



Khulna University, Khulna

School: Life Science	Discipline: Environmental Science	Program: B.Sc. in Environmental Science
Year: 4 th	Term: I	Examination Year: 2026
Course Code: 052110 ES 4109		Session: 2024-2025
Total Marks: 60	Time: 3 Hours	Course Title: Pollution Biology
		Credit: 2.0

Instructions: Use Separate answer script for each section.

Section A

There are four (04) questions in this section. Answer any three (03) questions.

1.
 - a) Define pollution and explain its major types. [L1; CLO1] 02
 - b) "Pollution is a stepwise process, and it has many phases."- explain [L2; CLO2] 02
 - c) Explain the physiological responses of plants to air pollutants (SO₂, NO_x). [L3; CLO2] 03
 - d) Evaluate long-term ecological impacts of air pollution on biodiversity. [L5; CLO2] 03
2.
 - a) What is plant-based air pollution monitoring? [L1; CLO3] 03
 - b) Explain the role of lichens as bio-indicators of air pollution. [L2; CLO3] 03
 - c) Evaluate biological monitoring compared to instrumental monitoring methods. [L5; CLO3] 04
3.
 - a) Differentiate between passive and active bio-monitoring techniques. [L1; CLO2] 02
 - b) Explain how plants act as sinks for air pollutants. [L2; CLO2] 02
 - c) Compare absorption and adsorption mechanisms in plants. [L4; CLO2] 03
 - d) Analyze the mechanisms of phytoremediation and CO₂ sequestration in air pollution control. [L6; CLO3] 03
4.
 - a) Define physico-chemical parameters of water. [L1; CLO1] 03
 - b) Explain the role of dissolved oxygen and temperature in aquatic life. [L2; CLO2] 03
 - c) How does pollution affect species composition and primary productivity in aquatic ecosystems? [L4; CLO3] 04

Section B

There are four (04) questions in this section. Answer any three (03) questions.

5.
 - a) Define and identify the attributes of a successful bioindicator. [L2; CLO3] 03
 - b) Enlist the groups of organisms present in soil. [L1; CLO2] 02
 - c) Describe the various zones of the saprobic system and explain the response of organisms in each zone. [L3; CLO2] 05
6.
 - a) Illustrate the pathways of pollutants associated with the water environment. [L2; CLO2] 02
 - b) Differentiate among pollution, contamination, and toxin. [L2; CLO1] 03
 - c) How do plants response to soil pollution? Explain. [L3; CLO2] 05
7.
 - a) What are the factors affecting the plants response to soil pollution? Explain. [L2; CLO2] 05
 - b) How do waste disposal and sanitary landfill alter the soil characteristics? Explain. [L3; CLO2] 05
8.
 - a) Narrate the causes and effects of soil pollution. [L3; CLO2] 04
 - b) Briefly describe the role of "Blue mussel" as bioindicators. [L3; CLO3] 03
 - c) Define saprobic index and how to calculate saprobic index with example. [L4; CLO2] 03



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School: Life Science	Discipline: Environmental Science	Program: B.Sc. in Environmental Science
Year: 4 th	Term: I	Examination Year: 2026
Course Code: 052110 ES 4111		Session: 2024-2025
Total Marks: 60	Time: 3 Hours	Course Title: Occupational Health and Safety
		Credit: 2.0

Instructions: Use Separate answer script for each section.

Section A

There are four (04) questions in this section. Answer any three (03) questions.

1. a) Define Health, Safety, and Environment (HSE) and explain their interrelationship. [L2; CLO1] 03
b) Explain the hierarchy of hazard control and evaluate its effectiveness in workplace safety. [L3; CLO1] 03
c) Evaluate the effectiveness of hazard identification and control hierarchy in reducing workplace risks. [L5; CLO2] 04
2. a) Define risk assessment and risk management in environmental health. [L2; CLO2] 03
b) Design a risk assessment framework for communities exposed to water or air pollution in coastal Bangladesh. [L6; CLO3] 04
c) Describe the technique of risk communication with a suitable example. [L2; CLO2] 03
3. a) Compare compliance audit and functional environmental audit with examples. [L2; CLO3] 03
b) "Environmental audit acts as a compass toward business integrity." - Justify the statement with logical arguments. [L4; CLO4] 03
c) Develop an environmental audit framework for the textile industry in Bangladesh. [L6; CLO4] 04
4. a) Define occupational health hazards with examples. [L2; CLO4] 02
b) Evaluate the effectiveness of monitoring system in improving workplace safety. [L5; CLO5] 04
c) Design an indoor environmental monitoring system for industrial workplaces in Bangladesh. [L6; CLO5] 04

Section B

There are four (04) questions in this section. Answer any three (03) questions.

5. a) Environmental health underpin occupational health and safety-justify. [L5; CLO1] 04
b) Draw and illustrate a diagram interconnecting environmental justice, ethics, ecosystem and public health. [L4; CLO1] 04
c) How could you prevent 'oil spill on the floor' hazard to become a disaster? Explain [L3; CLO4] 02

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6.	a)	Demonstrate the relationship between hazard, risk and vulnerability.[L2; CLO1]	03
	b)	Note down the steps of risk management.[L1; CLO2]	02
	c)	Evaluate the flood risk in Bangladesh using matrix. [L5; CLO2]	05
7.	a)	Assess the application of the PDCA cycle for standardized nursing management in a COVID-19 intensive care unit.[L5; CLO4]	04
	b)	Describe the safety measures during driving car. [L4; CLO1]	02
	c)	Critically evaluate 'the workers welfare scheme' in the light of promoting industrial production. [L5; CLO1]	04
8.	a)	List out the basic stuffs for a regular basic first aid box.[L2; CLO6]	03
	b)	Explain the first aid procedure for burns and bleeding. [L2; CLO6]	03
	c)	Briefly describe the mechanisms of patient safety in hospital.[L2; CLO1]	04



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Year: 4 th	Term: I	Examination Year: 2026
Course Code: 052110 ES 4113		Session: 2024-2025
Total Marks: 60	Time: 3 Hours	Course Title: Epidemiology
		Credit: 2.0

Instructions: Use Separate answer script for each section.

Section A

There are four (04) questions in this section. Answer any three (03) questions.

1. a) Define Endemic and Epidemic. [L1; CLO1] 02
b) Which factors need to be considered when interpreting geographical distributions of disease? [L3; CLO2] 03
c) "Epidemiology is the backbone of public health". Critically evaluate this statement. [L4; CLO1] 05
2. a) Define morbidity and mortality. [L1; CLO5] 02
b) Define and briefly describe the different categories of death rates used in epidemiology. [L2; CLO5] 04
c) Describe the differences between incidence and prevalence. [L3; CLO5] 04
3. a) Describe in which studies the relative risk (RR) and the odds ratio (OR) are used. Outline the reasons why they would be used in a particular study and not in another. [L4; CLO9] 05
b) Experimental study is based on 3 characteristics of randomization, control and manipulation. Design with example. [L3; CLO9] 05
4. a) What are the different types of factors in disease causation? Explain. [L2; CLO4] 03
b) Explain the Principles for assessing the causation of disease. [L3; CLO5] 04
c) Describe the role of micronutrient deficiencies in disease development. [L2; CLO2] 03

Section B

There are four (04) questions in this section. Answer any three (03) questions.

5. a) Explain the concepts of disease distribution and frequency with suitable examples. [L2; CLO2] 04
b) Explain the epidemiological triad model and its importance in understanding disease causation. [L5; CLO3] 04
c) Explain the determinants of disease in epidemiology with appropriate environmental health examples. [L1; CLO5] 02
6. a) Define measures of association and explain their importance in epidemiological studies. [L1; CLO5] 02
b) Differentiate among Risk Ratio (RR), Odds Ratio (OR), and Risk Difference (RD) with suitable examples. [L2; CLO4] 04
c) Explain the concept of herd immunity and discuss its importance in disease prevention and public health management with suitable examples. [L4; CLO3] 04

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| 7. | a) Define epidemiological data collection.[L2; CLO3] | 02 |
| | b) Explain the concepts of population and sample, sampling protocols, and methods of data presentation and statistical analysis used in epidemiological studies.[L2; CLO3] | 04 |
| | c) Discuss different sampling techniques used in epidemiological studies. Explain the importance of statistical analysis and graphical/tabular presentation of epidemiological data.[L6; CLO4] | 04 |
| 8. | a) Define screening in epidemiology and public health. [L2; CLO4] | 02 |
| | b) Explain the objectives and principles of screening programs with suitable examples.[L1; CLO3] | 03 |
| | c) Explain the advantages, limitations, and importance of screening programs in disease prevention and public health management with suitable examples.[L2; CLO3] | 05 |
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School: Life Science	Discipline: Environmental Science	Program: B.Sc. in Environmental Science
Year: 4 th	Term: I	Examination Year: 2026
Course Code: 052110 ES 4121		Session: 2024-2025
Total Marks: 60	Time: 3 Hours	Credit: 3.0

Instructions: Use Separate answer script for each section.

Section A

There are four (04) questions in this section. Answer any three (03) questions.

1. a) Define coastal area and discuss the historical development of coastal management and planning. [L2; CLO1] 03
b) Discuss the various coastal regions in the world with examples. [L6; CLO2] 03
c) Narrate the different classification system in the coastal areas in the world. [L5; CLO2] 04
2. a) Explain the major coastal management practice in the world. [L4; CLO2] 05
b) Discuss the environmental impacts on coastal management. [L6; CLO2] 05
3. a) Discuss briefly the coastal depositional process and its impacts on land. [L6; CLO2] 05
b) Explain the various engineering coastal profiles and their necessity. [L4; CLO2] 05
4. a) Explain the various coastal protection systems in the world. [L4; CLO2] 05
b) Discuss the non-living resources in the coastal areas in the world. [L6; CLO2] 05

Section B

There are four (04) questions in this section. Answer any three (03) questions.

5. a) Describe how the coastal zone and coastal resources coincide. [L6; CLO3] 03
b) What are the major coastal resources of Bangladesh, including EEZ? [L5; CLO3] 03
c) What are the main physical processes shaping the Bangladesh coast? Describe the role of tides and river discharge in coastal formation. [L1; CLO5] 04
6. a) Define salinity intrusion in coastal Bangladesh. [L1; CLO5] 02
b) Discuss the impacts of cyclones and storm surges on the Bangladesh coast. [L2; CLO4] 04
c) Discuss the development issues in the coastal region of Bangladesh. [L6; CLO4] 04
7. a) What are polders and embankments? [L2; CLO3] 02
b) Explain Tidal River Management (TRM) as a coastal management approach. [L2; CLO3] 04
c) Explain the impact of climate change on coastal development. [L6; CLO4] 04
8. a) Discuss the evolution of coastal zone management policies in Bangladesh from 2001–2026. [L2; CLO4] 04
b) Explain the objectives and key focus areas of major coastal management plan, Bangladesh Delta Plan 2100. [L2; CLO3] 03
c) Discuss the major authorities and institutions responsible for coastal zone management and development actions in Bangladesh. [L2; CLO3] 03



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School: Life Science	Discipline: Environmental Science	Program: B.Sc. in Environmental Science
Year: 4 th	Term: I	Examination Year: 2026
Course Code: 052110 ES 4123		Session: 2024-2025
Total Marks: 60	Time: 3 Hours	Course Title: Waste Management
		Credit: 2.0

Instructions: Use Separate answer script for each section.

Section A

There are four (04) questions in this section. Answer any three (03) questions.

1.
 - a) Elucidate the difficulties in defining waste. [L2; CLO1,2] 03
 - b) Elaborate waste management criteria and approaches. [L3; CLO1,2] 04
 - c) Evaluate the waste collection system in a student residential hall in Khulna University. [L5; CLO1,2] 03
2.
 - a) Name different types of solid waste storage containers. [L2;CLO1,2] 02
 - b) Illustrate a conceptual mass balance in waste incineration. [L3; CLO3] 04
 - c) Analyze how collection frequency affects public health and sanitation. [L4; CLO3] 04
3.
 - a) Why and what kind of data we need to characterize the waste. [L1; CLO1,2] 04
 - b) Elaborate the issues in waste characterization. [L4; CLO1,2] 04
 - c) Write the importance of waste characterization. [L2; CLO1,2] 02
4.
 - a) What is resource recovery? State the benefits of resource recovery. [L2; CLO7] 03
 - b) What is composting? Illustrate and describe the phases of composting. [L3; CLO6,7] 04
 - c) Judge whether composting is the best solution for organic waste in urban areas. [L5; CLO5,6] 03

Section B

There are four (04) questions in this section. Answer any three (03) questions.

5.
 - a) Define hazardous waste and give a suitable classification of it. [L1; CLO1,2] 03
 - b) Distinguish between non-specific source waste and source-specific waste.[L2; CLO1,2] 03
 - c) Analyze how the characteristic properties of hazardous waste influence environmental and public health risks.[L4; CLO1,2] 04
6.
 - a) Write down the major components of a hazardous waste management plan.[L1; CLO1,2] 02
 - b) Analyze the effectiveness of waste minimization as a component of hazardous waste management.[L4; CLO4,5,6] 03
 - c) Analytical laboratories of Khulna University regularly produce liquid hazardous waste. Propose a hazardous waste storage framework to protect the health and environment of the university community.[L6; CLO5,6] 05

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| 7. | a) | What is Waste Identification Number? Write the significance of it.[L1; CLO6,7] | 03 |
| | b) | What types of contaminants are removed by Reverse Osmosis in liquid hazardous waste treatment?[L5; CLO3] | 03 |
| | c) | Discuss how Reverse Osmosis removes contaminants from liquid hazardous waste with a suitable diagram.[L3; CLO3] | 04 |
| 8. | a) | Why are safe hazardous waste disposal facilities necessary?[L3; CLO4,5, 6] | 03 |
| | b) | Illustrate a schematic diagram of a secure landfill and label its main components.[L3; CLO4,5, 6,7] | 04 |
| | c) | Analyze the importance of liner systems in secure landfill design.[L4; CLO4,5,6] | 03 |
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Khulna University, Khulna

School: Life Science	Discipline: Environmental Science	Program: B.Sc. in Environmental Science
Year: 4 th	Term: I	Examination Year: 2026
Course Code: 052110 ES 4125	Course Title: Land Resources Planning and Management	
Total Marks: 60	Time: 3 Hours	Credit: 2.0

Instructions: Use Separate answer script for each section.

Section A

There are four (04) questions in this section. Answer any three (03) questions.

1.
 - a) Define land resources with examples. [L2; CLO1] 03
 - b) What are the major concerns related to land resources? Distinguish between developed and low-income country scenarios.[L1; CLO1] 03
 - c) Mention the main types of land degradation.[L2; CLO1] 04
2.
 - a) Define land resource inventory and its objectives. [L1; CLO3] 03
 - b) Explain the landscape approach in land resource surveys. [L2; CLO3] 03
 - c) Analyze the role of agro-ecological surveys in land use planning. [L4; CLO4] 04
3.
 - a) What are the major agro-ecological zones of the tropics?[L1; CLO2] 03
 - b) Write the key land resource issues in dryland areas.[L2; CLO2] 03
 - c) Explain the role of farmers in sustainable land resource management. [L4; CLO2] 04
4.
 - a) Why is soil survey important in land resource planning?[L1; CLO2] 04
 - b) State the advantages and limitations of participatory approaches for land survey and inventory development.[L1; CLO2] 04
 - c) Define natural resource survey and land evaluation.[L6; CLO2] 02

Section B

There are four (04) questions in this section. Answer any three (03) questions.

5.
 - a) Define Sustainable Land Management (SLM). [L1; CLO5] 02
 - b) Explain the principles of SLM. [L2; CLO5] 02
 - c) Analyze major barriers to SLM in developing countries. [L4; CLO5] 03
 - d) Should restoration be prioritized over prevention? Justify. [L5; CLO5] 03
6.
 - a) What is land capability classification? Discuss. [L1; CLO5] 04
 - b) Explain the two-stage and parallel approaches for land evaluation with a schematic diagram. [L2; CLO3] 03
 - c) Design a land suitability assessment for crop production. [L6; CLO4] 03

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| 7. | a) | What is Environmental Impact Assessment (EIA)? [L1; CLO3] | 02 |
| | b) | Explain the structure and methodology of the LESA system. How does it guide land use decisions? [L5; CLO3] | 03 |
| | c) | Why is EIA considered both a technical and participatory tool? [L3; CLO3] | 02 |
| | d) | Design an EIA framework for a proposed agricultural project. [L6; CLO4] | 03 |
| 8. | a) | Explain the concept of food security. [L2; CLO5] | 02 |
| | b) | Analyze the four pillars of food security. [L4; CLO5] | 02 |
| | c) | Explain the relationship between SLM and food security. [L2; CLO5] | 03 |
| | d) | How do policies influence sustainable land use? [L2; CLO3] | 03 |
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Khulna University, Khulna

School: Life Science	Discipline: Environmental Science	Program: B.Sc. in Environmental Science
Year: 4 th	Term: I	Examination Year: 2026
Course Code: 052110 ES 4155		Session: 2024-2025
Total Marks: 60	Time: 3 Hours	Credit: 2.0

Instructions: Use Separate answer script for each section.

Section A

There are four (04) questions in this section. Answer any three (03) questions.

1. a) Define urbanization. [L1; CLO1] 02
b) Explain the role of various stages for the formation of urbanization. [L4; CLO1] 04
c) Explain the importance of urbanization and the environment in environmental management. [L4; CLO1] 04
2. a) Define industry. [L1; CLO1] 02
b) Mention the various classification for industrialization. [L3; CLO2] 04
c) Discuss the industrialized pollution in Khulna City.[L6; CLO3] 04
3. a) Explore migration. [L3; CLO1] 02
b) Discuss the factors for rural-urban migration in the current situation. [L6; CLO3] 04
c) Evaluate the challenges of managing rapid urbanization in Bangladesh. [L3; CLO2] 04
4. a) Narrate the housing strategies for environmental friendly urbanization of Khulna City. [L5; CLO3] 05
b) Discuss the water management strategies for environmental friendly urbanization of Khulna City. [L6; CLO3] 05

Section B

There are four (04) questions in this section. Answer any three (03) questions.

5. a) Define counter urbanization and re-urbanization. [L1; CLO1] 02
b) "Urbanization is both a blessing and a challenge." Critically evaluate the statement.[L3; CLO1] 02
c) Discuss the environmental problems associated with urbanization in Bangladesh. [L2; CLO2] 06
6. a) What is meant by Urban Primacy? [L1; CLO2] 02
b) Briefly explain the different measures of urban population.[L3; CLO2] 04
c) Discuss the level and trends of urbanization in Bangladesh. [L2; CLO2] 04
7. a) How is the Urban Realm Model different from the Concentric Zone Model? [L4; CLO3] 05
b) What are the major causes of slum formation in developing countries? Explain. [L3; CLO2] 05
8. a) "Slum transformation is essential for sustainable urban development." Critically evaluate the statement. [L4; CLO3] 04
b) Explain the major factors responsible for suburbanization. [L3; CLO2] 03
c) Explain the concept of urban agglomeration with examples. [L2; CLO2] 03