

2025

(NEP—2020)

(5th Semester)

CHEMISTRY (MAJOR3/MINOR)**(Environmental Chemistry)**

Full Marks : 75

Time : 3 hours

*The figures in the margin indicate full marks for the questions***(SECTION : A—OBJECTIVE)**

(Marks : 10)

Tick (✓) the correct answer in the brackets provided :

1×10=10

1. Which of the following is not a primary air pollutant?

(a) Carbon monoxide (CO) ()

(b) Sulphur dioxide (SO₂) ()(c) Nitrogen oxides (NO_x) ()(d) Ozone (O₃) ()

2. The main chemical responsible for the depletion of the ozone layer in the stratosphere is

(a) methane (CH₄) ()(b) carbon dioxide (CO₂) ()

(c) chlorofluorocarbons (CFCs) ()

(d) nitrous oxide (N₂O) ()

3. Dissolved oxygen (DO) in water is important because it
- (a) helps in photosynthesis of plants ()
 - (b) supports aquatic life by enabling respiration ()
 - (c) causes water hardness ()
 - (d) reduces turbidity ()
4. Temporary hardness of water is mainly due to
- (a) calcium bicarbonate ()
 - (b) magnesium chloride ()
 - (c) calcium sulphate ()
 - (d) sodium carbonate ()
5. In the process of composting, complex organic matter is mainly converted into
- (a) simple inorganic salts ()
 - (b) humus and carbon dioxide ()
 - (c) methane and ammonia ()
 - (d) nitrate and phosphate salts ()
6. In anaerobic sludge digestion, the major gaseous product formed is
- (a) CO_2 ()
 - (b) H_2S ()
 - (c) CH_4 ()
 - (d) NH_3 ()
7. Which of the following is a commonly used method for sludge treatment?
- (a) Reverse osmosis ()
 - (b) Filtration ()
 - (c) Ion exchange ()
 - (d) Digestion ()
8. The unit commonly used for the measurement of noise intensity is
- (a) joule ()
 - (b) watt ()
 - (c) decibel (dB) ()
 - (d) hertz (Hz) ()

9. Which part of the human body is most affected by noise pollution?
- (a) Kidneys ()
 - (b) Ears ()
 - (c) Heart ()
 - (d) Eyes ()
10. Carbon monoxide toxicity occurs due to its strong binding with
- (a) hemoglobin ()
 - (b) platelets ()
 - (c) plasma proteins ()
 - (d) white blood cells ()

(SECTION : B—SHORT ANSWERS)

(Marks : 15)

Answer *five* questions, taking at least *one* from each Unit :

3×5=15

UNIT—I

1. What are the major regions of the atmosphere?
2. Write the chemical reactions involved in the formation of ozone in the stratosphere.

UNIT—II

3. Define biodegradable and non-biodegradable pollutants with suitable examples.
4. What is eutrophication? Write its causes and harmful effects.

UNIT—III

5. What is a sanitary landfill and how does it help in the safe disposal of solid waste?
6. What is the difference between water conservation and water recycling?

UNIT—IV

7. Define noise pollution. How is noise measured?
8. Briefly explain the biochemical effects of lead.

(SECTION : C—DESCRIPTIVE)

(Marks : 50)

Answer five questions, taking at least one from each Unit :

10×5=50

UNIT—I

1. (a) Explain the phenomenon of smog and its types. 5
(b) Write a short note on photochemical smog. 5
2. Write a note on greenhouse effect and global warming. 10

UNIT—II

3. (a) Explain different types of water pollutants with examples. 5
(b) Explain in brief dissolved oxygen. 5
4. What causes hardness of water? How do you soften hardness of water? 10

UNIT—III

5. (a) Explain the methods of sludge treatment and disposal. 5
(b) Explain reverse osmosis. 5
6. Differentiate between aerobic and anaerobic treatment processes in wastewater treatment. 10

UNIT—IV

7. Write a note on noise pollution hazards. 10
8. (a) Explain in brief cyanide and its toxic effects. 5
(b) Explain the biochemical effects of arsenic and cadmium. 5
