium arsenite (B) Sodium chlorate (C) Triazines

**12.** Which of the following statements is false ?

(A) The fly ash and slag of steel industry is being used by the cement industries

(B) Industrial wastes, agricultural pollutants and radioactive pollutants are the sources of soil pollutants.

(C) The recycling of material such as paper, glass and some kinds of plastics would help in the conservation of natural sources.

(D) BHC, malathon and chlorinated hydrocarbon are herbicides.

### **SECTION - V : MATRIX - MATCH TYPE**

13. Match the entries of column-I with appropriate enteries of column-II. Each entry in column-I may have one or more than one correct option(s) from column-II.

#### Column-I

- (A) Acid rain
- (B) Green house effect
- (C) Ozone hole
- (D) Eutrophication

#### Column-II

- (p) Oxides of nitrogen
- (q) Oxides of sulphur
- (r) Carbon dioxide
- (s) Phosphate fertilizer i.e. plant nutrient (excess).

(D) All of these

(t) Chlorofluorocarbon (CFCs)



# **ANSWER KEY**

### EXERCISE - 1

1.	В	2.	А	3.	А	4.	D	5.	В	6.	D	7.	В	8.	D	9.	В	10. A	11. D	<b>12.</b> C	<b>13.</b> B
14.	D	15.	С	16.	D	17.	В	18.	В	19.	С	20.	А	21.	С	22.	С	<b>23.</b> C	24. A	<b>25.</b> B	26. A
27.	А	28.	D	29.	А	30.	А	31.	В	32.	D	33.	С	34.	D	35.	D	36. D	37. D	<b>38.</b> C	<b>39.</b> C
40.	В	41.	В	42.	С	43.	В	44.	В	45.	D	46.	А	47.	С	48.	С	<b>49.</b> D	50. A		

EXERCISE - 2 : PART # I

**1.** A, B, C **2.** C, D **3.** A, C, D **4.** A, B, C **5.** A, B, C **6.** A, D **7.** A, C **8.** A, B, C, D

PART # II

1. B 2. A 3. C 4. B 5. A 6. A 7. A 8. A 9. B

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## EXERCISE - 3 : PART # I

1.  $A \rightarrow (p), B \rightarrow (q), C \rightarrow (r, s, t), D \rightarrow (p, q)$ 2.  $A \rightarrow (p, q), B \rightarrow (r), C \rightarrow (p, t), D \rightarrow (s)$ 

### PART # II

Comprehension #1:	1.	D	2.	D	3.	D
Comprehension # 2:	1.	D	2.	D	3.	D

**EXERCISE - 4** 

**1.** 3 **2.** 1 **3.** 3

### **MOCK TEST**

**1.** C **2.** C **3.** A **4.** D **5.** C **6.** A,C **7.** A,B,C,D **8.** A **9.** B **10.** D **11.** D **12.** D **13.** A $\rightarrow$ (p,q), B $\rightarrow$ (r), C $\rightarrow$ (p,t), D $\rightarrow$ (s)

