

Roll No. : .....

Total No. of Questions : 16 ]

[ Total No. of Printed Pages : 3

# SEM-1027

M.Sc. (Ist Semester) Examination, 2022

ENVIRONMENTAL SCIENCE

Paper - FS-ENV-CC-103

(Environmental Chemistry)

Time : 3 Hours ]

[ Maximum Marks : 40

The question paper contains three Sections.

**Section-A**

**(Marks : 1 × 10 = 10)**

**Note :-** The candidate is required to answer all the *ten* questions carries 1 mark each. The answer should not exceed **50** words.

**Section-B**

**(Marks : 3 × 5 = 15)**

**Note :-** The candidate is required to answer *five* questions by selecting at least *one* question from each Unit. Each question carries **3** marks. Answer should not exceed **200** words.

**Section-C**

**(Marks : 5 × 3 = 15)**

**Note :-** The candidate is required to answer *three* questions by selecting *one* question from each Unit. Each question carries **5** marks. The answer should not exceed **500** words.

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### Section–A

1. Attempt all questions :
  - (i) Define Stoichiometry.
  - (ii) What do you mean by Acids ?
  - (iii) Define Radionucleoids.
  - (iv) Write the major components of air.
  - (v) What do you mean by Air Pollutants ?
  - (vi) What is Smog ?
  - (vii) Define Biological Oxygen Demand (BOD).
  - (viii) What is Coagulation ?
  - (ix) What is NPK ?
  - (x) Write two importances of “dissolved oxygen” in aquatic ecosystem.

### Section–B

#### Unit–I

2. Give detailed account on “Gibbs’ Free Energy”.
3. Write note on Chemical Potential.
4. Differentiate between saturated and unsaturated hydrocarbons.

#### Unit–II

5. Give detailed account on chemical processes for formation of organic particulate matter with suitable examples.
6. Write note on ozone chemistry.
7. Write adverse impacts of air pollutants on human health.

#### Unit–III

8. What is Sedimentation ? Write short note on it.
9. Explain the concept of COD.
10. Write note on inorganic and organic components of soil.

### Section–C

**Note** :- Answer *three* questions in the Section, by selecting *one* question from each Unit in about **500** words. Each question carries **5** marks.

#### Unit–I

11. Give detailed account on solubility of gases in water.
12. Write notes on the following :
  - (a) Solubility product ( $K_{sp}$ )
  - (b) Acid-Base Reaction.

#### Unit–II

13. What is Photochemical Smog ? How London Smog was different from Los Angeles smog ? Give detailed account on it.
14. Explain the thermochemical and photochemical reactions in the atmosphere.

#### Unit–III

15. What do you mean by “Redox Potential” ? Explain it with suitable example.
16. Write detailed note on nitrogen pathway and NPK in soil.