I SEMESTER, M.Sc. IN ENVIRONMENTAL SCIENCE
OPEN BOOK EXAMINATION, JANUARY 2021

ES 1.1: ENVIRONMENTAL CHEMISTRY

Time: 3 Hours **Max. Marks: 80**

Instruction: *Answer all the sections.*

Section A

Answer any **FOUR** questions from the following **4 × 5 = 20**

1. List different types of chemical reactions. Explain any one of them with example.
2. Explain the fundamental concepts of electrochemistry in relation to characteristics of current flow through metal.
3. Explain the following:
   a. Tyndall effect b. Brownian movement
4. Briefly explain the procedure for determination of dissolved oxygen in water by 'Winkler's method'.
5. With a flow diagram explain the phosphorus cycle.
6. Briefly discuss the components of Gas Chromatography.

Section B

Answer any **THREE** questions from the following **3 × 10 = 30**

7. With neat sketch explain the method of measurement of pH using Calomel electrode.
8. Discuss briefly the electrical properties of colloids in relate to water and wastewater treatment.
9. Write a short note on:
   a. Minamata disease b. Pollution problems of leather industries
10. Explain the basic working principles of the following:
    a. Flame photometer b. Ion selective electrode
11. With an example, explain the typical conductometric titration curves for strong acid with strong base.

Section C

Answer any **TWO** questions from the following **2 × 15 = 30**

12. Discuss the following:
    a. Importance of chemistry in environmental science
    b. Chemical equations to describe the ionization of acid and bases with examples.
13. List the various types of colloidal dispersions. Discuss in detail about application of colloids in wastewater treatment

14. Enumerate various types of water pollution. Discuss each one of them briefly.
15. Discuss the following:
    a. Various types of optical methods of analysis of water and wastewater
    b. Lambert's and Beer's law with examples

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OPEN BOOK EXAMINATION, JANUARY 2021

ES 1.2: ENVIRONMENTAL EARTH SCIENCE

Time: 3 Hours **Max. Marks: 80**

Instruction: *Answer all the sections.*

Section A

Answer any **FOUR** questions from the following **4 × 5 = 20**

1. Discuss on minerals and their classifications.
2. What is magma? Explain characteristics of magma.
3. Explain natural resources and its associated problems.
4. Which are the drivers of environmental scarcity.
5. What is terrain evaluation? Explain it's principles.
6. Briefly explain the formation of soil.

Section B

Answer any **THREE** questions from the following **3 × 10 = 30**

7. What are the natural hazards? Explain with examples.
8. Explain the physical properties of minerals.
9. Describe the different types of rocks.
10. What are the three different topographic regions of India.
11. Discuss the internal structure of earth.

Section C

Answer any **TWO** questions from the following **2 × 15 = 30**

12. What are catastrophic geological hazards? Explain in detail.
13. Describe in detail on concept of disaster management.
14. Explain the various types of disasters.
15. Explain the geochemical cycle with schemitics for the following:
    a. Hydrological cycle b. Carbon cycle

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I SEMESTER, M.Sc. IN ENVIRONMENTAL SCIENCE

OPEN BOOK EXAMINATION, JANUARY 2021

ES 1.3: ENVIRONMENTAL MICROBIOLOGY

Time: 3 Hours **Max. Marks: 80**

Instruction: *Answer all the sections.*

Section A

Answer any **FOUR** questions from the following **4 × 5 = 20**

1. Describe the replication of viruses.

2. Give an account of abiotic and biotic components of an ecosystem.

3. Describe eutrophication and its adverse effects on water bodies.

4. Explain the nutritional types of bacteria.

5. Write a note on microbial degradation of pesticides.

6. Give a brief account of anaerobic respiration.

Section B

Answer any **THREE** questions from the following **3 × 10 = 30**

7. Discuss the strain improvement and preservation of industrially important microorganisms.
8. Explain the sexual reproduction in fungi with neat diagram.
9. Discuss the interaction of microorganisms in biological environment.
10. Differentiate anabolism and catabolism. Explain the role of pyruvate as a control metabolite.
11. Describe the structure, formation and germination of bacterial endospore with neat diagrams.

Section C

Answer any **TWO** questions from the following **2 × 15 = 30**

12. Give an account of waterborne diseases.
13. What are algal blooms? Explain the problems associated with it and it's control measures.
14. Explain the physical and chemical methods of controlling microorganisms.
15. What are enzymes? Explain its structure, mechanisms of action, inhibition and applications.

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I SEMESTER, M.Sc. IN ENVIRONMENTAL SCIENCE

OPEN BOOK EXAMINATION, JANUARY 2021

ES 1.4: ECOLOGY AND ENVIRONMENT

Time: 3 Hours **Max. Marks: 80**

Instruction: *Answer all the sections.*

Section A

Answer any **FOUR** questions from the following **4 × 5 = 20**

1. Write a brief note on biomagnification.
2. Explain ecological pyramids.
3. Briefly explain the method for measurement of primary productivity.
4. What are the causes of biodiversity loss?
5. Briefly outline the forest resource management.
6. Discuss in brief the classification of lakes based on nutrient level.

Section B

Answer any **THREE** questions from the following **3 × 10 = 30**

7. Write a note on abiotic components of the ecosystem.
8. What are ecological indicators? Explain with examples.
9. Write a note on water resources. Comment on water management.
10. What is deforestation? Explain its causes and consequences.
11. Explain the concept of ecological niche.

Section C

Answer any **TWO** questions from the following **2 × 15 = 30**

12. What are the types of natural resources? Explain each one with examples with a note on energy crisis.
13. Define ecosystem. Explain its functional attributes with reference to pond ecosystem.
14. What is ecological succession? Explain its stages with examples.
15. What are the strategies for conservation of plants and animals? Give examples.

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