

SARDAR PATEL UNIVERSITY
M. Sc. -Integrated Biotechnology – Seventh Semester Examination
Tuesday, 18th October 2016
Time: 02:00 am to 05:00 pm
PS07CIGEB1: Environmental Chemistry

Total Marks – 70

[08]

Q.1 Mark the right answer of following questions.

1. A major burden of air pollution is carried by _____.
 a. Troposphere b. Stratosphere c. Ionosphere d. Thermosphere
2. The conversion of amino acids to ammonium by soil decomposers is called _____.
 a. Ammonification b. Mineralization c. Deamination d. N₂-fixation e. Both a & b
3. Which three layers form the soil profile
 a. Air, water and soil c. Minerals, organic matter and living organisms
 b. Clay, silt and sand d. The topsoil, subsoil and parent material
4. Which species readily react with organic compound?
 a. •OH b. HOO• c. Cl d. a & b e. b & c f. All of these
5. Thermal power plants pollute water by _____.
 a. Heavy metals b. Heat c. Dissolved solids d. both a & b e. All of these
6. $S^{\circ} + 1.5O_2 + H_2O \rightarrow H_2SO_4$, reaction is carried out by _____ chemoautotroph.
 a. *Thiobacillus denitrificans* c. *Desulfuromonas thiooxidans*
 b. *Thiothrix & Beggiatoa* d. *Thiobacillus thiooxidans*
7. Volcano eruption releases _____ in the atmosphere.
 a. SO₂ b. CO₂ c. CH₄ d. O₃ e. N₂ f. CO
8. Why is organic matter (humus) an important part of soil?
 a. It helps to improve water infiltration c. It converts N₂ in to NO₃ which is used by plants
 b. It can break down organic pollutants d. Rich in nutrients, which is important for fertility

Q.2 Answer the following questions. (ANY SEVEN OUT OF NINE)

[14]

1. Explain mineralization-immobilization and adsorption-desorption processes for phosphorus transformation.
2. Define soil pollution. Which conditions are responsible for polluting the soil?
3. Enlist air pollutants and write their sources.
4. Write the roles of anammoxosome. Draw the cycle of ANAMMOX.
5. Explain the significance of bio-geochemical cycles.
6. Define eutrophication and write its adverse effects.
7. Write the types and effects of aerosols.
8. Describe various factors of soil erosion with appropriate example.
9. Explain why water is considered as universal solvent?

(P.T.O.)

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- Q.3** A. Draw nitrogen cycle. Write a note on ammonia assimilation and nitrification. [06]
B. Enlist reservoirs of sulfur with suitable examples. Discuss microbial assimilatory sulfate reduction and sulfur oxidation processes. [06]

OR

- B. Write short notes on: 1. Organic Polymer 2. Humic material and formation of humus [06]

- Q.4** A. How soil is formed? Explain physical, chemical and biological properties of soil. [06]
B. What are the selection criteria for the treatment of contaminated soil? Outline physical and chemical treatment processes used for contaminated soil. [06]

OR

- B. Define soil erosion. Summarize types, effects, mechanism and preventing measures for soil erosion. [06]

- Q.5** A. Enlist various analytical methods for monitoring of air pollution. Write general reactions occur in troposphere and stratosphere. [06]
B. Define GHE. Give a detailed account on GHGs, effects and preventive measures of green house effect. [06]

OR

- B. Explain mechanisms of O₃ formation. Write mechanisms and effects of ozone depletion. [06]

- Q.6** A. Write the examples and sources of water pollutants. Discuss inorganic and toxic metals as water pollutants. [06]
B. Define acid rain. How acid rain is formed? Write adverse effects of acid rain. [06]

OR

- B. Write short notes on: 1. Physical and chemical properties of water [06]
2. Sources and detrimental effects of pesticides and radionuclide.

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