1. The possibility of photochemical smog formation is more at

[2023 (06 Apr Shift 1)]

(1) Marshy lands

(2) Industrial areas

(3) Himalayan villages in winter

(4) The places with healthy vegetation

2. The group of chemicals used as pesticide is

[2023 (06 Apr Shift 2)]

(1) Aldrin, Sodium Chlorate, Sodium arsinite

(2) DDT, Aldrin

(3) Sodium chlorate, DDT, PAN

(4) Dieldrin, Sodium arsinite, Tetrachloroethene

3. Match List I with List II

List-I Species		**List-2 Maximum allowed concentration in ppm in drinking water**	
A	F^-	I	< 50 ppm
B	SO_4^{2-}	II	< 5 ppm
C	NO_3^-	III	< 2 ppm
D	Zn	IV	< 500 ppm

Choose the correct answer from the options given below.

[2023 (08 Apr Shift 1)]

(1) A-I, B-II, C-III, D-IV

(2) A-II, B-I, C-III, D-IV

(3) A-IV, B-III, C-II, D-I

(4) A-III, B-II, C-I, D-IV

4. Which of these reactions is not a part of breakdown of ozone in stratosphere?

[2023 (08 Apr Shift 2)]

(1) $2\,\overset{\odot}{Cl}\,O(g) \rightarrow ClO_2(g) + \overset{\odot}{Cl}(g)$

(2) $ClO\overset{\odot}{(g)} + O(g) \rightarrow O_2(g) + \overset{\odot}{Cl}$

(3) $\overset{\odot}{Cl}(g) + O_3(g) \rightarrow O_2(g) + ClO\overset{\odot}{(g)}$

(4) $CF_2\,Cl_2(g) \xrightarrow{uv} \overset{\odot}{Cl}(g) + \overset{\odot}{C}F_2\,Cl(g)$

5. Match List I with List II

	List I Industry		List II Waste Generated
(A)	Steel plants	(I)	Gypsum
(B)	Thermal power plants	(II)	Fly ash
(C)	Fertilizer Industries	(III)	Slag
(D)	Paper mills	(IV)	Bio-degradable wastes

Choose the correct answer from the options given below :

[2023 (10 Apr Shift 1)]

(1) (A)−(III), (B)−(II), (C)−(I), (D)−(IV)

(2) (A)−(III), (B)−(IV), (C)−(I), (D)−(II)

(3) (A)−(II), (B)−(III), (C)−(IV), (D)−(I)

(4) (A)−(IV), (B)−(I), (C)−(II), (D)−(III)

6. The delicate balance of CO_2 and O_2 is NOT disturbed by

[2023 (10 Apr Shift 2)]

(1) Respiration

(2) Burning of coal

(3) Deforestation

(4) Burning of petroleum

7. Given below are two statements :

Statement-I : If BOD is 4 ppm and dissolved oxygen is 8 ppm , then it is a good quality water.

Statement-II : If the concentration of zinc and nitrate salts are 5 ppm each, then it can be a good quality water.

In the light of the above statements, choose the most appropriate answer from the options given below :

[2023 (11 Apr Shift 1)]

(1) Statement I is correct but Statement II is incorrect

(2) Statement I is incorrect but Statement II is correct

(3) Both the statements I and II are incorrect

(4) Both the statements I and II are correct

8. Which of the following compounds is an example of Freon?

[2023 (11 Apr Shift 2)]

(1) $C_2H_2F_2$

(2) C_2F_4

(3) C_2HF_3

(4) $C_2Cl_2F_2$

9. Match List I with List II

	List I		List II
A	Nitrogen oxides in air	I	Eutrophication
B	Methane in air	II	pH of rain water becomes 5.6
C	Carbon dioxide	III	Global warming
D	Phosphate fertilisers in water	IV	Acid rain

Choose the correct answer from the options given below :

[2023 (12 Apr Shift 1)]

(1) A-II, B-III, C-I, D-IV

(2) A-I, B-II, C-III, D-IV

(3) A-IV, B-III, C-II, D-I

(4) A-IV, B-II, C-III, D-I

10. The radical which mainly causes ozone depletion in the presence of UV radiations is :

[2023 (13 Apr Shift 1)]

(1) $\dot{Cl}$

(2) $\dot{NO}$

(3) $\dot{OH}$

(4) $\dot{CH_3}$

11. Which of the following are the Green house gases?

A. Water vapour

B.Ozone

C.I_2

D.Molecular hydrogen

Choose the most appropriate answer from the options given below :

[2023 (13 Apr Shift 2)]

(1) A and D only

(2) B and C only

(3) A and B only

(4) C and D only

12. The possibility of photochemical smog formation will be minimum at

[2023 (15 Apr Shift 1)]

(1) Srinagar, Jammu and Kashmir in January

(2) Kolkata in October

(3) Mumbai in May

(4) New-Delhi in August (Summer)

ANSWER KEYS

1. (2)	**2.** (2)	**3.** (4)	**4.** (1)	**5.** (1)	**6.** (1)	**7.** (4)	**8.** (4)
9. (3)	**10.** (1)	**11.** (3)	**12.** (1)				

1. (2)

Photochemical smog is a mixture of pollutants that are formed when nitrogen oxides and volatile organic compounds (VOCs) react to sunlight, creating a brown haze above cities. It tends to occur more often in summer, because that is when we have the most sunlight.
Photochemical smog formation will be more at Industrial areas.

2. (2)

DDT(dichlorodiphenyltrichloroethane) and Aldrin are two synthetic pesticides that were widely used for insect control. Pesticides are groups of chemicals used for destruction of insects, weeds, fungi, bacteria etc. They are generally called insecticides, fungicides, bactericides, herbicides and rodenticides.

3. (4)

	Species	Maximum allowed concentration in ppm in drinking water
A.	F^-	2
B.	SO_4^{2-}	500
C.	NO_3^-	50
D.	Zn	5

F^- ion concentration above 2 ppm causes brown mottling of teeth. At the same time, excess fluoride (over 10 ppm) causes harmful effect to bones and teeth.
Excessive sulphate (>500 ppm) in drinking water causes laxative effect, otherwise at moderate levels it is harmless.
The maximum limit of nitrate in drinking water is 50 ppm. Excess nitrate in drinking water can cause disease such as methemoglobinemia ('blue baby' syndrome).

4. (1)

Chlorofluorocarbon compounds (CFCs) are non-reactive, non-flammable molecules that are used in refrigerators, air conditioners, plastics, and electronic industries. Once released CFCs mix with atmospheric gases and reach the stratosphere, where they are decomposed by UV radiations.

$$CF_2Cl_2(g) \xrightarrow{uv} \overset{\odot}{Cl}(g) + \overset{\odot}{C}F_2Cl(g)$$

The chlorine radical released will react with ozone.

$$\overset{\odot}{Cl}(g) + O_3(g) \rightarrow O_2(g) + Cl\overset{\odot}{O}(g)$$

The $\overset{\odot}{Cl}O$ will generate chlorine radicals again

$$Cl\overset{\odot}{O}(g) + O(g) \rightarrow O_2(g) + \overset{\odot}{Cl}$$

5. (1)

The various solid wastes in the form of slags and sludges that are emerged from steel plants are blast furnace slag. Fly ash is a fine by-product recovered from gases of burning coal in thermal power plants. Gypsum is the waste of fertiliser industry. Non-cellulosic part of plant is wastes of paper industry and it is biodegradable.

6. (1)

Plants use up carbon dioxide during photosynthesis and release oxygen into the atmosphere. This maintains the delicate balance between oxygen and carbon dioxide in the atmosphere.
The burning of fuels and cutting of trees is disturbing this balance in nature. As a result of such activities, the amount of carbon dioxide in the air is going up and the level of oxygen is coming down. Continuous and excessive use of fuels and deforestation would increase this imbalance. This is bringing about a warming of the atmosphere, called global warming. Respiration, is a natural process, So balance of CO_2 and O_2 not disturbed by respiration.

7. (4)

Drinking water has a BOD level of $1 - 2$ ppm. When the BOD value of water is in the range $3 - 5$ ppm, the water is moderately clean. Polluted water has a BOD value in the range of $6 - 9$ ppm. Healthy water should generally have dissolved oxygen concentrations above $6.5 - 8$ mg /L

Drinking water with concentrations of nitrate (measured as nitrate-nitrogen) below 10 mg of nitrate per liter of water (mg /L) is considered safe. Permissible limit of Zn in potable water is 5 ppm.

8. (4)

$C_2 Cl_2 F_2$ is an example of freon. It can act as an aerosol propellant, refrigerant, or organic solvent because it is a gas at room temperature and a liquid when cooled or compressed. Freon is a term that was commonly used to refer to a group of chlorofluorocarbon (CFC) and hydrochlorofluorocarbon (HCFC) compounds.

9. (3)

Nitogen oxides are produced by various natural and human activities, including combustion processes, industrial emissions, and vehicle exhaust. These are responsible for acid rains.

Methane (CH_4) is a potent greenhouse gas that contributes to global warming. While carbon dioxide (CO_2) is the most well-known greenhouse gas. Carbon dioxide present in air, react with the rain water to form carbonic acid.

The excessive use or runoff of phosphate fertilizers into bodies of water can contribute to eutrophication.

A	Nitrogen oxides in air	IV	Acid rain
B	Methane in air	III	Global warming
C	Carbon dioxide	II	pH of rain water becomes 5.6
D	Phosphate fertilisers in water	I	Eutrophication

$\therefore$ A-IV; B-III; C-II; D-I

10. (1)

Chlorofluorocarbons are chemicals which contain carbon, chlorine and fluorine. Ozone layer breaks when these CFC's are released into the atmosphere.So. Chlorine is one of the radical which belongs to CFC's family, responsible for break down.

11. (3) The greenhouse effect is a process that occurs when gases in Earth's atmosphere trap the Sun's heat. This process makes Earth much warmer than it would be without an atmosphere. The main greenhouse gases whose concentrations are rising are carbon dioxide, methane, nitrous oxide, hydrochlorofluorocarbons (HCFCs), hydrofluorocarbons (HFCs) and ozone in the lower atmosphere. I_2 and H_2 are not green house gases.

12. (1)

Photochemical smog is a mixture of pollutants that are formed when nitrogen oxides and volatile organic compounds (VOCs) react to sunlight, creating a brown haze above cities. It tends to occur more often in summer, because that is when we have the most sunlight. The average temperature of Kashmir in January is estimated to be $-3.6^{\circ}C$ in Srinagar, $-11.8^{\circ}C$ in Pahalgam, and $-10.4^{\circ}C$ in Gulmarg as their minimum temperatures.