Khulna University, Khulna

School: Life Science	**Discipline:** Environmental Science		**Program:** MS in Environmental Science
Year: MS 1st	**Term:** I	**Examination Year:** 2026	**Session:** 2025-2026
Course Code: 0521 10 ES 5101			**Course Title: Functional Ecology**
Total Marks: 60		**Time:** 03 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)	Ecology is not one science but a whole orchestra of sciences. Discuss with examples. [L2; CLO1]	04
	b)	How can ecosystems be considered in terms of material and energy flux? [L2; CLO2]	03
	c)	Evaluate the importance of scale while you are looking at any ecosystem. [L2; CLO3]	03
2.	a)	Define consumption effiency and production efficiency. [L1; CLO2]	02
	b)	Total energy falling in a *Marsh* is 600000 kcal/m^2/y, primary productivity (in kcal/m^2 /y) of *Spartina* accounts 6280, respiration accounts 304 kcal/m^2 /y, net primary productivity by algae accounts 27995 kcal/m^2 /y, and respiration accounts for algae is 1619kcal/m^2 /y. Calculate the photosynthetic efficiency of the marsh. [L4; CLO2]	08
3.	a)	Explain ecosystem engineers. Analyse the linkage between food web and ecosystem engineers. [L3; CLO3]	03
	b)	Evaluate how the ecological pressures shape the evolution of animal behaviours? [L4; CLO4]	03
	c)	Illustrate the summary of *Tinbergen*'s four questions of behaviour. [L4; CLO4]	04
4.	a)	Why the racial and toxic inequality happens? [L2; CLO4]	02
	b)	Explore the nature of the relationship between lead toxicity and racial composition? [L3; CLO3]	04
	c)	Illustrate the radiation effects on the ecosystem conservation. [L2; CLO4]	04

Section B

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

5.	a)	Explain invasive species. Analyze the effects of invasive species on the endemic species. [L2; CLO4]	04
	b)	Discuss the interrelationship between community participation and sustainable resource management. [L2; CLO5]	06
6.	a)	What do you mean by eco-village? Point out the basic components of an eco-village. [L1; CLO4]	03
	b)	Explain how the eco-village can be developed in different areas of Bangladesh. Give examples. [L2; CLO4]	07
7.	a)	Explain the 'ecological critical areas (ECAs)' of Bangladesh with examples. [L3; CLO5]	06
	b)	Explain the alternative livelihoods that are necessary for sustainable management of ECA's. [L5; CLO5]	04
8.	a)	How many bio-zones are there in Bangladesh? Write their names. [L1; CLO6]	02
	b)	Discuss the characteristics and importance of bio-zones. [L6; CLO6]	06
	c)	Estimate the importance of eco-tourism with examples. [L5; CLO6]	02

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School: Life Science	**Discipline:** Environmental Science	**Program:** MS in Environmental Science	
Year: MS 1st	**Term:** I	**Examination Year:** 2026	**Session:** 2025-2026
Course Code: 0521 10 ES 5103		**Course Title: Quaternary Environment**	
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 Quaternary environment in your words. [L1; CLO1]	02
	b)	Extend the effects of plate evolution during the Quaternary on atmosphere. [L2; CLO2]	04
	c)	Discuss the importance of the Quaternary in the study of Environmental Science. [L6; CLO1]	04
2.	a)	Solve the pattern of rapid climate change in the late Quaternary period. [L3; CLO2]	04
	b)	Discuss the expansion of cryosphere during the Quaternary period. [L6; CLO3]	03
	c)	Examine the chronological reconstruction of the cryosphere during the Quaternary period. [L4; CLO3]	03
3.	a)	List the Quaternary sea-level changes. [L1; CLO4]	02
	b)	Explain the Quaternary glacial-interglacial cycle with necessary figures. [L2; CLO2]	03
	c)	Build the evidence of Quaternary glaciations. [L6; CLO3]	05
4.	a)	Prove the factors influencing river environment during the Quaternary period. [L5; CLO6]	04
	b)	Explain the catchment water balance and erosional processes. [L2; CLO7]	03
	c)	Compile the various changes in water body and their effect in the Quaternary period. [L6; CLO6]	03

Section B

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

5.	a)	Why is the ice-albedo feedback a key factor governing the Earth's climate history? Justify your answer. [L4; CLO1,3,4,5]	03
	b)	Do you think studies of Quaternary environment are relevant for climate modelling? Justify your answers with examples. [L4; CLO1,3,4,5]	03
	c)	How do tectonic processes act as climate forcing? Explain with examples. [L4; CLO1,3,4,5]	04
6.	a)	Which type of proxy evidence is the fossil dune of continental interiors? How does it give clues on Quaternary environment? [L4; CLO7]	04
	b)	How is paleoenvironmental reconstruction defined? [L2; CLO1,3]	02
	c)	How are tree rings used for paleoenvironmental reconstruction? Explain with necessary figures. [L3; CLO7]	04
7.	a)	What is the Bengal delta? [L1; CLO 6]	02
	b)	Explain the Quaternary evolution of the Bengal delta. [L2; CLO6]	04
	c)	Explain the environmental variables that can be reconstructed from corals. [L3; CLO7]	04
8.	a)	Why are pollens so informative in Quaternary environment? [L4; CLO4,6]	03
	b)	Both pollens and macrofossils can show the complete representation of ancient ecosystems. Evaluate the scientific basis of this statement. [L5; CLO7]	03
	c)	Analyze the role of Quaternary environment in human migration. [L3; CLO7]	04

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School: Life Science | **Discipline:** Environmental Science | Program: MS in Environmental Science

Session: 2025-2026

Examination Year: 2026

Year: MS 1st | **Term:** I

Course Code: 0521 10 ES 5105 | **Course Title:** Environmental Management Systems and Tools

Total Marks: 60 | **Time:** 03 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) State the Environmental Management System (EMS) and tools. [L2;CLO1] 02
   b) Mention the key concepts of environmental management systems. [L6;CLO1] 04
   c) Demonstrate the importance of EMS in environmental science. [L2;CLO1] 04

2. a) How the control of environmental documentation and information follow a planned system? Explain with examples. [L1;CLO2] 05
   b) Measure the information in the environmental management systems to meet the stipulated requirements. [L5;CLO2] 05

3. a) Demonstrate the commitment to good environmental management practice by creating an environmental policy. [L2;CLO1] 05
   b) 'Environmental objectives are continuously updated'-justify the statement with examples. [L3;CLO2] 05

4. a) Build appropriate methodologies to evaluate the environmental aspects and impacts of our operations, products and services. [L6;CLO1] 05
   b) 'Environmental development areas and methods are sought out actively professionally'-justify the statement with examples. [L3;CLO2] 05

Section B

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

5. a) Define eco-management and audit scheme. [L1;CLO3] 02
   b) Apply the Plan-Do-Check-Act (PDCA) cycle to implement EMS in a textile industry in Bangladesh. [L3; CLO1] 04
   c) Evaluate the effectiveness of ISO 14001 in improving environmental performance in developing countries. [L5; CLO1] 04

6. a) Explain the steps involved in Environmental Impact Assessment (EIA). [L2; CLO2] 02
   b) Analyze the role of public participation in improving EIA outcomes. [L4; CLO2] 03
   c) Assess whether the current EIA system in Bangladesh effectively balances development and conservation. [L5; CLO2] 05

7. a) Explain the main stages of Life Cycle Assessment (LCA). [L2; CLO3] 03
   b) Analyze how LCA supports sustainable product design. [L4; CLO3]0 03
   c) Why are Life Cycle Costs (LCC) important? Propose a strategy for how a company can reduce costs by using LCC during product design. [L1, L6; CLO3] 04

8. a) Explain the importance of environmental accounting. [L2; CLO2] 02
   b) Analyze the importance of eco-labeling in sustainable consumption. [L4; CLO3] 04
   c) Develop a framework to promote eco-label adoption in Bangladesh. [L6; CLO3] 04

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School: Life Science	**Discipline:** Environmental Science		**Program:** MS in Environmental Science
Year: MS 1st	**Term:** I	**Examination Year:** 2026	**Session:** 2025-2026
Course Code: 0521 10 ES 5107			**Course Title:** Research Planning and Design
Total Marks: 60		**Time:** 03 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. Suppose you have decided to conduct research on reducing greenhouse gas emissions from solid waste dumping.
   a) Write down a possible title of your research and evaluate it in the light of four designated criteria. [L5; CLO2] 04
   b) Build the objectives of the research.[L6; CLO2] 03
   c) Generate null and alternative hypothesis. [L6; CLO2] 03

2. a) Briefly describe different steps of literature review. [L2; CLO1] 06
   b) Formulate three research questions based on your current/proposed MS thesis. Justify whether they are focused and arguable.[L6; CLO2] 04

3. a) Power point presentation is just not a reading session- Justify. [L5; CLO4] 03
   b) Illustrate the Power point presentation style of the presenter to draw audience concentration. [L2; CLO4] 03
   c) What does the fairness in peer review reflect for? Explain.[L3; CLO5] 04

4. a) Authorship in an article is not just taking the credit but also taking the responsibility as well- Justify. [L5; CLO5] 03
   b) Describe the ethical aspects of student-supervisor relationship.[L2; CLO5] 04
   c) Evaluate 'Scoupus' and 'ISI Web of Science' in journal indexing. [L5; CLO6] 03

Section B

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

5. a) Describe the procedure followed in developing a research design.[L6; CLO6] 05
   b) Explain the types of sampling procedure in environmental research.[L5; CLO3] 05

6. a) Categorize the academic research and developmental research.[L4; CLO4] 03
   b) What is multipurpose research?[L1; CLO4] 02
   c) Analyze the operational procedure of the multipurpose research.[L2; CLO4] 05

7. a) Design a research plan on the 'impact of salinity intrusion on the floral and faunal diversity in the coastal areas of Bangladesh'. [L6; CLO6] 07
   b) Research are always being influenced by the budget and timeframe. Evaluate the statement. [L5; CLO2] 03

8. Write notes on the following: [L2; CLO5, 6] 10
   a) Participatory research; b) Inception workshop;
   c) ANOVA table; d) Annotated bibliography

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School: Life Science	**Discipline:** Environmental Science	**Program:** MS in Environmental Science	
Year: MS 1st	**Term:** I	**Examination Year:** 2026	**Session:** 2025-2026
Course Code: 0521 10 ES 5113		**Course Title:** Resource Evaluation and Wetland 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 wetlands. [L1;CLO2]	02
	b)	Where are wetlands typically formed? Explain with schematic diagrams. [L2;CLO1,2]	03
	c)	Discuss and differentiate between swamp, marsh, fen and bog with suitable examples. [L5;CLO1,2]	05
2.	a)	What is meant by wetland degradation? [L1;CLO1,2,3]	02
	b)	Analyze the major drivers of wetland degradation in Bangladesh. [L4;CLO1,2,3]	04
	c)	'Wetland degradation is primarily a governance failure.' Discuss this statement in the contemporary context of the Mayur River in Khulna. [L3;CLO1,2,3]	04
3.	a)	List the major types of ecosystem services provided by wetlands. [L1;CLO1,2]	02
	b)	Discuss how degradation of wetlands affects ecosystem services delivery. [L4;CLO1,3]	04
	c)	Analyze the conflict between development and conservation of wetland ecosystem services in Bangladesh. [L4;CLO1,2,3]	04
4.	a)	What do you mean by the total value of wetlands? [L1;CLO1,2]	02
	b)	Explain the difference between use value and non-use value. [L2;CLO1,2]	03
	c)	'The total value of wetlands is far greater than their market values.' Discuss this statement with reference to the Sundarbans ecosystems in Bangladesh. [L5;CLO1,2,3]	05

Section B

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

5.	a)	Discuss the current status and issues of wetlands of Bangladesh. [L6;CLO2]	07
	b)	Judge the conflicts between agricultural extension and natural wetlands management. [L5;CLO3]	03
6.	a)	Define wetland policy. [L1;CLO2]	02
	b)	Analyze the existing national and international wetland policies regarding management. [L4;CLO3]	08
7.	a)	Illustrate the wetland inventory. [L2;CLO2]	02
	b)	Formulate the necessity of inventory of natural wetlands in Bangladesh. [L6;CLO2]	04
	c)	Develop a guideline for the inventory of wetlands in Bangladesh. [L6;CLO3]	04
8.	a)	Justify the importance of societal involvement of peripheral people in wetland management in Bangladesh. [L5;CLO3]	05
	b)	Relate how livelihoods can be influenced by the wetlands. [L2;CLO3]	05

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School: Life Science	**Discipline:** Environmental Science		**Program:** MS in Environmental Science
Year: MS 1st	**Term:** I	**Examination Year:** 2026	**Session:** 2025-2026
Course Code: 0731 10 URP 5111			**Course Title:** Applied Geoinformatics
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)	What do you mean by Geoinformatics? [L1;CLO1]	02
	b)	Explain the various stages of Remote Sensing. [L2;CLO1]	04
	c)	Discuss the necessity of Geoinformatics for environmental resource management. [L6;CLO3]	04
2.	a)	Explore GPS? [L1;CLO2]	02
	b)	Discuss the uses of GPS in various sectors. [L6;CLO2]	04
	c)	Evaluate the necessity of GPS for GIS mobile mapping. [L5;CLO2]	04
3.	a)	What are airborne and space-borne sensor systems? [L1;CLO1, 3]	02
	b)	How can digital photogrammetry be used for urban 3D modeling? [L3;CLO1,3]	04
	c)	Compare digital photogrammetry and traditional photogrammetry methods. [L4;CLO1,3]	04
4.		Solve the short notes on the following. [L3;CLO1] a) Digital data and format; b) Platforms; c) Aerial Photo; and d) Electromagnetic spectrum.	10

Section B

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

5.	a)	Differentiate between map projection and reprojection. [L2;CLO1,2]	03
	b)	Why are map projections necessary in cartography and GIS? [L1;CLO1,2]	03
	c)	Explain how cylindrical map projections are constructed. [L6;CLO1,2]	04
6.	a)	Explain the advantages and disadvantages of vector and raster-based GIS. [L2;CLO2]	05
	b)	Evaluate the various data models in GIS. [L5;CLO2]	05
7.	a)	Define spatial interpolation. [L1;CLO1,2]	02
	b)	Write the basic assumption of spatial interpolation. [L2;CLO1,2]	03
	c)	Briefly describe the basic elements of spatial interpolation. [L2;CLO1,2]	05
8.	a)	What is a decision support system? [L1;CLO1,2]	02
	b)	Discuss the key components of a decision support system. [L2;CLO1,2]	04
	c)	Compare model-driven and data-driven decision support systems. [L5;CLO1,2]	04

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School: Life Science	**Discipline:** Environmental Science		**Program:** MS in Environmental Science
Year: MS 1st	**Term:** I	**Examination Year:** 2026	**Session:** 2025-2026
Course Code: 0521 10 ES 5115		**Course Title:** Climate Change Resilient Development	
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 climate change resilience, adaptation, and vulnerability. How are these concepts interrelated?[L2; CLO1]	03
	b)	Explain the concept of everyday resilience with suitable real-life examples from communities.[L1; CLO1]	03
	c)	Discuss the importance of understanding resilience across different disciplines (environmental, social, economic, and engineering).[L2; CLO1]	04
2.	a)	Discuss the major tools and methods used for resilience assessment and planning.[L5; CLO2]	04
	b)	Explain the role of early warning systems, early action, and climate risk insurance in reducing climate-related impacts.[L2; CLO2]	03
	c)	Discuss the importance of community-based climate change adaptation (CBCCA) in developing countries with reference to Bangladesh.[L1; CLO2]	03
3.	a)	Explain adaptation measures for extreme weather events, floods, sea level rise, and heat waves.[L1; CLO2]	04
	b)	Discuss climate adaptation strategies in different ecosystems such as coastal, aquatic, dryland, and mountain ecosystems.[L2; CLO2]	03
	c)	Why is ecosystem-based adaptation (EbA) considered an effective climate resilience strategy?[L4; CLO2]	03
4.	a)	Analyze adaptive capacity in development planning. [L4; CLO3]	03
	b)	Evaluate the role of policy in enhancing resilience. [L5; CLO3]	03
	c)	Create a policy framework that integrates adaptation actions for both sea-level rise and flooding in delta regions. [L6; CLO3]	04

Section B

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

5.	a)	What is the relief-to-development continuum?[L1; CLO5]	02
	b)	Explain the three types of resilience capacity-absorptive coping capacity, adaptive capacity, and transformative capacity with simple examples.[L2; CLO4]	04
	c)	Explain the role of Tidal River Management (TRM) in building climate resilience in Bangladesh.[L4; CLO3]	04
6.	a)	Explain the concept of environmental justice in climate resilience. [L2; CLO4]	02
	b)	Demonstrate how everyday resilience strategies can be integrated into a local climate action plan. [L4; CLO1]	04
	c)	Design a participatory adaptation plan for a cyclone-prone coastal community. [L6; CLO5]	04

[P.T.O]

7. a) Describe key climate-smart agriculture (CSA) practices used in Bangladesh. [L2; CLO7] 03
   b) Discuss how CSA contributes to both adaptation and mitigation. [L3; CLO7] 03
   c) Design a CSA-based livelihood model for a saline-prone coastal region. [L6; CLO7] 04

8. a) Identify major challenges of urban resilience in Bangladesh. [L2; CLO7] 02
   b) Evaluate the role of green infrastructure in building urban resilience. [L5; CLO7] 04
   c) Design an integrated rural-urban resilience strategy combining CSA and urban planning. [L6; CLO7] 04

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School: Life Science	**Discipline:** Environmental Science		**Program:** MS in Environmental Science
Year: MS 1st	**Term:** I	**Examination Year:** 2026	**Session:** 2025-2026
Course Code: 0521 10 ES 5117		**Course Title:** Globalization, Environmental Policy and Negotiation	
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 global sustainability and explain its key dimensions. [L2; CLO1]	03
	b)	"Climate change is the greatest threat to global sustainability." Evaluate with recent examples. [L5; CLO3]	03
	c)	Critically analyze the relationship between globalization and environmental sustainability using suitable examples. [L5; CLO2]	04
2.	a)	"Global warming is not a prediction; it is happening right now". Evaluate with present incidents. [L5; CLO3]	03
	b)	Critically explore how globalization influences environmental justice and inequality across nations. [L6; CLO5]	03
	c)	Demonstrate the role of Environmental Impact Assessment (EIA) in achieving Sustainable Development Goals (SDGs) in Bangladesh. [L6; CLO5]	04
3.	a)	Explain the concept of transboundary pollution with examples. [L2; CLO3]	03
	b)	Illustrate the processes of globalization and discuss the key constraints to the effective implementation of Environmental Policy. [L3; CLO5]	03
	c)	Demonstrate the key constraints in implementing environmental policies in developing countries. [L3; CLO5]	04
4.	a)	Identify key causes of environmental degradation linked to globalization. [L3; CLO2]	03
	b)	Do you think international cooperation is sufficient to solve global environmental problems? Justify with examples. [L6; CLO7]	03
	c)	Evaluate the role of global environmental governance in promoting green politics and environmental justice. [L6; CLO7]	04

Section B

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

5.	a)	What is meant by environmental policy?[L2; CLO4]	02
	b)	Enlist four examples of environmental policies of Bangladesh.[L1; CLO4]	02
	c)	Explain the background and objectives of National Environment Policy 2018 of Bangladesh.[L2; CLO4]	06
6.	a)	Environmental policy makers are to be successful environmental problem solvers. Justify the statement with an example.[L4; CLO4]	03
	b)	Environmental policies are a colorful mixture of environmental regulations and instruments. Explain the statement with examples.[L4; CLO4]	03
	c)	Is there any relation between environmental policy and sustainable development? Justify your answers with examples. [L5; CLO5]	04

[P.T.O]

7.	a)	Analyze a comparative analysis of a Bangladeshi environmental policy with that of a developed country.[L4; CLO6]	05
	b)	Explain the steps for policy analysis process.[L2; CLO6]	05
8.	a)	What is climate market?[L2; CLO6,7]	02
	b)	Do you think the present fuel crisis in the world can reshape the global climate market? Justify your answers.[L5; CLO6,7]	04
	c)	What is COP30? Write its background and objectives.[L2; CLO6,7]	04