R4523

Sub. Code
25MOC2C1

M.Sc. DEGREE EXAMINATION, APRIL – 2026

Second Semester

Oceanography and Coastal Area Studies

MARINE ECOLOGY

(CBCS – 2025 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** the questions by choosing the correct option.

1. Which zone of the ocean receives sufficient light for photosynthesis? (CO1, K2)

   (a) Aphotic zone

   (b) Bathypelagic zone

   (c) Euphotic zone

   (d) Hadal zone

2. Bioluminescence in deep-sea organisms helps in (CO1, K2)

   (a) Photosynthesis

   (b) Communication and prey attraction

   (c) Temperature regulation

   (d) Oxygen intake

3. Ecosystem structure includes (CO2, K1)

(a) Energy flow only

(b) Nutrient cycling only

(c) Biotic and abiotic components

(d) Population dynamics

4. Nutrient recycling in marine ecosystems is mainly carried out by (CO2, K1)

(a) Producers

(b) Herbivores

(c) Carnivores

(d) Decomposers and microbes

5. Population density refers to (CO3, K2)

(a) Number of species per unit area

(b) Biomass per unit area

(c) Number of individuals per unit area or volume

(d) Growth rate of population

6. Logistic growth curve is represented by (CO3, K3)

(a) J-shaped curve (b) S-shaped curve

(c) U-shaped curve (d) L-shaped curve

7. Which group is especially abundant in Antarctic waters? (CO4, K2)

(a) Corals (b) Krill

(c) Mangroves (d) Seagrasses

8. Commensalism is an association where (CO4, K1)

(a) Both benefit

(b) Both harmed

(c) One benefits, other is neither harmed nor benefited

(d) One kills the other

9. Coral reefs are often called the "rainforests of the sea" due to their (CO5, K1)

(a) High species diversity

(b) High temperature

(c) Large size

(d) Deep location

10. Over exploitation of marine resources mainly results in (CO5, K2)

(a) Increased biodiversity

(b) Habitat formation

(c) Decline of fish stocks

(d) Improved ecosystem health

Part B (5 × 5 = 25)

Answer **all** questions not more than 500 words each.

11. (a) State the three main zones in the classification of marine environment. (CO1, K2)

Or

(b) Summarise the adaptations of nektonic organisms in the pelagic zone. (CO1, K5)

12. (a) Describe the functional attributes of an ecosystem. (CO2, K3)

Or

(b) Illustrate energy flow through different trophic levels in the ocean. (CO2, K3)

13. (a) Describe how natality and mortality affect population size. (CO3, K4)

Or

(b) Explain the significance of immigration and emigration. (CO3, K4)

14. (a) Explain mutualism and commensalism with marine examples. (CO4, K2)

Or

(b) Describe boring communities and their ecological significance. (CO4, K3)

15. (a) Describe the impacts of over exploitation on marine biodiversity. (CO5, K4)

Or

(b) Explain the role of MPAs in biodiversity conservation. (CO5, K4)

Part C (5 × 8 = 40)

Answer **all** questions not more than 1000 words each.

16. (a) Describe the major characteristics of the deep-sea environment. (CO1, K2)

Or

(b) Compare and analyze pelagic and benthic environments based on physical conditions and adaptations. (CO1, K4)

17. (a) Examine the role of decomposers in ecosystem functioning. (CO2, K3)

Or

(b) Analyze the relationship between ecosystem structure and function in marine environments. (CO2, K4)

18. (a) Analyze the role of group attributes in regulating population growth. (CO3, K4)

Or

(b) Explain the effect of density-independent factors on population dynamics. (CO3, K3)

19. (a) Compare the characteristic features of marine fauna of Indian, Arctic, and Antarctic oceans. (CO4, K4)

Or

(b) Illustrate adaptations of fouling organisms to their habitat. (CO4, K4)

20. (a) Examine different techniques used for assessing marine biodiversity. (CO5, K3)

Or

(b) Analyze the importance of biosecurity in marine biodiversity conservation. (CO5, K4)

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R4524

Sub. Code
25MOC2C2

M.Sc. DEGREE EXAMINATION, APRIL – 2026

Second Semester

Oceanography and Coastal Area Studies

MARINE POLLUTION

(CBCS – 2025 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** the questions by choosing the correct option.

1. High BOD in water indicates (CO1, K1)

   (a) High oxygen concentration

   (b) Low pollution

   (c) High organic pollution

   (d) High salinity

2. Dilution factor in marine waters mainly depends on (CO1, K2)

   (a) Temperature only

   (b) Salinity only

   (c) Tides and currents

   (d) Plankton abundance

3. The Mediterranean Sea is highly vulnerable to pollution because it is (CO2, K1)

(a) Semi-enclosed with limited water exchange

(b) Open Ocean system

(c) Very deep

(d) Polar in nature

4. Secondary treatment of sewage is based on (CO2, K1)

(a) Sedimentation

(b) Filtration

(c) Biological degradation of organic matter

(d) Chlorination

5. The major source of oil pollution in the marine environment is (CO3, K1)

(a) Shipping and tanker operations

(b) Offshore drilling

(c) Natural seeps

(d) Marine organisms

6. DDT is classified as (CO3, K2)

(a) Carbamate insecticide

(b) Organochlorine pesticide

(c) Organophosphate

(d) Herbicide

7. Which metal is responsible for Minamata disease? (CO4, K2)

(a) Lead (Pb)

(b) Cadmium (Cd)

(c) Copper (Cu)

(d) Mercury (Hg)

8. The unit used to measure absorbed radiation dose is (CO4, K4)

(a) Curie

(b) Becquerel

(c) Gray

(d) Sievert

9. Which organization plays a key role in global climate regulation? (CO5, K2)

(a) IPCC

(b) WHO

(c) FAO

(d) UNESCO

10. Paralytic Shellfish Poisoning (PSP) is caused by (CO5, K2)

(a) Saxitoxin

(b) Domoic acid

(c) Ciguatoxin

(d) Brevetoxin

Part B (5 × 5 = 25)

Answer **all** questions not more than 500 words each.

11. (a) Explain the significance of BOD and COD in pollution studies. (CO1, K2)

Or

(b) Describe the consequences of organic discharges into estuaries. (CO1, K2)

12. (a) Explain the effects of thermal pollution on marine life. (CO2, K4)

Or

(b) Describe the impact of fertilizer industry effluents on water bodies. (CO2, K3)

13. (a) Describe the fate of pesticides in the marine environment. (CO3, K4)

Or

(b) Illustrate how oil spill treatment methods can reduce marine pollution. (CO3, K2)

14. (a) Explain the classification of heavy metals. (CO4, K4)

Or

(b) Explain the ecological significance of eutrophication. (CO4, K4)

15. (a) Explain the role of crustaceans and mollusks in pollution monitoring. (CO5, K4)

Or

(b) Explain the role of NGOs in marine environmental protection. (CO5, K4)

Part C (5 × 8 = 40)

Answer **all** questions not more than 1000 words each.

16. (a) Compare physical, chemical, and biological effects of marine pollution. (CO1, K2)

Or

(b) Analyze the ecological significance of bioaccumulation and biomagnification in marine food webs. (CO1, K4)

17. (a) Explain how agricultural runoff leads to eutrophication. (CO2, K4)

Or

(b) Analyze the effectiveness of different sewage treatment processes. (CO2, K4)

18. (a) Analyze the factors affecting the accumulation of pesticides in marine organisms. (CO3, K4)

Or

(b) Explain the relationship between oil composition and toxicity. (CO3, K2)

19. (a) Compare essential and non-essential heavy metals in terms of toxicity. (CO4, K4)

Or

(b) Examine the causes and impacts of Minamata and Itai-Itai diseases. (CO4, K4)

20. (a) Examine the ecological and economic impacts of red tides. (CO5, K3)

Or

(b) Analyze current marine pollution monitoring strategies. (CO2, K4)

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R4525

Sub. Code
25MOC2C3

M.Sc. DEGREE EXAMINATION, APRIL – 2026

Second Semester

Oceanography and Coastal Area Studies

REMOTE SENSING AND GIS

(CBCS – 2025 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** the following objective type questions by choosing the correct option.

1. The process which losses of electromagnetic energy as it passes through the atmosphere _____ (CO1, K2)
   (a) Reflection (b) Absorption
   (c) Refraction (d) Diffraction

2. Vegetation strongly reflects electromagnetic energy in which spectral band? (CO1, K2)
   (a) Blue (b) Red
   (c) Near-infrared (d) Thermal infrared

3. Passive remote sensing sensor is _____ (C02, K1)
   (a) Radar (b) Sonar
   (c) Lidar (d) Multispectral scanner

4. An airborne platform is used for _____(CO2, K1)
   (a) Satellite-based data collection
   (b) Ground based surveys
   (c) Aircraft-mounted sensor operations
   (d) Space shuttle missions

5. Which sensor type captures data in many narrow spectral bands? (CO3, K2)

(a) Multispectral (b) Thermal

(c) Hyperspectral (d) Microwave

6. Remote sensing in agriculture is primarily used for _____ (CO3, K2)

(a) Crop yield prediction

(b) Mineral exploration

(c) Weather forecasting

(d) Oceanography

7. MODIS is onboard which NASA satellite series? (CO4, K2)

(a) Landset (b) Terra & Aqua

(c) SPOT (d) NOAA

8. SPOT satellites are primarily used for _____ (CO4, K2)

(a) Weather forecasting

(b) Military surveillance

(c) Ocean studies

(d) Catography & urban planning

9. GIS application in geology includes _____ (CO5, K1)

(a) Mineral exploration

(b) Traffic management

(c) Urban zoning

(d) Healthcare planning

10. The basic principle of GIS includes _____ (CO5, K1)

(a) Storing textual data

(b) Integrating spatial and attribute data

(c) Ignoring spatial relationship

(d) Using only manual maps

Part B (5 × 5 = 25)

Answer **all** questions not more than 500 words each.

11. (a) Define remote sensing and explain its basic principles. (CO1, K2)

Or

(b) What are the main processes of electromagnetic energy interaction in the atmosphere? (CO1, K2)

12. (a) Differentiate between airborne and spaceborne platforms. (CO2, K3)

Or

(b) What are the objectives of ariel photography missions? (CO2, K1)

13. (a) List out the principles of landform identification. (CO3, K2)

Or

(b) Describe the role of remote sensing in agricultural management. (CO3, K4)

14. (a) How do IRS satellites support India's resource management efforts? (CO4, K2)

Or

(b) Discuss the applications of EROS in urban mapping. (CO4, K4)

15. (a) Differentiate supervised and unsupervised classification. (CO5, K4)

Or

(b) Give a brief note principle of GIS. (CO5, K4)

Part C (5 × 8 = 40)

Answer **all** questions not more than 1000 words each.

16. (a) Explain the electromagnetic spectrum used in remote sensing and describe atmospheric interactions. (CO1, K4)

Or

(b) Describe atmospheric windows and their importance in sensor designing. (CO1, K3)

17. (a) Explain in detail on the types of sensors and platforms. (CO2, K4)

Or

(b) Analyze the role of aerial photography missions in resource mapping. (CO2, K3)

18. (a) Discuss how metabolism and excretion process impact drug efficacy and safety. (CO3, K5)

Or

(b) What are the advantages and disadvantages of oral vs intravenous drug administration in pharmaceutical studies? (CO3, K5)

19. (a) Elucidate the role of commercial satellites such as IKONOS and EROS. (CO4, K6)

Or

(b) Compare the spatial, spectral and temporal resolutions of Landsat, SPOT and IRS satellites. (CO4, K6)

20. (a) Elaborate the components of GIS and how they support geological applications. (CO5, K6)

Or

(b) Discuss the application of GIS in natural resource management with examples of raster and vector analysis. (CO5, K6)

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R4526

Sub. Code
25MOC2C4

M.Sc. DEGREE EXAMINATION, APRIL – 2026

Second Semester

Oceanography and Coastal Area Studies

AQUACULTURE

(CBCS – 2025 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** the following objective type questions by choosing the correct option.

1. _____ is the type of coastal aquaculture. (CO1, K2)

   (a) Freshwater fish farming

   (b) Mariculture

   (c) Sericulture

   (d) Horticulture

2. _____ is the major constraint in coastal aquaculture development. (CO1, K2)

   (a) abundant resources

   (b) lack of technology

   (c) disease outbreaks

   (d) limited market demand

3. Primary purpose of an outlet structure in a pond? (CO2, K1)

(a) Increase water level

(b) Remove excess water and waste

(c) Addition of fertilizer

(d) Introduce new fish species

4. Raft culture is for _____ (CO2, K2)

(a) Finfish farming

(b) Shrimp farming

(c) Seaweed culture

(d) None of the above

5. Water quality management helps in maintaining _____ (CO3, K1)

(a) pH levels and turbidity

(b) fish population density

(c) pond depth variations

(d) water temperature fluctuations

6. _____ is the highly predatory and canabalistic nature fish. (CO3, K2)

(a) *Trachinotus blochii*

(b) *Rastrelliger kanagurtha*

(c) *Epinephalus sp*

(d) *Lates calcarifer*

7. Induced breeding is used in aquaculture for_____ (CO4, K2)

(a) natural spawning

(b) artificial reproduction

(c) both (a) and (b)

(d) none of the above

8. Purpose of algal culture in a molluscan hatchery is for _____ (CO4, K2)

(a) Water treatment (b) Nutrient cycling

(c) Seed production (d) Larval feed

9. _____ agency focuses on brackish-water fish famers. (CO5, K1)

(a) BFFDA (b) FFDA

(c) NGO (d) NABARD

10. FCR (Feed Convertion Ratio) formula _____ (CO5, K1)

(a) FCR = Total feed consumed / Total weight gain × 100

(b) FCR = Total weight gain / Total feed consumed

(c) FCR = Total feed consumed / Total weight gain

(d) FCR= Total weight gain × Total feed consumed / 100

Part B (5 × 5 = 25)

Answer **all** questions not more than 500 words each.

11. (a) What are the importance of coastal aquaculture? (CO1, K2)

Or

(b) Discuss the challenges faced by coastal aquaculture farmers. (CO1, K2)

12. (a) Explain raft culture practices. (CO2, K4)

Or

(b) Describe the design features of inlet and outlet structures in a pond systems. (CO2, K4)

13. (a) Explain the importance of Pond management in aquaculture. (CO3, K4)

Or

(b) What are the methods used for the control of predators in fish farms? (CO3, K1)

14. (a) Explain how algal culture units supports larval rearing in hatcheries. (CO4, K2)

Or

(b) Outline the procedure for mass production of fish seeds in a hatchery. (CO4, K4)

15. (a) Why is feed management is crucial for pond productivity? (CO5, K4)

Or

(b) List the steps involved in designing a feed formulation for Shrimps. (CO5, K4)

Part C (5 × 8 = 40)

Answer **all** the questions not more than 1000 words each.

16. (a) Explain the environmental impacts of coastal aquaculture. (CO1, K4)

Or

(b) Discuss the future prospects of coastal aquaculture in India (CO1, K3)

17. (a) Outline a comprehensive operation and maintenance plan for open-sea farming. (CO2, K4)

Or

(b) Discuss the integrated design of supply and drainage canals with pond systems in aquaculture farms. (CO2, K3)

18. (a) Write detailed notes on farm management practices. (CO3, K5)

Or

(b) Describe the water quality management techniques and their role in controlling predators and diseases in ponds. (CO3, K5)

19. (a) Outline the economic and biological factors influencing the choice between natural spawning and induced breeding in hatcheries. (CO4, K4)

Or

(b) Discuss the entire hatchery production cycle finfish. (CO4, K2)

20. (a) Evaluate the role of government agencies (FFDA and BFFDA) and NGO's in fisheries extension for feed management. (CO5, K5)

Or

(b) Describe the environmental impact of feed management practices in aquaculture. (CO5, K4)

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R4527

Sub. Code
25MOC2E2

M.Sc. DEGREE EXAMINATION, APRIL – 2026

Second Semester

Oceanography and Coastal Area Studies

Elective – MARINE NATURAL PRODUCTS

(CBCS – 2025 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** the following objective type questions by choosing the correct option.

1. _____ is the primary role of secondary metabolites in marine organisms. (CO1, K2)

   (a) Energy storage

   (b) Reproduction

   (c) Structural support

   (d) Defence against predators

2. Bryostatin is the marine natural products from sponges which has _____. (CO1, K2)

   (a) Antiviral activity

   (b) Antitumor activity

   (c) Antifungal activity

   (d) Antibacterial activity

3. Which of the following is NOT a step in bio sample process? (CO2, K1)

(a) Transportation

(b) Screening

(c) Fractionation

(d) Drying

4. Structural characterization of bioactive compounds helps in _____. (CO2, K2)

(a) Chemical structure identification

(b) Storing sampling

(c) Isolation

(d) Both (a) & (c)

5. ADME in pharmacology stands for _____. (CO3, K1)

(a) Absorption, Dosage, Monitoring, Effect

(b) Analysis, Dosage, Monitoring, Effect

(c) Absorption, Distribution, Metabolism, Excretion

(d) Absorption, Diffusion, Metabolism, Excretion

6. Drug distribution mainly occurs in which region? (CO3, K2)

(a) Liver

(b) Lungs

(c) Kidney

(d) Heart

7. Algae are used as biostimulants for _____.
(CO4, K2)

(a) cosmetic fragrances

(b) agricultural and animal nutrition

(c) industrial cleaning

(d) textile manufacturing

8. _____ algae is known for its high protein content.
(CO4, K2)

(a) *Nannochloropsis* sp

(b) *Nostoc* sp

(c) *Skeletonema* sp

(d) *Spirulina* sp

9. TRIPS is an agreement related to _____.
(CO5, K1)

(a) Trade-related aspects of Intellectual Property Rights

(b) Technical regulations in international patents

(c) Taxation rules for international products

(d) Transport regulations for imports

10. Which of the following is NOT a type of Intellectual Property Rights? (CO5, K1)

(a) Patent

(b) Copyright

(c) Trade mark

(d) Export license

Part B (5 × 5 = 25)

Answer **all** questions not more than 500 words each.

11. (a) Define Marine Natural Products. C1assify MNP's based on their sources. (CO1, K2)

Or

(b) Ecological significance of marine natural products in survival and adaption of marine organisms (Predator-Prey interactions). (CO1, K2)

12. (a) Briefly explain the six steps used in processing bioactive compounds. (CO2, K3)

Or

(b) What is the purpose of herbarium making in the bio sample process? (CO2, K4)

13. (a) Explain each step involved in ADME process. (CO3, K2)

Or

(b) List some of the marine natural products used for clinical purposes. (CO3, K4)

14. (a) Discuss the role of algae in human conception studies. (CO4, K2)

Or

(b) Describe the process of extracting chemicals from marine algae. (CO4, K4)

15. (a) What are the applications and rules of patent rights? (CO5, K4)

Or

(b) Brief notes on the history of WIPO. (CO5, K4)

Part C (5 × 8 = 40)

Answer **all** questions not more than 1000 words each.

16. (a) Discuss the significance of marine microorganisms as source of novel bioactive compounds. (CO1, K4)

Or

(b) How metabolites from marine organisms affect microfilament- mediated processes? (CO1, K3)

17. (a) How each step in bio sample processing is important in ensuring sample's quality and in preservation of bioactive compounds? (CO2, K4)

Or

(b) Discuss the factors influencing the extraction and isolation of bioactive compounds from marine samples. (CO2, K3)

18. (a) Discuss how metabolism and excretion process impact drug efficacy and safety? (CO3, K5)

Or

(b) What are the advantages and disadvantages of oral vs intravenous drug administration in pharmaceutical studies? (CO3, K5)

19. (a) How do algal products play in fish and cattle feed formulations? (CO4, K1)

Or

(b) Describe the significance of algae in human nutrition and conception related health. (CO4, K6)

20. (a) What is patent licensing in biotechnology? Under what circumstances government can provide compulsory license for a patented biotechnology product? (CO5, K2)

Or

(b) Discuss key features of the agreement on TRIPS. (CO5, K2)

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R4528

Sub. Code
25MOC2S1

M.Sc. DEGREE EXAMINATION, APRIL – 2026

Second Semester

Oceanography and Coastal Area Studies

ORNAMENTAL FISH CULTURE

(CBCS – 2025 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** the following objective type questions by choosing the correct option.

1. Overexploitation of ornamental fishes mainly affects (CO1, K2)

   (a) Coral Reef Ecosystems

   (b) Open Ocean Ecosystems

   (c) Deep Sea Ecosystems

   (d) Estuarine Mudflats

2. Sustainable ornamental fish culture helps in (CO1, K2)

   (a) Increasing Reef Destruction

   (b) Reducing Wild Capture Pressure

   (c) Increasing Pollution

   (d) Habitat Loss

3. Trigger fishes belong to the family (CO2, K3)

(a) Pomacentridae

(b) Balistidae

(c) Gobiidae

(d) Blenniidae

4. Major marine ornamental fish resources of India occur in (CO2, K3)

(a) Sundarbans Only

(b) Andaman & Nicobar Islands

(c) Lakshadweep Islands

(d) Both (b) and (c)

5. Public marine aquariums are primarily established for (CO3, K4)

(a) Commercial Fishing

(b) Education and Conservation

(c) Fish Breeding Only

(d) Aquarium Trade

6. Protein skimmers are mainly used to (CO3, K3)

(a) Remove Organic Wastes

(b) Increase Salinity

(c) Increase Light Penetration

(d) Improve Colour of Fish

7. Fin rot disease in fish is mainly caused by (CO4, K1)

(a) Virus

(b) Fungus

(c) Bacteria

(d) Protozoa

8. Parasites mainly spread through (CO4, K4)

(a) Air

(b) Contaminated Water and Live Feed

(c) Sunlight

(d) Temperature

9. Transgenic organisms are produced by (CO5, K4)

(a) Selective Breeding

(b) Cross Breeding

(c) Introduction of Foreign Genes

(d) Polyploidy

10. Biotechnology helps in aquaculture mainly through (CO5, K2)

(a) Increased Pollution

(b) Improved Growth and Disease Resistance

(c) Reduced Productivity

(d) Habitat Destruction

Part B (5 × 5 = 25)

Answer **all** the questions not more than 500 words each.

11. (a) Describe the importance of marine ornamental fish trade. (CO1, K2)

Or

(b) Explain the importance of sustainable practices in ornamental fisheries. (CO1, K4)

12. (a) Describe the habitats of marine ornamental fishes. (CO2, K3)

Or

(b) Illustrate the methods of live fish collection. (CO2, K3)

13. (a) Explain the importance of filtration in marine aquariums. (CO3, K3)

Or

(b) Explain the educational role of public marine aquariums. (CO3, K4)

14. (a) Describe symptoms of bacterial fish diseases. (CO4, K2)

Or

(b) Explain the role of Artemia in larval feeding. (CO4, K3)

15. (a) Describe genetic manipulation techniques. (CO5, K4)

Or

(b) Explain the advantages of polyploidy. (CO5, K3)

Part C (5 × 8 = 40)

Answer **all** the questions not more than 1000 words each.

16. (a) Evaluate future prospects of marine ornamental fish culture in India. (CO1, K5)

Or

(b) Demonstrate the role of hatcheries in ornamental fish production. (CO1, K4)

17. (a) Analyze the diversity of marine ornamental fishes in coral reefs. (CO2, K4)

Or

(b) Evaluate future prospects of marine ornamental fish culture. (CO2, K5)

18. (a) Apply engineering principles to design a medium-sized marine aquarium. (CO3, K4)

Or

(b) Examine the relationship between tank design and water pressure. (CO3, K3)

19. (a) Compare bacterial, fungal and viral fish diseases and write its causes and treatment. (CO4, K4)

Or

(b) Examine the challenges in mass-scale live feed production. (CO4, K4)

20. (a) Analyze the impacts of transgenic organisms on the environment. (CO5, K4)

Or

(b) Evaluate biotechnology as a tool for genetic improvement. (CO5, K5)

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