



Khulna University, Khulna

School: Life Science School **Discipline:** Environmental Science

Program: BSc (Hon's) in
Environmental Science

Year: 2nd

Term: I

Examination Year: 2026

Session: 2024-2025

Course Code: 0521 10 ES 2103

Course Title: Hydrology

Total Marks: 60

Time: 3 Hours

Credit: 3

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 and classify Hydrology. [L2, CLO1] 02
 - b) Explain the application of hydrology in environmental sector. [L2; CLO1] 03
 - c) What are the basic hydrologic data required for design of a hydrologic project? [L1; CLO1] 02
 - d) Briefly describe the hydrological cycle with diagram. [L2, CLO1] 03
2.
 - a) What is open channel flow? How does it differ from pipe flow? [L1,2; CLO2] 02
 - b) Classify and discuss different types of open channel flow on the basis of Reynold's number and Froude number. [L2,6; CLO2] 04
 - c) Explain Manning's equation and Chezy's equation for discharge computations. [L6; CLO2] 04
3.
 - a) What is Hydrograph and unit Hydrograph? Illustrate the components of a hydrograph. [L1; CLO2] 04
 - b) Elaborate Horton's law for overland flow and infiltration capacity. [L6; CLO2] 03
 - c) What is 'Infiltration Index'? Explain the types of infiltration index. [L1,2; CLO2] 03
4.
 - a) Define and classify stream. [L2; CLO2] 03
 - b) What is discharge? Elaborate the Area-velocity method to estimate the discharge in a stream. [L1,6;CLO2] 04
 - c) Assess the role of evapotranspiration in water resource planning. [L2; CLO4] 03

Section B

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

5. a) What do you mean by groundwater hydrology? [L1; CLO3] 02
b) Discuss how rock properties such as porosity and permeability effect groundwater movement. [L2; CLO4] 04
c) Analyze the importance of groundwater in Bangladesh. [L4; CLO3,4] 04
6. a) Differentiate aquifer and aquitards. [L2; CLO3] 02
b) Illustrate a conceptual diagram showing different types of aquifers. [L2; CLO3] 04
c) A water sample extracted from an irrigation well had a ^3H concentration of 10 TU. The $^3\text{He}/^4\text{He}$ ratio of dissolved helium was also measured, and after correcting for helium due to other sources, the ^3He concentration due to decay of ^3H termed tritiogenic ^3He concentration) was estimated to be 5 TU. Calculate the apparent age of groundwater sample. The decay constant for ^3H is 0.0558 year^{-1} . [L3,6; CLO4,5] 04
7. a) What is hydraulic conductivity? [L1; CLO3,4] 02
b) Derive expression of equivalent horizontal and vertical hydraulic conductivity of a stratified aquifer system. [L4; CLO3,4] 04
c) An unconfined aquifer consists of three horizontal layers, each individually isotropic. The top layer has a thickness of 10 m and a hydraulic conductivity of 11.6 m/day. The middle layer has a thickness of 4.4 m and a hydraulic conductivity of 4.5 m/day. The bottom layer as a thickness of 6.2 m and a hydraulic conductivity of 2.2 m/day. Compute the equivalent horizontal and vertical hydraulic conductivities. [L3,6; CLO4,5] 04
8. a) What is meant by a dug well? [L1; CLO3,4] 02
b) Explain the construction processes of a dug well with a neat labeled diagram. [L2; CLO3] 05
c) Assess the health risks associated with poorly maintained dug well. [L5; CLO3,5] 03



Khulna University, Khulna

School: Life Science
School

Discipline: Environmental Science

Program: BSc (Hon's) in
Environmental Science

Year: 2nd

Term: I

Examination Year: 2026

Session: 2024-2025

Course Code: 0521 10 ES 2105

Course Title: Environmental Chemistry

Total Marks: 60

Time: 3 Hours

Credit: 3

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 environmental chemistry. [L1; CLO1] 02
 - b) How can environmental scientists apply the knowledge of environmental chemistry in their professional life? Explain with examples. [L3; CLO1] 04
 - c) Explain the elemental composition of the meteorites. [L2,4; CLO1] 04
2.
 - a) Discuss the contribution of atmosphere in biogeochemical cycling. [L2,4; CLO3] 03
 - b) Why did the chemical evolution and distribution of the earth's elements undergo various stages over geologic times? [L4; CLO2] 02
 - c) Point out the significance of the presence of water vapor in the atmosphere. . [L2,4; CLO3] 02
 - d) What are the methods available for determining the chemical composition of the upper earth's crust? Which method is mostly used in determining the composition of the upper crust and why? [L2; CLO2] 03
3.
 - a) Why is thermodynamics related to the geochemical system of natural water? Explain with examples. [L4; CLO4] 04
 - b) Explain the significance of the ocean's chemical compositions. [L2; CLO4] 03
 - c) How does nature of the bedrock control the chemical composition of terrestrial water? Explain with examples. [L2; CLO4] 03
4.
 - a) Explain the atmospheric ozone formation and destruction process. [L2; CLO3] 03
 - b) Do you think ozone can form in the troposphere? Argue your answer. [L5; CLO3] 02
 - c) Enlist the atmospheric additions during geological time. [L2; CLO3] 03
 - d) Why is nitrogen the most abundant constituent in the atmosphere? Explain with reference to geochemical systems. [L5; CLO3] 02

Section B

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

- | | | | |
|----|----|--|-------|
| 5. | a) | Write the influences of biosphere in earth chemistry. [L1,2; CLO5] | 02 |
| | b) | Write the mass of biosphere. Discuss the difficulties in estimation the mass of biosphere. [L1,4; CLO5] | 04 |
| | c) | 'The zone of biosphere is of great activity'-explain. [L1,2; CLO5] | 04 |
| 6. | a) | Define biodegradation. Illustrate the types of biodegradation with examples. [L2; CLO7] | 02 |
| | b) | Write down the types of reactions mediated by bacteria in transformation of organic materials. [L1; CLO7] | 04 |
| | c) | What are the general rules useful for understanding the fate of organic compounds and their treatments? [L4; CLO7] | 04 |
| 7. | a) | Define pesticides with classifications. [L1,2; CLO6] | 03 |
| | b) | Discuss the types of synthetic organic pesticides. [L1,4; CLO6] | 04 |
| | c) | Describe the environmental impacts of pesticides. [L2,5; CLO6] | 03 |
| 8. | | Write short notes on the followings: | 2.5*4 |
| | a) | Combustible Bioliths; | |
| | b) | Hilt's Rule | |
| | c) | Sewage water composition | |
| | d) | Surfactant pollution | |



Program: BSc (Hon's) in Environmental Science

Credit: 3

- | | | |
|----|---|-------|
| 5. | a) What is synecology? [L1;CLO1] | 02 |
| | b) Predict the relationship between synecology and environment. [L6;CLO2] | 02 |
| | c) Discuss the factors which are responsible for developing a community. [L6;CLO3] | 06 |
| 6. | a) Define sere. Select the different types of sere. [L1;CLO2] | 03 |
| | b) How a climax community can be developed in the wetland area- describe the stages. [L1;CLO3] | 07 |
| 7. | a) What do you mean by succession? [L1;CLO3] | 01 |
| | b) Illustrate the causes and type of succession. [L2;CLO4] | 04 |
| | c) How can you find out the important value index of a species? Draw a phytograph by using IVI. [L1;CLO4] | 05 |
| 8. | Write short notes on the followings: [L1,2,3,4,5,6;CLO2,3,4] | 2.5*4 |
| | a) Ecotone; | |
| | b) Foliage lichen stage | |
| | c) Semi-evergreen forest; | |
| | d) Similarity and dissimilarity index | |



Khulna University, Khulna

School: Life Science

Discipline: Environmental Science

Program: BSc (Hon's) in
Environmental Science

Year: 2nd

Term: I

Examination Year: 2026

Session: 2024-2025

Course Code: 0521 10 ES 2113

Course Title: Biodiversity

Total Marks: 60

Time: 3 Hours

Credit: 3

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) Explain biodiversity with hierarchical classification. [L1; CLO1] 04
 - b) Why should we care about biodiversity? Explain with example. [L2; CLO2] 03
 - c) Illustrate how biodiversity and ecosystem functioning linked. [L4; CLO1] 03
2.
 - a) Who is Mendel? Why is heredity matter? [L3; CLO2] 03
 - b) Evaluate the importance of pea in heredity experiment. [L5; CLO2] 03
 - c) Discuss the conservation of biodiversity and the future of humankind in the light of the Legacy of Mendel. [L4; CLO2] 04
3.
 - a) Elaborate the anthropogenic causes of biodiversity loss with example. [L3; CLO3] 04
 - b) Define speciation. [L3; CLO2] 01
 - c) 'The community behaves in a frustrated fashion'- Justify the statement. [L3; CLO2] 02
 - d) How diversity is related with niche structure? Explain trophic diversity. [L4; CLO2] 03
4.
 - a) List the ecological interactions that make ecosystem work. [L2; CLO2] 02
 - b) Analyse the major drivers of biodiversity endangerment. [L4; CLO3] 04
 - c) Illustrate the actions should be taken in local level for conserving local diversity. [L5; CLO2] 04

Section B

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

5.
 - a) What do you mean by CBD? [L1;CLO3] 02
 - b) Elaborate the major objectives of CBD with explanations. [L6;CLO3] 06
 - c) Why is CBD necessary for a developing country? [L1;CLO4] 02
6.
 - a) Define IPRs? Why are IPRs important for Bangladesh? [L1;CLO3] 04
 - b) Distinguish how can you implement IPRs in your country? [L4;CLO3] 04
 - c) Explain the function of WTO? [L2;CLO3] 02
7.
 - a) What is 'Geographical Indication'? [L5;CLO4] 02
 - b) Discuss the procedure to conserve the floral diversity of Bangladesh. [L6;CLO4] 06
 - c) Identify the name of four threatened species in our country. [L3;CLO3] 02
8. Write short notes on the followings: [L2,3,4,5;CLO3,4] 2.5*4
 - (a) Relax of CBD; (b) Living fossil
 - (c) Farmer rights; (d) Endemic species



Khulna University, Khulna

School: Life Science School	Discipline: Environmental Science	Program: BSc (Hon's) in Environmental Science
Year: 2 nd	Term: I	Examination Year: 2026
Course Code: 0521 10 ES 2115		Session: 2024-2025
Total Marks: 60	Time: 3 Hours	Credit: 3

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) "Biochemistry is the molecular foundation of environmental science." - Justify [L1; CLO1] 03
 - b) Demonstrate the principles of biochemistry. [L2; CLO2] 03
 - c) Evaluate the role of environmental chemists in studying pollutant pathways and their ecological impacts. [L6; CLO1] 04
2.
 - a) Define proteins and essential amino acids. [L1; CLO2] 02
 - b) "Animal proteins are complete, but plant proteins are not" – Justify [L3; CLO2] 02
 - c) Differentiate between physical and chemical properties of proteins with examples. [L4; CLO2] 03
 - d) What causes high cholesterol? Elaborate on the term "You need a little, not a lot". [L6, CLO3] 03
3.
 - a) Define carbohydrates and classify them. [L1; CLO2] 02
 - b) Explain the physical and chemical properties of carbohydrates. [L2; CLO3] 02
 - c) Mention the functions and components of DNA and RNA. [L3, CLO3] 03
 - d) Write down the biological importance of nucleic acids. [L5; CLO3] 03
4.
 - a) How can you differentiate enzymes from hormones? [L2, CLO4] 02
 - b) Why is enzyme specificity an important criterion of an enzyme action? Justify and explain with examples. [L3, CLO5] 03
 - c) What are the factors that modify or influence the enzyme activities? [L6; CLO5] 05

Section B

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

- | | | | |
|----|----|--|-------|
| 5. | a) | Explain xenobiotic metabolism with its significance in studying Environmental Biochemistry. [L1,2; CLO 5,6] | 04 |
| | b) | Classify the reactions in xenobiotic metabolism? [L1,2; CLO 5,6] | 04 |
| | c) | What is meant by xenobiotic response elements? [L2; CLO 5,6] | 02 |
| 6. | a) | What is Cytochrome P ₄₅₀ (CYP)? Elucidate the functions of CYP. [L1,4; CLO 5,6] | 04 |
| | b) | Illustrate the nomenclature method of CYP. [L2,3; CLO 5,6] | 04 |
| | c) | Hydroxilation is not always detoxification- explain. [L4,5; CLO 5,6] | 02 |
| 7. | a) | What is superoxide? Why superoxide is not xenobiotic? [L1,2; CLO 5,6] | 03 |
| | b) | Write the chemical properties and toxicity of superoxide. [L1,2; CLO 5,6] | 03 |
| | c) | What is superoxide dismutase (SOD)? Write the types and respective roles of SOD. [L1,2; CLO5,6] | 04 |
| 8. | | Write short notes of the followings [L1-5; CLO 2,5,6] | 2.5*4 |
| | a) | Risk groups of vitamin deficiencies | |
| | b) | Dilemma in minerals | |
| | c) | Chromium Toxicity | |
| | d) | Monooxygenase | |



Khulna University, Khulna

School: Life Science School	Discipline: Environmental Science	Program: BSc (Hon's) in Environmental Science
Year: 2 nd	Term: I	Examination Year: 2026
Course Code: 0310 10 Econ 2181	Course Title: Economics	Session: 2024-2025
Total Marks: 60	Time: 3 Hours	Credit: 3

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 economics? [L1;CLO1] 02
b) How do the economic activities affect environmental quality? Explain based on the relationship between economics and environment. [L2;CLO1] 04
c) Graphically explain the market equilibrium. [L4;CLO3] 04
2. a) What are the basic problems in economics? [L3;CLO2] 02
b) Explain how these problems are solved in economics. [L4;CLO2,3] 08
3. a) What is demand function and supply function? [L1;CLO2] 03
b) How market equilibrium attained by the interaction of demand and supply curve? [L4;CLO3] 07
4. a) What is production? What are the factors of productions? [L1;CLO2,3] 02
b) Graphically explain the stages of production. [L5;CLO2,3] 08

Section B

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

5. a) How can we differ GNP from GDP? [L3;CLO3] 03
b) Describe various methods of counting National Income. [L2;CLO1,2,3] 07
6. a) Give your idea about Nominal GNP and Real GNP. [L3;CLO1,2,3] 04
b) How can we get Disposable Income (DI) from National Income (NI)? [L4;CLO3,4] 06
7. a) What is transfer payment? [L2;CLO2] 03
b) Explain the circular flow of income. [L2;CLO3] 07
8. a) Write down about aggregate demand and aggregate supply. [L2;CLO2,4] 03
b) Describe the characteristics of under-developed countries. [L4;CLO4] 07



Khulna University, Khulna

School: Life Science School **Discipline:** Environmental Science

Program: BSc (Hon's) in
Environmental Science

Year: 2nd

Term: I

Examination Year: 2026

Session: 2024-2025

Course Code: 0314 10 Soc-2188 2183

Course Title: Sociology

Total Marks: 60

Time: 3 Hours

Credit: 3

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 Sociology? [L1, CLO1] 03
b) Discuss the importance of studying sociology in relation environment and ecology. [L1, CLO1,2] 07
2. a) What is society? [L1, CLO1,2] 04
b) Distinguish between association and institution. [L4, CLO1,2] 06
3. a) 'Culture is what we are and civilization is what we have'-justify your answer. [L3, CLO4] 04
b) Differentiate between culture and civilization. [L4, CLO4] 06
4. a) What are the types of social mobility? [L1, CLO2,3] 04
b) Illustrate the determinants of social inequality. [L2, CLO2,3] 06

Section B

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

5. a) How does urbanization impact on social change? Explain in the context of Bangladesh with citing examples. [L5, CLO2,3] 10
6. a) What do you understand by mass media? [L1, CLO2] 03
b) Critically analyze the functionalist perspective of media. [L4, CLO3] 07
7. a) Differentiate between crime and deviance. [L4, CLO2] 04
b) Interpret the social strain theory of deviance. [L2, CLO2] 06
8. a) Elaborately discuss the Malthusian theory of population. [L6, CLO4] 10