

Khulna University

School: Life Science

Discipline: Environmental Science

Program: BSc

Year: First

Term: 2nd

Examination Year: 2026

Session: 2024-2025

Course Code: 0521 10ES 1203

Course Title: Physical Environment II

Total Marks: 60

Time: 03 Hours

Credit: 02

Section A

There are 4 (four) questions in this section. Answer any 3 (three) questions

Question No.	Question Description	Marks
1.	a) Illustrate the major physical characteristics of the subcontinent. [L2;CLO1] b) Discuss the geo-environmental issues of the Indian subcontinent with examples. [L6;CLO2]	05 05
2.	a) Elaborate the Himalayan flood plains of the range. [L2;CLO2] b) Explain in details the physical environment of the Bengal Basin. [L2;CLO3]	05 05
3.	a) List the different sources of river. [L4;CLO3] b) Explain the Ganges river basin of the subcontinent. [L2;CLO2] c) Compile the physical issues and livelihood of the Amazon. [L6;CLO1]	02 04 04
4.	Solve the short notes on the following: [L3;CLO3] a) Deltaic areas; b) Mountain range; c) The Indus river basins; d) Physical attributes.	10

Section B

There are 4 (four) questions in this section. Answer any 3 (three) questions.

Question No.	Question Description	Marks
5.	a) What is meant by geoenvironment of Bangladesh? [L1;CLO2] b) Why is Bangladesh's climate markedly seasonal? [L1;CLO2] c) Why do the monsoonal length of Bangladesh increase from west to east? [L1;CLO2] d) Analyze why the Brahmaputra and the Meghna typically reach their peak water discharges in July/August, but the Ganges reaches its peak level usually about a month later? [L4;CLO2]	02 03 02 03
6.	a) Draw the Bengal Basin map with surrounding geological elements. [L2;CLO3] b) What do you mean by physiography? [L1;CLO2] c) Explain the physical features of the following physiographic regions of Bangladesh by showing in a map: Madhupur tract, Barind tract. [L2;CLO2]	04 01 05
7.	a) Write the stratigraphy of stable platform of Bangladesh in a table. [L1;CLO4] b) Why was the Kopili shale stratigraphic unit deposited in Bangladesh? [L1;CLO4] c) Why did the Dihing stratigraphic unit deposit a wide grain size sediment in Bangladesh? [L1;CLO4]	05 03 02
8.	a) Why is hinge zone of Bangladesh geologically a tectonic feature? Justify your answer. [L1,5;CLO3] b) Explain the tectonic elements of the geosynclinal area of Bangladesh. [L2;CLO3] c) Explain the mineral resources found in Bangladesh by showing in a map. [L2;CLO5]	03 03 04

Khulna University

School: Life Science
Year: First
Course Code: 0521 10ES 1211
Total Marks: 60

Discipline: Environmental Science
Term: 2nd
Examination Year: 2026
Course Title: Biological Environment II
Credit: 02

Program: BSc
Session: 2024-2025
Credit: 02

Section A

There are 4 (four) questions in this section. Answer any 3 (three) questions

Question No.	Question Description [*Level (L1-L6); CLO No.]	Marks
1.	a) Classify bacteria on the basis of its shape, temperature and oxygen requirement. [L2,5;CLO1]	04
	b) Fungi are found as mold and yeast –characterize. Write notes on the importance of fungi in the production of agriculture. [L1,4;CLO1]	03
	c) Define Protista. Classify Actinopoda upto class with an example. [L1,2;CLO1]	03
2.	a) Canal system functioning for different physiological activities in sponges –explain. Draw and label a schematic diagram of sycon type complex canal system in Sponge. [L1,2;CLO2]	05
	b) Coral reef formed by Cnidarian animal which are different types found in the world - discuss. [L2,6;CLO2]	05
3.	a) Define instar and molting. Illustrate the process of ecdysis in crustacean animal. [L1,2;CLO2]	03
	b) Show the life cycle of <i>Schistosoma</i> and <i>Ancylostoma</i> . Give an account of parasitic adaptation of <i>Ascaris</i> in animal gut. [L1,2;CLO2]	07
4.	a) Swim-bladder in Pisces and Air-bladder in Aves are functionally alike. – Justify. Draw and label the air-sac found in aves. [L1,5;CLO3]	05
	b) Briefly discuss the functional role play by air-sac during the avian flight. [L6;CLO3]	05

Section B

There are 4 (four) questions in this section. Answer any 3 (three) questions.

Question No.	Question Description [*Level (L1-L6); CLO No.]	Marks
5.	a) Estimate the major role of green plants in environment. [L5;CLO3]	03
	b) Discuss the special characteristics of hydrophytes with illustration. [L6;CLO1,2]	05
	c) What do you mean by 'halophytes'? [L1;CLO1]	02
6.	a) Explain the environmental factors, which can control the plants growth and physiology. [L6;CLO1]	06
	b) Illustrate seed dormancy with causes. [L2;CLO1]	02
	c) Outline the deficiency symptoms of nitrogen and zinc. [L2;CLO1]	02
7.	a) Discuss the multiplication procedure of plants with figures. [L6;CLO1,2]	07
	b) List the name of oil, medicine and timber plant one each with parts of uses. [L4;CLO3]	03
8.	Write short notes on the following: [L1;CLO1,2,3] a) Xerophytes; b) <i>Azolla pinnata</i> ; c) C ₃ and C ₄ plants; d) Floral diagram of Malvaceae family.	10

Khulna University

School: Life Science
Year: First
Course Code: 0521 10ES 1213
Total Marks: 60

Discipline: Environmental Science
Term: 2nd
Examination Year: 2026
Course Title: Environmental Microbiology
Credit: 03

Program: BSc
Session: 2024-2025
Credit: 03

Section A

There are 4 (four) questions in this section. Answer any 3 (three) questions

Question No.	Question Description [*Level (L1-L6); CLO No.]	Marks
1.	a) Define Environmental Microbiology and explain its applications in Environmental Science. [L1, 2; CLO1]	04
	b) List the antigenic characteristics of microorganisms. [L1; CLO4]	03
	c) Illustrate the mechanism of pathogenicity of microorganisms. [L2; CLO6]	03
2.	a) Briefly describe the competitive exclusion principle in competition. Write down its significance. [L2; CLO1]	04
	b) Which one of the following is better for ecosystem sustainability- synergism or mutualism? Argue your answer. [L5; CLO1]	04
	c) In microbial world it is often difficult to differentiate between parasitism and predation. Justify. [L5; CLO1]	02
3.	a) Suppose, the number of microorganisms in 1 gm rhizosphere soil is 220 and in 2 gm surrounding root free soil is 35. Calculate R/S ratio. [L4; CLO3]	04
	b) Differentiate between <i>Azorhizobium</i> and <i>Rhizobium</i> in the context of nitrogen fixation. [L4; CLO3]	02
	c) Describe the factors governing susceptibility/ resistance in host-parasite relationship leading disease/ health. [L2; CLO2]	04
4.	a) Point out the reservoir of ebola, dengue and HIV viruses. [L1; CLO8]	02
	b) Identify the sources of microorganisms in atmosphere. [L3; CLO6]	03
	c) Design a typical pathway of ocean carbon sequestration indicating the role of microbes. [L6; CLO11]	05

Section B

There are 4 (four) questions in this section. Answer any 3 (three) questions.

Question No.	Question Description [*Level (L1-L6); CLO No.]	Marks
5.	a) Critically discuss the effectiveness of high-temperature food preservation techniques in ensuring food safety and shelf life. [L5; CLO10]	04
	b) Describe the impact of temperature and salinity on microbial growth. [L5; CLO1]	06
6.	a) Illustrate the sulphur cycle identifying the role of specific microorganisms in various steps. [L2; CLO3]	05
	b) Microbes play a dynamic role in plant growth – justify. [L5; CLO3]	05
7.	a) Define and classify microbes based on O ₂ content. [L1,2; CLO1]	03
	b) Briefly explain the phases of bacterial growth with schematic diagram. [L2; CLO1]	03
	c) How do abiotic factors affect microbial growth? Explain. [L3; CLO2]	04
8.	a) Why we use microbe as a source of food? [L2; CLO5]	02
	b) Why fresh milk is considered as an excellent medium for bacteriological growth? [L3; CLO5]	02
	c) Compare different biological wastewater treatment processes with suitable schematic diagrams. [L5; CLO12]	06

Khulna University

School: Life Science

Year: First

Course Code: 0533 10Phy 1271

Total Marks: 60

Discipline: Environmental Science

Term: 2nd

Time: 03 Hours

Program: BSc

Session: 2024-2025

Examination Year: 2026
Course Title: Physics in Environmental Science

Credit: 03

Section A

There are 4 (four) questions in this section. Answer any 3 (three) questions

Question No.	Question Description	Marks
1.	a) Write down the scopes of Physics in Environmental Science. [L1; CLO1]	03
	b) State and explain surface tension of liquid with proper example. [L2; CLO1]	03
	c) Show that surface tension is equal to surface energy of a liquid surface. [L2; CLO1]	04
2.	a) Illustrate equation of continuity in case of fluid motion. [L2; CLO2]	03
	b) Derive the Poiseuille's equation: $\eta = \frac{\pi PR^4}{8VL}$ where, the symbols have their usual meaning. [L3; CLO4]	07
3.	a) Explain how the viscosity changes with temperature. [L2; CLO2]	03
	b) Distinguish between stream line flow and turbulent flow of liquid. [L4; CLO2]	04
	c) An air bubble of radius 0.1 mm is situated just below the surface of water, calculate the gauge pressure or excess pressure inside the air bubble, surface tension of water is 7.2×10^{-2} N/m. [L5; CLO2]	03
4.	a) The mean free path of the molecule of a gas is 8×10^{-8} m and the radius of a molecule is 1.5×10^{-10} m. Estimate the number of molecules per m^3 . [L5; CLO2]	03
	b) Mathematically deduce the expression for surface tension in a capillary tube immersed in water. [L5; CLO1]	07

Section B

There are 4 (four) questions in this section. Answer any 3 (three) questions.

Question No.	Question Description	Marks
5.	a) Define Absorptivity and Emissivity. [L1; CLO2]	03
	b) Deduce the Fourier's differential equation of rectilinear flow of heat along a bar of uniform area of cross-section. [L5; CLO2]	04
	c) The opposite faces of a metal plate of 0.2 cm thickness are at difference of temperature of 100°C and the area of the plate is 200 cm^2 . If the coefficient of thermal conductivity is 0.2 CGS unit, then find the quantity of heat that will flow through the plate in one minute. [L1; CLO3]	03
6.	a) What is black body radiation? Explain 'ventilation' by convection process of heat flow. [L1,2; CLO2]	04
	b) Define emissive power and absorptive power of a body. [L1; CLO4]	03
	c) State and explain the Stefan-Boltzmann's law of heat radiation. [L1,2; CLO2]	03
7.	a) State and explain 1 st and 2 nd law of thermodynamics. [L1,2; CLO4]	04
	b) What is entropy? Show that the change of entropy of n mole of a perfect gas is $S_2 - S_1 = n \left(C_v \ln \frac{T_2}{T_1} + R \ln \frac{V_2}{V_1} \right)$ where, the symbols have their usual meanings. [L1; CLO3]	04
	c) Calculate the increase in entropy of 2 gm of O_2 when its temperature is raised from 20°C to 100°C and its volume is doubled. [$C_v = 25.5 \text{ Jmol}^{-1} \text{ K}^{-1}$ and $R = 8.31 \text{ Jmol}^{-1} \text{ K}^{-1}$]. [L5; CLO4]	02
8.	a) What is meant by coefficient of thermal conductivity? [L1; CLO3]	02
	b) What is reversible process? Prove that, $\eta = 1 - \frac{T_2}{T_1}$ where, the symbols have their usual meanings. [L1; CLO4]	06
	c) Find the efficiency of the Carnot's engine working between the steam point and the ice point. [L1; CLO3]	02