

R3591

Sub. Code

461301

M.Sc. DEGREE EXAMINATION, NOVEMBER – 2025

Third Semester

Oceanography and Coastal Area Studies

FISH AND FISHERIES

(CBCS – 2022 onwards)

Time : 3 Hours

Maximum : 75 Marks

Part A

(10 × 1 = 10)

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

1. The organism responsible for maintaining the major marine biodiversity. (CO1, K2)
(a) Seagrass (b) Corals
(c) Macroalgae (d) Phytoplankton
2. Exclusive Economic Zone) in India is up to (CO1, K2)
(a) 200 nautical miles
(b) 12 nautical miles
(c) 24 nautical miles
(d) None of these
3. Mullet is an example for ————— type of fish. (CO2, K3)
(a) Fresh water fish (b) Marine water fish
(c) Cartilaginous fish (d) Brackish water fish

4. National Fisheries Development Board is located in (CO2, K3)
- (a) Chennai (b) Cochin
(c) Bangalore (d) Hyderabad
5. “Blue Revolution” is related with the following (CO3, K3)
- (a) Rice production (b) Fish production
(c) Egg production (d) Milk production
6. Induced breeding technique is used in. (CO3, K3)
- (a) Marine fishery (b) Inland fishery
(c) Capture fishery (d) Culture fishery
7. _____ is the example for active fishing gear (CO4, K4)
- (a) Trawl net (b) Beach seine
(c) Gill net (d) Trap net
8. The craft material generally used in commercial and pleasure crafts are. (CO4, K4)
- (a) Aluminium (b) Wood
(c) FRP (d) All of the above
9. Which organization is responsible for promoting fish export in India. (CO5, K4)
- (a) CIBA (b) MPEDA
(c) NFDB (d) CMFRI
10. The simplest construction of boat hull is (CO5, K4)
- (a) Round bottom (b) Flat bottom
(c) V bottom (d) None of the above

Part B

(5 × 5 = 25)

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

11. (a) Outline the importance of in-situ with examples.
(CO1, K2)

Or

- (b) Summarize the important targeted fisheries resources in Indian Ocean.
(CO1, K2)

12. (a) Explain about the food and feeding habits of fish.
(CO2, K3)

Or

- (b) How do you calculate the Catch Per Unit Effort? Explain with examples.
(CO2, K3)

13. (a) How do you maintain the mesh size regulations?
(CO3, K3)

Or

- (b) Outline the importance of FAO code of conduct for responsible fisheries.
(CO3, K3)

14. (a) Illustrate the by-catch reduction devices in trawls.
(CO4, K4)

Or

- (b) Explain about the different types of fishing boats.
(CO4, K4)

15. (a) Write a brief account on biodiversity bill.
(CO5, K4)

Or

- (b) Explain about the importance of fishing bans.
(CO5, K6)

Part C

(5 × 8 = 40)

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

16. (a) Summaries the major exploited fisheries resources in Oceanic water. (CO1, K2)

Or

- (b) Describe about endangered and threatened marine species. (CO1, K2)

17. (a) Interpret the concept of maximum sustainable yield with suitable examples. (CO2, K3)

Or

- (b) Write a detailed account on the biology of a fish with neat illustration. (CO2, K3)

18. (a) Describe about international fishery regulations and treaties. (CO3, K3)

Or

- (b) Interpret the concept and principles of fisheries management. (CO3, K3)

19. (a) Write an essay on turtle excluder devices. (CO4, K4)

Or

- (b) Give detailed accounts on modern equipment for fish finding and capturing. (CO4, K4)

20. (a) Explain the importance of marine protected areas with examples. (CO5, K4)

Or

- (b) Discuss in detail – Alternative livelihood options for fisher communities. (CO5, K4)

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Sub. Code

461302

M.Sc. DEGREE EXAMINATION, NOVEMBER – 2025

Third Semester

Oceanography and Coastal Area Studies

POST - HARVEST TECHNOLOGY

(CBCS – 2022 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. Which preservation technique involves removing moisture from the fish? (CO1, K2)
 - (a) Fermentation
 - (b) Canning
 - (c) Drying
 - (d) Freezing
2. Which method is commonly used to preserve the freshness of fish during transportation? (CO1, K2)
 - (a) Canning
 - (b) Smoking
 - (c) Refrigeration
 - (d) Drying

3. Which enzyme is primarily responsible for the breakdown of proteins in fish during post-harvest handling? (CO2, K3)
- (a) Lipase
 - (b) Pepsin
 - (c) Amylase
 - (d) Protease
4. In fish processing, 'filleting' refers to (CO2 K3)
- (a) The gutting of the fish
 - (b) Removing the bones. from a fish
 - (c) Cutting the fish into steaks
 - (d) Removing the skin from the fish
5. What is one of the main reasons for freezing cephalopods immediately after harvest? (CO3 K3)
- (a) To enhance flavour
 - (b) To prevent spoilage and enzyme activity
 - (c) To improve texture
 - (d) To reduce costs
6. What is the ideal temperature range for storing fish to maximize its shelf life? (CO3, K3)
- (a) 0°C to 4°C
 - (b) 5°C to 10°C
 - (c) 15°C to 20°C
 - (d) 20°C to 25°C

7. What is a common quality concern in the packaging of frozen fish? (CO4, K4)
- (a) Colour loss
 - (b) Texture changes
 - (c) Nutrient loss
 - (d) All of the above
8. What is a common packaging technique used for frozen fish? (CO4, K4)
- (a) Polyethylene film
 - (b) Paper wrapping
 - (c) Wooden crates
 - (d) None of the above
9. Which of the following is a key attribute of packaging for international trade of fishery products? (CO5, K4)
- (a) Lightweight
 - (b) Aesthetic appeal
 - (c) Compliance with regulatory standards
 - (d) Cost-efficiency
10. Which of the following is NOT a focus area of the Codex alimentarius concerning seafood? (CO5, K5)
- (a) Microbiological safety
 - (b) Chemical contaminants
 - (c) Nutritional labelling
 - (d) Genetic engineering

Part B

(5 × 5 = 25)

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

11. (a) Express the significance of proper handling techniques in the post-harvest technology of fish. (CO1, K2)

Or

- (b) Summarises the impact of poor-quality ice on fish quality during handling and processing. (CO1, K2)

12. (a) What are the factors affecting the quality of fish? (CO2, K3)

Or

- (b) Describe the importance of fish processing. (CO2, K3)

13. (a) What are the different types of freezing methods involved in fish packaging? (CO3, K3)

Or

- (b) Name the key steps involved in processing of cephalopods. (CO3, K3)

14. (a) Label the types of laminates used for fish packaging. (CO4, K4)

Or

- (b) List the packaging standards for domestic and international trade. (CO4, K4)

15. (a) Explain the organoleptic quality assessment. (CO5, K4)

Or

- (b) Justify the role of codex alimentarius in seafood quality standards. (CO5, K6)

Part C

(5 × 8 = 40)

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

16. (a) Compare the efficiency and cost on fish quality during train and insulated van transport. (CO1, K2)

Or

- (b) Outline the key benefits of refrigerated sea water for fish preservation. (CO1, K2)

17. (a) Name the chemical changes in lipids and proteins during the fish process. (CO2, K3)

Or

- (b) Describe the importance of pre-treatment techniques in the processes of fish gutting and filleting. (CO2, K3)

18. (a) How does the temperature and duration of storage affects the quality and shelf life of fish? (CO3, K3)

Or

- (b) Relate the significance of quality control with fresh and processed fish. (CO3, K3)

19. (a) What are the key considerations for packaging that minimizes the spoilage during the shipping of fishery products? (CO4, K4)

Or

- (b) Name the significant factors and technologies involved in the development of protective packaging for fishery products. (CO4, K4)

20. (a) Interpret the physical and chemical quality standards for seafood quality assessment. (CO5, K4)

Or

- (b) Explain the role of USFDA and EU regulation for export trade in seafood quality. (CO5, K4)
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Sub. Code

461303

M.Sc. DEGREE EXAMINATION, NOVEMBER – 2025

Third Semester

Oceanography and Coastal Area Studies

OCEAN MANAGEMENT

(CBCS – 2022 onwards)

Time : 3 Hours

Maximum : 75 Marks

Part A

(10 × 1 = 10)

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

1. What is the primary driver of global fishery resource depletion? (CO1, K2)
 - (a) Recreational fishing
 - (b) Overfishing and unsustainable fishing practices
 - (c) Marine protected areas
 - (d) Fish farming (aquaculture)

2. Which natural feature plays a crucial role in protecting coastal zones from erosion and storm surges? (CO1, K2)
 - (a) Mangroves and coral reefs
 - (b) Sand dunes
 - (c) Artificial seawalls only
 - (d) Offshore oil rigs

3. Which of the following is a sustainable solution to fishery resource depletion? (CO2, K3)
- (a) Implementing marine protected areas and fishing quotas
 - (b) Encouraging illegal fishing practices
 - (c) Increasing deep-sea trawling
 - (d) Eliminating aquaculture
4. When is International Coastal Cleanup Day observed each year? (CO2, K3)
- (a) June 5
 - (b) September 16
 - (c) October 2
 - (d) December 10
5. What is the IPCC? (CO3, K3)
- (a) A government agency that promotes fossil fuel use
 - (b) An organization that promotes climate change denial
 - (c) A scientific panel that provides unbiased climate change information
 - (d) Renewable energy companies
6. Which of the following is an example of mariculture? (CO3, K3)
- (a) Growing rice in coastal fields
 - (b) Raising shrimp in seawater ponds
 - (c) Catching fish in the open ocean
 - (d) Farming freshwater fish in ponds
7. What is the name for a zone where temperature rapidly changes with depth? (CO4, K2)
- (a) Thermohaline
 - (b) Thermocline
 - (c) Pycnocline
 - (d) Halocline

8. Which country has the largest exclusive economic zone? (CO4, K2)
- (a) India (b) China
(c) USA (d) France
9. What does UNEP stand for? (CO5, K4)
- (a) United Nations Economic Program
(b) United Nations Environmental Protection
(c) United Nations Environment Programme
(d) United Nations Energy Policy
10. Which oceanic region is recognized as a major marine biodiversity hotspot? (CO5, K4)
- (a) Arctic Ocean
(b) Indo-Pacific region
(c) Mediterranean Sea
(d) North Atlantic Ocean

Part B

(5 × 5 = 25)

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

11. (a) Define the Exclusive Economic Zone (EEZ). Discuss the significance of India's EEZ in terms of marine resources and economic potential. (CO1, K2)

Or

- (b) What are the major threats to India's coastal ecosystems? (CO1, K2)

12. (a) Discuss the role of technology and innovation in improving coastal mariculture production. (CO2, K2)

Or

- (b) What is the Coastal Regulation Zone (CRZ) in India? Explain its objectives and importance. (CO2, K3)

13. (a) Describe the major marine biodiversity hotspots in India. (CO3, K3)

Or

- (b) Write a note on Gulf of Mannar Marine Natural Park. (CO3, K3)

14. (a) Explain the role of mangroves in coastal protection. (CO4, K2)

Or

- (b) What is eutrophication? Explain its causes and consequences on coastal ecosystems. (CO4, K2)

15. (a) Write note on international agencies and organisations in ocean management. (CO5, K4)

Or

- (b) Give an account on effect of port activities and coastal pollution on various coastal ecosystems. (CO5, K4)

Part C

(5 × 8 = 40)

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

16. (a) Write an essay on national and global problem in coastal zone. (CO1, K2)

Or

- (b) How does India's EEZ contribute to marine fisheries? Discuss the challenges of overfishing and the measures taken for sustainable fisheries management. (CO2, K2)

17. (a) Explain the role of government policies and international initiatives in addressing coastal zone management issues. Provide examples of key programs. (CO2, K3)

Or

- (b) Give an account on marine fisheries management policies. (CO2, K3)

18. (a) Write an essay on Indian national marine biosphere reserve. (CO3, K3)

Or

- (b) Describe the role of Marine Protected Areas in conserving marine biodiversity. How effective are MPAs in biodiversity conservation? (CO3, K3)

19. (a) Discuss the impact of tourism on coastal zones and how regulations help mitigate negative effects. (CO4, K2)

Or

- (b) What are the major species cultivated in mariculture? Explain their economic and ecological importance. (CO4, K2)

20. (a) Discuss the major threats to marine biodiversity at a global level. How do human activities impact marine ecosystems? (CO5, K4)

Or

- (b) How does the United Nations Environment Programme (UNEP) contribute to ocean pollution control and marine protection? (CO5, K4)
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R3594

Sub. Code

461304

M.Sc. DEGREE EXAMINATION, NOVEMBER – 2025

Third Semester

Oceanography and Coastal Area Studies

RESEARCH METHODOLOGY

(CBCS – 2022 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. Name the term that describes farming multiple species in the same environment. (CO1, K1)
 - (a) Monoculture
 - (b) Polyculture
 - (c) Monosex culture
 - (d) Homoculture

2. Which of the following is NOT a meristic character? (CO1, K1)
 - (a) Number of gill rakers
 - (b) Number of vertebrae
 - (c) Total length of the fish
 - (d) Number of fin spines

3. What is the main principle behind SEM (Scanning Electron Microscope)? (CO2, K2)
- (a) It shines light through the sample
 - (b) It makes the sample glow in the dark
 - (c) It takes a picture from far away
 - (d) It scans the surface with electrons and collects the ones knocked off
4. Match the following. (CO2, K2)
- (a) Fixation – (i) Surrounds tissue in a block to make it firm for slicing
 - (b) Dehydration – (ii) Turns tissue transparent and replaces alcohol with wax-friendly liquid
 - (c) Embedding – (iii) Removes water so wax can go inside
 - (d) Clearing – (iv) Preserves the tissue and keeps its shape
5. Why is affinity chromatography special? (CO3, K2)
- (a) It uses magnets to attract metal
 - (b) It turns sandwiches into gold
 - (c) It measures the speed of stars
 - (d) It picks specific molecules, like getting puzzles to match together
6. What is a key application of agarose gel electrophoresis? (CO3, K2)
- (a) Detecting protein post-translational modifications
 - (b) Separating DNA fragments by size for PCR analysis
 - (c) Generating capillary separations quickly
 - (d) Visualising protein bands with heat

7. How are regression and ANOVA mathematically related? (CO4, K2)
- (a) They are completely different methods
 - (b) Regression is for prediction; ANOVA is exclusively graphical
 - (c) ANOVA is a special case of regression using categorical predictors
 - (d) Regression always uses ANOVA tables
8. Which BLAST variant should you use when searching a protein sequence against a translated nucleotide database? (CO4, K2)
- (a) BLASTp
 - (b) BLASTn
 - (c) BLASTx
 - (d) TBLASTn
9. Which metric in Scopus measures average citations per document over time? (CO5, K2)
- (a) Impact Factor
 - (b) CiteScore
 - (c) H-index
 - (d) Altmetric
10. Which computer-based tool can be used to compute p-values and t-tests efficiently? (CO5, K2)
- (a) Mega
 - (b) SPSS or RStudio
 - (c) Excel
 - (d) Word

Part B

(5 × 5 = 25)

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

11. (a) Compare extensive, semi-intensive, and intensive culture systems with examples from finfish farming. (CO1, K3)

Or

- (b) Evaluate the limitations of using gonad histology alone to estimate reproductive periodicity in crustaceans. (CO1, K3)

12. (a) Differentiate between bright-field and dark-field microscopy. (CO2, K3)

Or

- (b) List the basic steps in histological tissue processing. (CO2, K3)

13. (a) List out the difference between X-ray diffraction and electron diffraction. (CO3, K2)

Or

- (b) Describe the principles and applications of HPLC. (CO3, K3)

14. (a) Evaluate using Chi-square for breeding periodicity in finfish when some months have zero counts. (CO4, K4)

Or

- (b) Explain the significance of BLAST and FASTA. (CO4, K4)

15. (a) Discuss the ethical implications of excessive self-citation in manuscript preparation. (CO5, K4)

Or

- (b) Evaluate the pros and cons of using 3D charts in scientific presentations. (CO5, K4)

Part C

(5 × 8 = 40)

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

16. (a) Explain in detail the principle and applications of the ultracentrifuge. (CO3, K3)

Or

- (b) Describe the types of micro techniques in histology. (CO2, K2)

17. (a) Elaborate in detail on the fluorescence microscope. (CO2, K3)

Or

- (b) Describe the differences in culture conditions required for diatoms versus dinoflagellates. (CO1, K2)

18. (a) Write an essay on PAGE and SDS-PAGE with its applications. (CO3, K3)

Or

- (b) Discuss the effect of water temperature and salinity on seaweed culture. (CO1, K2)

19. (a) Outline the steps for preparing a biological sample for SEM observation. (CO3, K1)

Or

- (b) Explain the role of PCR in gene cloning and sequencing. (CO3, K2)

20. (a) Why are cDNA libraries important in molecular biology? (CO4, K2)

Or

- (b) Explain the applications of Isoelectric focusing in detail. (CO4, K3)
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R3595

Sub. Code

461505

M.Sc. DEGREE EXAMINATION, NOVEMBER – 2025

Third Semester

Oceanography and Coastal Area Studies

**Elective : MARINE BIOFOULING, PREVENTION AND
MANAGEMENT**

(CBCS – 2022 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. Corrosion is a spontaneous _____ reaction. (CO1, K1)
(a) Oxidation (b) Redox
(c) Reduction (d) Photoic
2. Corrosion occurs when _____ reacts with metals. (CO1, K2)
(a) Oxygen (b) Nitrogen
(c) Water (d) Metals
3. One of the major components of EPS is (CO2, K1)
(a) Proteins (b) Lipids
(c) Polysaccharides (d) Nucleic acids
4. The Macrofoulers include (CO2, K2)
(a) Tunicates (b) Cnidarians
(c) Bivalves (d) All of the above

5. The bacterial biofilms are made of _____ microbes. (CO3, K2)
- (a) Single species (b) A consortium
(c) Chemotrophic (d) Autotrophic
6. A commensal is an organism (CO3, K2)
- (a) Preys on the host
(b) Which harms the host
(c) Is neither benefiting nor harming
(d) which benefits the host
7. Mariculture includes the *in situ* cultivation of (CO4, K2)
- (a) Marine fishes
(b) Marine molluscs
(c) Planktonic forms
(d) Marine organisms
8. The hull of a ship is _____ part. (CO4, K2)
- (a) The top surface (b) The submerged
(c) The propeller (d) The body
9. The less toxic current anti-foulants chemicals are (CO5, K2)
- (a) Iron based (b) Polymer based
(c) Copper-based (d) Mercury based
10. Dry docking is done as a part of (CO5, K2)
- (a) Educational program
(b) Aquaculture
(c) fishing
(d) Ship maintenance

Part B

(5 × 5 = 25)

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

11. (a) Determine the factors favouring biofouling. (CO1, K2)
- Or
- (b) Interpret the mechanism involved in micro-community adhesion in the fouling process. (CO1, K2)
12. (a) Elaborate on the procedure and principle of Winkler's method. (CO2, K3)
- Or
- (b) Give a short note on water quality parameters. (CO2, K3)
13. (a) Assess the role of quorum sensing in biofilm formation. (CO3, K4)
- Or
- (b) Evaluate various varieties of bacterial communities in the initial stages of biofouling. (CO3, K4)
14. (a) How does marine bio-fouling affect the maritime economy? (CO4, K3)
- Or
- (b) Evaluate the types of macrofoulers in fouling. (CO4, K3)
15. (a) Justify the use of antifouling chemicals in marine structures. (CO5, K3)
- Or
- (b) How is biofouling controlled? What are the methods adopted to control fouling biota? (CO5, K3)

Part C

(5 × 8 = 40)

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

16. (a) Explain the types and methods of evaluating corrosion in detail. (CO1, K3)
- Or
- (b) Provide a detailed note on the factors affecting corrosion in the marine environment. (CO1, K3)
17. (a) Describe the sequential process of biofouling and factors favouring it. (CO2, K4)
- Or
- (b) Enumerate on the production of Extracellular polymerising substances by microfoulers. (CO2, K4)
18. (a) Write an essay on “the interaction between microbes and biofouling on ship hulls”. (CO3, K3)
- Or
- (b) Write an essay on “the process by which microbes thrive on metal surfaces”. (CO3, K3)
19. (a) Write a detailed note on the fouling-induced financial burden in the maritime economy. (CO4, K4)
- Or
- (b) Elaborate on the impacts of biofouling in fisheries-related equipment. (CO4, K4)
20. (a) Compare the environmental aspects of current non-toxicant antifoulants with the old toxic formulations. (CO5, K3)
- Or
- (b) Explain the methods of cleaning ships And other bio-fouled surfaces. (CO5, K3)