R3661	Sub. Code 547301

M.Sc. DEGREE EXAMINATION, NOVEMBER – 2025

Third Semester

Fisheries Science

COASTAL AQUACULTURE AND MARICULTURE

(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. Who was called the founding father of inland fisheries development (CO1, K2)

   (a) Hiralal Chaudhuri

   (b) James

   (c) Wilson

   (d) Verghese Kurien

2. India's coastal length (CO1, K6)

   (a) 8349 km (b) 7129 km

   (c) 8129 km (d) 7674 km

3. Central Institute of Brackish Water Aquaculture (CIBA) located at (CO2, K6)

   (a) Bhubaneswar (b) Chennai

   (c) Mumbai (d) Cochin

4. Which among the following is potamodromous fish (CO2, K6)

(a) Cod (b) Tuna

(c) Herring (d) Catfish

5. Which state is the leading marine fish producer in India by 2022? (CO3, K6)

(a) Tamil Nadu (b) Gujarat

(c) Kerala (d) Maharashtra

6. Scientific name of cobia ————————. (CO3, K6)

(a) Rastrelliger kanangurta

(b) Rachycentron canadum

(c) Dicentrachus labrax

(d) Lates calcarifer

7. Catadromous means (CO4, K2)

(a) Sea to River (b) River to Sea

(c) River to Estuary (d) Estuary to River

8. Which is the first larval stage of penaeid prawns? (CO4, K6)

(a) Nauplius (b) Mysis

(c) Zoea (d) Megalopa

9. ———————— is known as aquatic chicken. (CO5, K2)

(a) Tilapia (b) Rohu

(c) Calbasu (d) Gold fish

10. Which of the following product of fishes is used for clearing wines? (CO5, K2)

(a) Shagreen (b) Isinglass

(c) Fish flour (d) Fish oil

Part B (5 × 5 = 25)

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

11. (a) Describe detailed account on the current potential of fresh water aquaculture in India. (CO1, K4)

Or

(b) Write in detail your view on the development of world seafood production. (CO1, K2)

12. (a) Explain the steps of soil culture for shrimp farming. (CO2, K2)

Or

(b) Write a brief description of the culture and production technique of mud crab. (CO2, K4)

13. (a) Draw a neat sketch of the life cycle of Penaeus indicus and explain each stage. (CO3, K4)

Or

(b) Explain the traits of important cultivable molluscans. (CO3, K4)

14. (a) Discuss the economic importance of seaweeds with examples. (CO4, K4)

Or

(b) Explain the salient features of molluscan farming. (CO4, K2)

15. (a) List the cultivable freshwater finfishes and explain their culture types. (CO5, K2)

Or

(b) Write a note about water quality management for aquaculture? (CO5, K4)

Part C

(5 × 8 = 40)

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

16. (a) Explain in detail the scope of brackish water aquaculture in India. (CO1, K4)

Or

(b) Write an essay on semi-intensive aquaculture system of shrimp farming and its merits and demerits. (CO1, K4)

17. (a) Describe potential species and criteria for selection of species for pen and raft culture. (CO2, K4)

Or

(b) Explain the various steps involved in the mussel farming in raft culture. (CO2, K4)

18. (a) Describe in detail the feed formulation and processing techniques in fish feed production. (CO3, K4)

Or

(b) Explain in detail about Recirculatory Aquaculture System (RAS) in fish farming. (CO3, K4)

19. (a) Write a details description of the culture and production technique of pearl oyster. (CO4, K4)

Or

(b) State the present status, problems and prospects of seed production of commercially important cultivated molluscs in India. (CO4, K4)

20. (a) Explain in detail RAS system of aquaculture. (CO5, K4)

Or

(b) Write an essay on feed and water quality management in ponds of Catla culture. (CO5, K4)

R3662

Sub. Code
547302

M.Sc. DEGREE EXAMINATION, NOVEMBER – 2025

Third Semester

Fisheries Science

ORNAMENTAL AQUACULTURE

(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. The gestation period of molly (CO1, K2)

   (a) 12 days (b) 24 days

   (c) 28 days (d) 30 days

2. Aquarium water should be aerated during (CO1, K1)

   (a) Night (b) Evening

   (c) Early morning (d) Noon

3. _____ Being the first among ornamental fish producing country. (CO2, K1)

   (a) India (b) Japan

   (c) Singapore (d) Malaysia

4. Which state in India has highest ornamental fish production? (CO2, K5)

   (a) Tamil Nadu (b) Kerala

   (c) Odissa (d) West Bengal

5. Eggs of goldfish are _____ in nature. (CO3, K2)

(a) Adhesive (b) Floating
(c) Semi-adhesive (d) All of the above

6. _____ can be used to reduce seepage losses from ponds. (CO3, K4)

(a) Hypochlorite (b) Carbamide
(c) Bentonite (d) Zeolite

7. Which of the following is an autotroph? (CO4, K3)

(a) Amoeba (b) Diatom
(c) Copepods (d) Rotifer

8. Where would you normally go diving to see a clownfish? (CO4, K3)

(a) Rivers and Estuaries
(b) Corals
(c) Open Ocean
(d) Mangroves

9. The best live food for gold fish brooders is (CO4, K2)

(a) Monia (b) Earthworm
(c) Algae (d) Larvae

10. MPEDA headquarter is located at _____. (CO5, K2)

(a) Mumbai (b) Delhi
(c) Chennai (d) Kochi

Part B (5 × 5 = 25)

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

11. (a) Briefly explain about the aquarium accessories. (CO1, K1)

Or

(b) How do you construct the home aquarium? (CO1, K3)

12. (a) Write about the types of aquaponics systems. (CO2, K2)

Or

(b) Narrate equipment's required for ornamental hatchery. (CO2, K3)

13. (a) What are the different types of marine ornamental fishes? (CO3, K1)

Or

(b) Write about, management practices in ornamental fish hatchery. (CO3, K4)

14. (a) Give a note on health management practices in live feed production. (CO4, K1)

Or

(b) Explain the water quality parameters in aquarium. (CO4, K3)

15. (a) Write a brief account on government subsidies in ornamental fish trade. (CO5, K2)

Or

(b) Write about the present status of ornamental fish trading in India. (CO5, K6)

Part C ($5 \times 8 = 40$)

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

16. (a) Write an essay on the history and status of ornamental fish culture. (CO1, K2)

Or

(b) Write about the different types of aquariums. (CO1, K1)

17. (a) Write about the types, present status, and importance of aquaponics. (CO2, K1)

Or

(b) How do you culture the plant and animal species using aquaponics? (CO2, K4)

18. (a) Write about the equipment and accessories required for ornamental fish hatchery. (CO3, K3)

Or

(b) Describe the feed and health management practices in ornamental fish farm. (CO3, K5)

19. (a) Write an essay on live feed production for aquarium. (CO4, K3)

Or

(b) Give an account on different media used for live feed production. (CO4, K1)

20. (a) Discuss in detail — High value marine ornamental fishes. (CO5, K4)

Or

(b) Describe the role of live feeds in ornamental fish hatcheries. (CO5, K2)

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R3663	Sub. Code
	547303

M.Sc. DEGREE EXAMINATION, NOVEMBER – 2025

Third Semester

Fisheries Science

FISH PROCESSING TECHNOLOGY AND QUALITY ASSURANCE

(CBCS – 2022 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

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

1. After fish death, _____ causes rigor mortis (CO1, K2)
   (a) Depletion of ATP
   (b) Accumulation of glucose in muscle cells
   (c) Increase in muscle oxygen levels
   (d) Release of enzymes from the liver

2. What is the most commonly used method for preserving shrimp after harvesting? (CO1, K2)
   (a) Smoking (b) Freezing
   (c) Canning (d) Drying

3. _____ freezing method is most commonly used for small fish and seafood (CO2, K1)
   (a) Block freezing (b) Air-blast freezing
   (c) Cryogenic freezing (d) Fluidized bed freezing

4. What is the primary benefit of using Styrofoam boxes for packing fish? (CO2, K2)

(a) They are reusable and eco-friendly

(b) They provide good insulation and maintain temperature

(c) They are transparent, allowing for easy inspection

(d) They are inexpensive but highly durable

5. The primary purpose of heating during the fish canning is _____ (CO3, K5)

(a) To enhance the flavor of the fish

(b) To sterilize and kill microorganisms

(c) To increase the shelf life of the fish

(d) To make the fish tender

6. _____ is liquid used in the canning of fish, besides water (CO3, K1)

(a) Vinegar (b) Saltwater or brine

(c) Olive oil (d) Coconut milk

7. Which of the following is a key ingredient in fish silage production? (CO4, K1)

(a) Salt and vinegar (b) Fish by-products

(c) Sugar and water (d) Artificial preservatives

8. The primary source of fish oil from _____ part of the fish. (CO4, K4)

(a) Fish muscle tissue (b) Fish liver

(c) Fish scales (d) Fish bones

9. What does HACCP stand for in the context of food safety? (CO4, K1)

(a) Hazardous and Control Certification Program

(b) Hazard Analysis Critical Control Points

(c) Health and Control of Consumer Products

(d) Hazard Assessment and Control Protocol

10. MPEDA plays a major role in promoting _____ industries (CO5, K5)

(a) Marine tourism

(b) Marine biotechnology

(c) Fish and seafood exports

(d) Fish farming for local markets

Part B (5 × 5 = 25)

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

11. (a) Define rigor mortis of a fish. (CO1, K1)

Or

(b) Discuss the grading of fish after harvesting. (CO1, K6)

12. (a) Demonstrate the irradiation method of fish preservation. (CO2, K2)

Or

(b) Identify the biochemical changes during fish processing. (CO2, K3)

13. (a) Explain the types of canned fish products. (CO3, K5)

Or

(b) Discuss the problem associated with fish canning. (CO3, K6)

14. (a) Explain the production of fishmeal from fishery by-products. (CO4, K2)

Or

(b) Elaborate the extraction of chitin and chitosan from fishery wastes. (CO4, K6)

15. (a) Define the role of USFDA for quality control of fish products. (CO4, K1)

Or

(b) Explain the importance of retail marketing of fishery products. (CO5, K5)

Part C (5 × 8 = 40)

Answer **all** the questions not more that 1000 words each

16. (a) Explain the factors affecting the fish spoilage. (CO1, K2)

Or

(b) Evaluate the post harvesting management strategies of fish and shellfishes. (CO1, K5)

17. (a) Analyze the different types of fish freezing methods. (CO2, K4)

Or

(b) Elaborate the different types of fish packing materials and their importance. (CO2, K6)

18. (a) Demonstrate the process of fish canning method. (CO3, K2)

Or

(b) Discuss the packing of canned fish products. (CO3, K6)

19. (a) Evaluate the method for fish protein hydrolysis. (CO4, K5)

Or

(b) Elaborate the value added products form fishery wastes. (CO4, K6)

20. (a) Examine the good management practice in fish quality control. (CO5, K4)

Or

(b) Demonstrate the logistics management of fish products. (CO5, K2)

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R3664

Sub. Code
547304

M.Sc. DEGREE EXAMINATION, NOVEMBER – 2025

Third Semester

Fisheries Science

RESEARCH METHODOLOGY IN 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. Which statistical software is widely used for research data analysis? (CO1, K1)

   (a) SPSS

   (b) R

   (c) Python

   (d) All of the above

2. If a researcher has 10 papers cited at least 10 times each, their H-index is (CO1, K3)

   (a) 5 (b) 8

   (c) 10 (d) 15

3. Good Laboratory Practices (GLP) are mainly concerned with (CO2, K3)

(a) Ensuring safety in the lab

(b) Maintaining data quality and integrity

(c) Proper instrument calibration

(d) All of the above

4. Beer-Lambert's law relates (CO2, K2)

(a) Absorbance and concentration

(b) Wavelength and density

(c) Frequency and refractive index

(d) Heat and temperature

5. Column chromatography separates molecules based on: (CO3, K3)

(a) Molecular size

(b) Charge

(c) Polarity

(d) All of the above

6. SDS-PAGE is used for separation of (CO3, K4)

(a) DNA

(b) RNA

(c) Proteins

(d) Lipids

7. Confocal microscopy is commonly used for (CO4, K1)

(a) 3D imaging of tissues and cells

(b) Surface metal analysis

(c) DNA sequencing

(d) Viewing bacteria in motion

8. Histology is the study of (CO4, K2)

(a) Cell genetics

(b) Microscopic anatomy of tissues

(c) DNA hybridization

(d) Protein folding

9. Primary data is collected through (CO5, K5)

(a) Surveys and questionnaires

(b) Published reports

(c) Government databases

(d) Textbooks

10. MATLAB is mostly used in fisheries for (CO5, K3)

(a) Population modelling

(b) Numerical simulations

(c) Data visualization

(d) All of the above

Part B ($5 \times 5 = 25$)

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

11. (a) What are primary and secondary data? Give examples. (CO1, K1)

Or

(b) Define mean, median, and mode with suitable examples. (CO1, K2)

12. (a) State the working principle of a pH meter. (CO2, K3)

Or

(b) Differentiate between single-beam and double-beam spectrophotometers. (CO2, K4)

13. (a) Demonstrate centrifugation and state its principle. (CO3, K2)

Or

(b) What is SDS-PAGE and why is it used? (CO3, K2)

14. (a) State the basic principle of phase-contrast microscopy. (CO4, K3)

Or

(b) What is the role of microtomy m histology? (CO4, K1)

15. (a) Differentiate between standard deviation and standard error. (CO5, K3)

Or

(b) Write a brief account on one-way and two-way ANOVA. (CO5, K1)

Part C

(5 × 8 = 40)

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

16. (a) Discuss the process of fisheries catch data collection using field surveys. (CO1, K5)

Or

(b) Explain the types of graphical representation of data with examples. (CO1, K4)

17. (a) Describe the principles of Good Laboratory Practices in detail. (CO2, K2)

Or

(b) Explain the principle, components, and working of a mass spectrometer. (CO2, K3)

18. (a) Describe in detail the working of thin-layer chromatography and its significance. (CO3, K2)

Or

(b) Describe real-time PCR (qPCR) and its role in gene expression studies. (CO3, K1)

19. (a) How do you prepare the biological samples for electron microscopy? (CO4, K3)

Or

(b) Explain the principle, techniques, and applications of histochemistry. (CO4, K2)

20. (a) Discuss the use of correlation and regression in fisheries data analysis. (CO5, K1)

Or

(b) Compare line graphs, bar graphs, and pie charts for fisheries catch analysis. (CO5, K4)

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R3665

Sub. Code
547508

M.Sc. DEGREE EXAMINATION, NOVEMBER – 2025

Third Semester

Fisheries Science

Elective : FISH NUTRITION AND FEED 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 answer.

1. Fishes feeding on single type of food are called as _____ fishes. (CO1, K2)
   (a) Stenophagic (b) Monophagic
   (c) Euryphagic (d) All of the above

2. Probiotics are used as _____. (CO1, K4)
   (a) For disease prevention
   (b) For good health
   (c) Antiviral activity
   (d) All of the above

3. National Fisheries Development Board is located in (CO2, K1)
   (a) Mumbai (b) Delhi
   (c) Chennai (d) Hyderabad

4. The major advantage of encapsulated diet is (CO2, K2)
   (a) Easy to consume
   (b) Water quality is not spoiled
   (c) Specified nutritional
   (d) Easy to handle

5. Which of the following make fish a good source of proteins? (CO3, K1)

(a) Essential fatty acids

(b) Essential amino acids

(c) Non-essential amino acids

(d) All of the above

6. _____ is the necessary elements in fish feed formulation. (CO3, K2)

(a) Protein (b) Vitamin

(c) Minerals (d) All of the above

7. Major storage lipid in fish is (CO4, K1)

(a) Sterols (b) Triglycerides

(c) Phospholipids (d) Glycolipids

8. The most critical amino acid in fish diet is _____. (CO4, K5)

(a) Methionine (b) Arginine

(c) Leucine (d) Lysine

9. What are the advantages of HACCP? (CO5, K2)

(a) Increase food safety standards

(b) Decrease food safety standards

(c) Consumer trust

(d) Increase food safety standards and consumer trust

10. Artemia is also known as (CO5, K1)

(a) Sea lice

(b) Sea monkey

(c) Sea horse

(d) Sea cucumber

Part B (5 × 5 = 25)

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

11. (a) Explain the nutritional requirements of cultivable finfishes. (CO1, K2)

Or

(b) Summarize the role of nutrients in physiology of shell fishes. (CO1, K4)

12. (a) Discuss about isocaloric diets in fish. (CO2, K2)

Or

(b) Discuss about energetic efficiency of fish production. (CO2, K3)

13. (a) How do you purchase the fish feed ingredients? (CO3, K4)

Or

(b) Explain the alternative ingredients to fish proteins and fatty acids. (CO3, K2)

14. (a) What are the different types of fish feed processing? (CO4, K3)

Or

(b) Describe about the significance of pellet milling. (CO4, K1)

15. (a) Outline the importance of floating and semi-floating fish feeds. (CO5, K2)

Or

(b) Write a brief account on raw materials for finfish feed production. (CO5, K1)

Part C

(5 × 8 = 40)

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

16. (a) Explain about the principles of fish nutrition and terminologies. (CO1, K2)

Or

(b) Write an essay on nutritional requirements of shellfish larvae, juveniles and adults. (CO1, K1)

17. (a) Demonstrate the energy requirements of cultivable shellfishes. (CO2, K4)

Or

(b) Outline the mathematical modeling of ingestion of fish feed. (CO2, K2)

18. (a) Describe the quality assurance and quality control in fish feed formulation. (CO3, K1)

Or

(b) Summarize the importance of raw materials for fish feed formulation. (CO3, K2)

19. (a) Give a detailed account on shrimp feed processing. (CO4, K4)

Or

(b) Write about the status of shrimp feed formulation and production. (CO4, K1)

20. (a) Explain about the raw materials for finfish feed processing. (CO5, K5)

Or

(b) Demonstrate the good management practices in fish feed manufacturing industries. (CO5, K2)

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