R0316	Sub. Code 547101

M.Sc. DEGREE EXAMINATION, NOVEMBER – 2023

First Semester

Fisheries Science

INTEGRATED TAXONOMY OF FINFISH AND SHELLFISHES

(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. Which group would have the most number of shared characteristics? (CO1, (K2)

   (a) Organisms in the same Phylum

   (b) Organisms in the same Order

   (c) Organisms in the same Family

   (d) Organisms in the same Kingdom

2. What purpose does taxonomy primarily serve? (CO1, K2)

   (a) To understand genetic inheritance patterns

   (b) To provide a universal way of naming organisms

   (c) To dissect organisms for study

   (d) To predict the evolution of new species

3. Which of the following describes a crustacean that is parasitic (CO2, K2)

(a) Amphipod (b) Isopod

(c) Copepod (d) Decapod

4. The majority of crustaceans belong to which of the following classes? (CO2, K2)

(a) Ostracoda

(b) Malacostraca

(c) Cinipedia

(d) Cephalopoda

5. Which of the following molluscs has a closed circulatory system (CO3, K2)

(a) Chiton

(b) Gastropod

(c) Bivalve

(d) Cephalopod

6. In molluscan taxonomy, how many tentacles does a typical squid possess? (CO3, K2)

(a) Four (b) Six

(c) Eight (d) Ten

7. Which of the following fins helps in maintaining vertical stability in water? (CO4, K2)

(a) Caudal fin (b) Dorsal fin

(c) Pectoral fin (d) Pelvic fin

8. Which group of fishes lack jaws? (CO4, K2)

(a) Osteichthyes (b) Chondrichthyes

(c) Agnatha (d) Placodermi

9. RFLP is a technique that _____ (CO5, K4)

(a) Amplifies specific DNA regions

(b) Cuts DNA at specific sequences

(c) Sequences entire genomes

(d) Translates RNA into protein

10. Mitochondrial DNA is often favored for population genetics due to its ———— (CO5, K4)

(a) Lack of genetic variation

(b) High mutation rate

(c) Presence in the nucleus

(d) Large size compared to nuclear DNA

Part B (5 × 5 = 25)

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

11. (a) Describe the different types nomenclature used in taxonomy. (CO1, K2)

Or

(b) Discuss the importance and method of preserving biological specimens for taxonomic studies.(CO1, K2)

12. (a) Differentiate the characteristics of decapod and amphipod. (CO2, K2)

Or

(b) Distinguish the economic significance of commercially important crustacean species. (CO2, K2)

13. (a) Discuss the role of shell structure in molluscs taxonomy. (CO3, K2)

Or

(b) Infer the taxonomic classification of any five commercially important molluscs species up to the genus level. (CO3, K2)

14. (a) Illustrate the morphometric and meristic characteristic features of finfishes. (CO4, K2)

Or

(b) Summarize the role of key characters in the identification of commercially important finfish species. (CO4, K2)

15. (a) Differentiate between karyotaxonomy and cytotaxonomy. (CO5, K2)

Or

(b) Outline the role of mitochondrial DNA in molecular taxonomy of fish. (CO5, K4)

Part C (5 × 8 = 40)

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

16. (a) Describe the major theories of taxonomy and its significance in classifying the organisms. (CO1, K1)

Or

(b) Explain the role of the National Digital Repository for Museums of India in taxonomy and specimen preservation. (CO1, K2)

17. (a) Summarize the morphometric and meristic characteristics of crustaceans in relation to their ecological adaptations. (CO2, K2)

Or

(b) Illustrate three major taxa of Indian crabs and its taxonomic, morphometric, meristic features. (CO2, K2)

18. (a) Differentiate the characteristics of bivalves, gastropods and cephalopods. (CO3, K2)

Or

(b) Discuss how the morphological features of molluscs reflect their ecological adaptations. (CO3, K2)

19. (a) Explain the major taxa of commercially important finfishes in India, and their key identifying features. (CO4, K2)

Or

(b) Summarize some of the challenges faced by taxonomists in classifying and identifying commercially important finfishes. (CO4, K2)

20. (a) Analyze the potential challenges and limitations faced while using RFLP, RAPO, and AFLP techniques in allozyme analysis. (CO5, K4)

Or

(b) Compare and contrast DNA barcoding and phylogenetic analysis as molecular methods for fish taxonomy. (CO5, K4)

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R0317	Sub. Code
	547102

M.Sc. DEGREE EXAMINATION, NOVEMBER – 2023

First Semester

Fisheries Science

INLAND FISHERIES

(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. India ranks ———— in land fish production. (CO1, K2)

   (a) First (b) Second

   (c) Third (d) Fourth

2. In India fresh water fishery fall in to (CO1, K2)

   (a) One riverine system

   (b) Two riverine system

   (c) Five riverine system

   (d) Seven riverine system

3. The current production from ponds and tanks is (CO2, K2)

   (a) 8.5 million MT

   (b) 10.5 million MT

   (c) 11.5 million MT

   (d) 12.5 million MT

4. Which is the largest man-made lake in India? (CO2, K2)

(a) Chilka

(b) Dal

(c) Sambhar

(d) Govind Vallabh Pant Sagar

5. Beds/oxbow lakes are mostly distributed in (CO3, K2)

(a) Tamilnadu (b) Gujarat

(c) Assam (d) Himachal Pradesh

6. Chilka lake is (CO3, K2)

(a) Lagoon (b) Bhery

(c) Backwater (d) Mangroves

7. Which is largest river system in India? (CO4, K2)

(a) Indus (b) Ganga

(c) Bramhaputra (d) Mahanadi

8. National aquatic animal of India (CO4, K2)

(a) Oil Sardine (b) Indian Mackerel

(c) Tuna (d) Gangetic Dolphin

9. Threatened game fish of (CO5, K2)

(a) Paddle fish (b) Golden Mahaseer

(c) Gar (d) Minnows

10. The cold water fishes adapted to live in water ranges from (CO5, K2)

(a) 5 to 25°C (b) 15 to 30°C

(c) 30 to 50°C (d) 50 to 70°C

Part B (5 × 5 = 25)

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

11. (a) Explain the inland fishery resources in India. (CO1, K2)

Or

(b) Describe in brief the global status of Inland fishery resources. (CO1, K2)

12. (a) Discuss difference between the man-made and natural lakes. (CO2, K2)

Or

(b) Describe the different classification of oxbow lakes. (CO2, K4)

13. (a) Categorise the floodplain wetland (Beel) fisheries in India. (CO3, K4)

Or

(b) Classify the culture and capture based fishery of beels. (CO3, K2)

14. (a) Describe any two exotic species. (CO4, K2)

Or

(b) Compare between lake and reservoir. (CO4, K4)

15. (a) Explain the sport fisheries potential in Himalaya. (CO5, K2)

Or

(b) Discuss in detail about the species of cold water fisheries. (CO5, K6)

Part C (5 × 8 = 40)

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

16. (a) Describe the recommendation on problems and management of Inland fisheries. (CO1, K1)

Or

(b) Explain the role of government and NGO in the Inland fishery development. (CO1, K2)

17. (a) Describe in detail about the major fish composition of fresh water fisheries. (CO2, K2)

Or

(b) Discuss the fish and fisheries of estuaries of the east coast of India. (CO2, K6)

18. (a) Classify the culture based fisheries of open and closed beels. (CO3, K2)

Or

(b) Distinguish different types of floodplain wetlands. (CO3, K4)

19. (a) Explain the Ganga river system and its potential fishery. (CO4, K2)

Or

(b) Summarise the exotic species diversity and compare the merits and demerits of Exotic species. (CO4, K2)

20. (a) Explain the scope and prospects of sport fisheries in India. (CO5, K2)

Or

(b) Discuss in detail about the common sport fishes, fishing tackle and gear used in angling. (CO5, K6)

R0318	Sub. Code
	547103

M.Sc. DEGREE EXAMINATION, NOVEMBER – 2023

First Semester

Fisheries Science

COASTAL AND MARINE FISHERIES

(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. The famous backwaters, which are a chain of brackish lagoons and lakes lying parallel to the Arabian Sea coast, are predominantly found in: (CO1, K2)

   (a) Goa (b) Karnataka

   (c) Kerala (d) Maharashtra

2. Which of the following is the most important brackish water fishery resource in India? (CO1, K2)

   (a) Estuaries (b) Backwaters

   (c) Lagoons (d) Mangroves

3. Which principle aims at sustainable use of fishery resources without depleting them? (CO2, K2)

   (a) Maximum Sustainable Yield (MSY)

   (b) Open Access

   (c) Total Allowable Catch (TAC)

   (d) Zero Growth Harvest

4. What is a primary challenge of managing multi-gear fisheries? (CO2, K2)

(a) Difficulty in breeding

(b) Overlapping fishing zones

(c) Decreased fish demand

(d) Single species focus

5. Which is a growing trend in the fishery sector to combat resource scarcity? (CO3, K2)

(a) Deep-sea trawling

(b) Introduction of alien species

(c) Marine conservation areas

(d) Sustainable aquaculture practices

6. The phenomenon which is associated with climate change, poses a significant threat to calcifying organisms like molluscs and some plankton species? (CO3, K2)

(a) Global warming

(b) Sea-level rise

(c) Ocean acidification

(d) Enhanced storm activity

7. IUU stands for (CO4, K2)

(a) Integrated, Utilized and Unified fishing

(b) Immediate, Unmanaged and Unauthorized fishing

(c) Illegal, Unreported and Unregulated fishing

(d) Indigenous, Utilized and Unified fishing

8. The outer limit of an EEZ typically extends up to how many nautical miles from the coast? (CO4, K2)

(a) 50 nautical miles

(b) 100 nautical miles

(c) 150 nautical miles

(d) 200 nautical miles

9. Which of the following is a primary factor facilitating bioinvasion in aquatic ecosystems? (CO5, K2)

(a) Deforestation

(b) Ballast water from ships

(c) Forest fires

(d) Desertification

10. Which Indian state faced issues with trawler fishing, leading to conflicts between traditional fishermen and trawler operators? (CO5, K2)

(a) Gujarat (b) Odisha

(c) Kerala (d) Goa

Part B (5 × 5 = 25)

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

11. (a) Differentiate between lagoons and backwaters. (CO1, K2)

Or

(b) Explain the role of India in global fisheries. (CO1, K2)

12. (a) Describe the key finfish resources found in brackish water systems in India. (CO2, K2)

Or

(b) Discuss the commercial importance of demersal and pelagic fishes. (CO2, K2)

13. (a) Compute the prospects of culture based systems. (CO3, K3)

Or

(b) Demonstrate the present status of national fishery resources of India. (CO3, K3)

14. (a) Explain the concept and significance of Fisheries co-management. (CO4, K2)

Or

(b) Summarize the importance of EEZ for coastal nations. (CO4, K2)

15. (a) Explain the significance of categorization of species into endangered, indeterminate Extinct species. (CO5, K2)

Or

(b) Discuss on the possible strategies to manage and conserve highly exploited fishery resources. (CO5, K2)

Part C (5 × 8 = 40)

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

16. (a) Describe the ecological dynamics and economic importance of mangroves. (CO1, K1)

Or

(b) Discuss the fisheries resources in lagoons and brackish water impoundments of India. (CO1, K2)

17. (a) Summarize the major conservation strategies employed in fisheries sector. (CO2, K2)

Or

(b) Explain the issues and challenges in managing multi-gear fisheries. (CO2, K2)

18. (a) Show the impact of climate change on fishery resources. (CO3, K3)

Or

(b) Demonstrate the significance of International fishery resources in terms of environmental sustainability and livelihood security. (CO3, K3)

19. (a) Distinguish the role of Inshore, Offshore and High sea fisheries. (CO4, K2)

Or

(b) Discuss the National and International status of IUU fishing. (CO4, K2)

20. (a) Explain in detail about the threats to the coral reefs and strategies to conserve the ecosystem. (CO5)(K2)

Or

(b) Discuss the ecological, economic, and social impacts of bioinvasion in marine ecosystems. (CO5, K2)

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R0319	Sub. Code
	547104

M.Sc. DEGREE EXAMINATION, NOVEMBER – 2023

First Semester

Fisheries Science

FRESHWATER AQUACULTURE

(CBCS – 2022 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

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

1. The following oil cake used to kill the fishes within few hours (CO1, K1)

   (a) Mustard (b) Peanut

   (c) Mahua (d) All the above

2. Choose the following fish which is suitable for fish farming? (CO1, K4)

   (a) Sardine (b) Tuna

   (c) Tilapias (d) All the above

3. Which one of the following is shrimp? (CO2, K3)

   (a) *Macrobrachiumrosenbergii*

   (b) *Mugil cephalus*

   (c) *Penaeus monodon*

   (d) None of the above

4. Hypophysation refers to (CO2, K1)

(a) Eyestalk ablation

(b) Hybridization

(c) Induced breeding with pituitary extracts

(d) All the above

5. Chilka lake is ————————. (CO3, K2)

(a) Backwater (b) Mangrove

(c) Lagoon (d) None of the above

6. Choose the following one that belongs to mackerel (CO3, K4)

(a) Sardinelia (b) Lactarium

(c) Mullet (d) Rastrelliger

7. Which one of the following fish is flying fish? (CO4, K3)

(a) Carangids (b) Scoliodon

(c) Anguilla (d) Exocoetus

8. Name the culture practice adapted for culture of marine fish. (CO4, K1)

(a) Pond Culture (b) Cage culture

(c) Floating raft (d) Pen culture

9. Ichthyoplankton refers to ————————. (CO5, K2)

(a) Larvae of the fish (b) Eggs of the fish

(c) Both (a) and (b) (d) None of the above

10. Aquaponics refers to ————————. (CO5, K5)

(a) Producing plants and aquatic animals together

(b) Producing only plants

(c) Producing only animals

(d) All the above

Part B (5 × 5 = 25)

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

11. (a) Write a brief note on composite fish culture. (CO1, K1)

Or

(b) Describe about semi-intensive fish farming. (CO1, K3)

12. (a) Give a short account on importance of live feed in aquaculture. (CO2, K4)

Or

(b) Write about the water quality management in fish hatcheries. (CO2, K2)

13. (a) How do you select the suitable site for fish hatchery? (CO3, K3)

Or

(b) Give a short account on good management practices in prawn nursery. (CO3, K4)

14. (a) Describe about genetically improved farmed tilapia. (CO4, K3)

Or

(b) Give an account on freshwater pearl culture. (CO4, K3)

15. (a) Describe about aquaphonics and its types. (CO5, K1)

Or

(b) Write a short note on aquaculture waste water treatment methods. (CO5, K1)

Part C (5 × 8 = 40)

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

16. (a) Give a detailed account on different types of freshwater aquaculture system in India. (CO1, K1)

Or

(b) Write an essay on major cultivable freshwater species in India. (CO1, K2)

17. (a) Write a detailed account on broodstock management practices. (CO2, K3)

Or

(b) Explain about commercially important finfish hatchery production. (CO2, K5)

18. (a) Describe in detail – Current global and Indian status of nursery. (CO3, K4)

Or

(b) Explain about the nursery cost analysis for important finfish species. (CO3, K1)

19. (a) Write a detailed account on good prawn farm management practices. (CO4, K3)

Or

(b) Write about the status of freshwater finfish farming in India. (CO4, K5)

20. (a) Describe in detail about the culture of fishes in community ponds. (CO5, K4)

Or

(b) Write an essay on integrated fish farming. (CO5, K3)

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R0320	Sub. Code
	547501

M.Sc. DEGREE EXAMINATION, NOVEMBER – 2023

First Semester

Fisheries Science

Elective – AQUATIC ECOLOGY AND BIODIVERSITY

(CBCS – 2022 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

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

1. Which one of the following is the world largest ecosystem? (CO1, K2)

   (a) River (b) Lake

   (c) Forest (d) Ocean

2. Find out the following ecosystem shows maximum biodiversity. (CO1, K1)

   (a) Estuary (b) Lagoon

   (c) Mangroves (d) Corals

3. Which is the macroalgae? (CO2, K2)

   (a) Phaeophyta (b) Rhodophyta

   (c) Chlorophyta (d) All the above

4. Name the largest mangrove ecosystem. (CO2, K4)

   (a) Bhitarkanika (b) Sunderban

   (c) Pichavaram (d) Muthupet

5. Which one of the following salts cause maximum salinity in seawater? (CO3, K3)

(a) Calcium sulphate (b) Magnesium sulphate

(c) Sodium chloride (d) All the above

6. Zooplankton grouped into one of the following kingdoms (CO3, K2)

(a) Plantae (b) Monera

(c) Animalia (d) Protista

7. All the marine organisms make their shells from calcium and ————————. (CO4, K3)

(a) Chloride (b) Sulfide

(c) Carbonate (d) All the above

8. The leading cause of coral bleaching is (CO4, K3)

(a) Increase in sea surface temperature

(b) Freshwater runoff

(c) Pesticide pollution

(d) Metal pollution

9. Biodiversity is the measure of variation in life at ———————— level . (CO5, K4)

(a) Species (b) Ecosystem

(c) Generic (d) All the above

10. Agar agar is obtained from (CO5, K1)

(a) Chlorella (b) Laminaria

(c) Gracilaria (d) None of the above

Part B (5 × 5 = 25)

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

11. (a) Describe ecological succession. (CO1, K1)

Or

(b) Write about the carrying capacity of aquatic ecosystem. (CO1, K3)

12. (a) Give an account on biological features of reef ecosystem. (CO2, K2)

Or

(b) Write short notes on hydrothermal vent community. (CO2, K4)

13. (a) Explain about vertical migration of zooplankton. (CO3, K3)

Or

(b) Compare and contrast-waves and tides. (CO3, K4)

14. (a) Explain about the ocean acidification. (CO4, K2)

Or

(b) Write a brief account on blue carbon credit. (CO4, K1)

15. (a) What are the factors influencing the aquatic biodiversity? (CO5, K2)

Or

(b) Write about the threats of aquatic biodiversity. (CO5, K3)

Part C (5 × 8 = 40)

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

16. (a) Write a detailed account on various abiotic and biotic components of aquatic ecosystem. (CO1, K2)

Or

(b) Explain about the ecological concepts. (CO1, K1)

17. (a) Describe about the various features of deep-sea ecosystem. (CO2, K3)

Or

(b) Give a detailed notes on classification and biological features on marine ecosystems. (CO2, K5)

18. (a) Describe in detail – role of plankton in aquatic ecosystem. (CO3, K1)

Or

(b) Write a detailed notes on environmental factor influencing the life in ocean. (CO3, K2)

19. (a) Write an essay on global warming and its impact on aquatic ecosystems. (CO4, K4)

Or

(b) Explain in detail with illustration — "biogeochemical cycles". (CO4, K5)

20. (a) Explain about the concept and types of biodiversity. (CO5, K4)

Or

(b) Write a detailed account on global biodiversity pattern and loss of biodiversity. (CO5, K3)

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R0321	Sub. Code
	547301

M.Sc. DEGREE EXAMINATION, NOVEMBER – 2023

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 questions by choosing the correct option.

1. The country where aquaculture was originated (CO1, K3)
   (a) China (b) North Africa
   (c) Japan (d) Indonesia

2. RAS stands for (CO1, K1)
   (a) Recirculation aquariculture system
   (b) Recirculating aquaculture system
   (c) Recirculation agriculture system
   (d) Recirculating agriculture system.

3. What sort of water is used for mariculture? (CO2, K3)
   (a) Chlorinated water (b) Salt water
   (c) Direct rainwater (d) River water

4. The rearing of pearl oysters is usually done in (CO2, K4)
   (a) Cages (b) Tanks
   (c) Encounters (d) Pens

5. Soil preferable for shrimp farming (CO3, K5)

(a) Silty soil (b) Sandy soil

(c) Laterite soil (d) Clay soil

6. HACCP means (CO3, K2)

(a) Hazard Analysis and Critical Control Point

(b) Hazard and Critical Control Point

(c) Hazard And Critical Cooking Point

(d) Hazard Analysis Critical Control Point

7. Octopus belongs to the class ———— (CO4, K5)

(a) Gastropoda (b) Pelecypoda

(c) Cephalopoda (d) Arthropoda

8. Ice-ice disease in seaweed due to (CO4, K3)

(a) Changes of physiochemical parameters

(b) Deficiency of nutrients

(c) Bacterial growth

(d) Fungal growth

9. Scientific name of the Silver Carp is (CO5, K2)

(a) Hypophthalmichthys molitrix

(b) Ctenopharyngodon Idella

(c) Cyprinus carpio

(d) Osteobrama belangeri

10. Gypsum is used in fish pond to (CO5, K3)

(a) Reduce dense algae blooms

(b) Decrease water hardness

(c) Increase turbidity

(d) Increase the dissolved oxygen

Part B (5 × 5 = 25)

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

11. (a) Explain the current status of freshwater aquaculture in India. (CO1, K2)

Or

(b) List any five cultivable shrimps and explain their life cycle. (CO1, K1)

12. (a) Discuss the various uses of sea weeds. (CO2, K6)

Or

(b) Explain the cage culture system. (CO2, K2)

13. (a) Define HACCP and explain its principles. (CO3, K1)

Or

(b) Explain the difficulties in lobster culture. (CO3, K2)

14. (a) Discuss the resources of pearl oysters in Indian seas (CO4, K2)

Or

(b) Describe the diversity of seaweeds available for cultivation. (CO4, K2)

15. (a) Explain the algal culture for fin fish culture. (CO5, K2)

Or

(b) Classify the types of live feed and their management in shrimp farming. (CO5, K4)

Part C (5 × 8 = 40)

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

16. (a) Explain in detail about the developments in brackish water aquaculture. (CO1, K2)

Or

(b) Design and selection of site for shrimp farming. (CO1, K6)

17. (a) Discuss about current global status of mariculture. (CO2, K6)

Or

(b) Elaborate the raft culture and list the suitable fin fish and shellfish species. (CO2, K6)

18. (a) Demonstrate the preparation and management of nursery ponds. (CO3, K2)

Or

(b) Design the shrimp hatchery construction and explain its management. (CO3, K6)

19. (a) Explain the steps involved in pearl farming process. (CO4, K2)

Or

(b) Discuss about advantages and disadvantages in mollusc culture. (CO4, K6)

20. (a) Explain the criteria involved for the construction of fresh water fish farms. (CO5, K2)

Or

(b) Describe the prophylaxis, treatment and disease management in shrimp farming. (CO5, K2)

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R0322	Sub. Code 547302

M.Sc. DEGREE EXAMINATION, NOVEMBER – 2023

Third Semester

Fisheries Science

ORNAMENTAL AQUACULTURE

(CBCS – 2022 onwards)

Time : Three Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

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

1. ———————— being first among ornamental fish producing country. (CO1, K2)

   (a) Malaysia (b) India

   (c) Japan (d) Singapore

2. The ornamental fish which is banned for India is (CO1, K2)

   (a) Piranah (b) Oscar

   (c) Peacock cichlid (d) Discus

3. Aquarium water should be aerated during (CO2, K2)

   (a) Morning (b) Noon

   (c) Evening (d) Night

4. The glass plates of a home aquarium is seald by (CO2, K2)

   (a) Agar glue (b) Polusulfide glue

   (c) Flour glue (d) Silican rubber sealant

5. Breeding traps are generally used for (CO3, K2)

(a) Gold fish (b) Danio

(c) Live bearers (d) Anabantids

6. What is the common name of *Pterophyllum scalar*? (CO3, K2)

(a) Gold fish (b) Angel fish

(c) Oscar (d) Gourami

7. Full form of GDP is (CO4, K2)

(a) Grand decimal point

(b) Gross decimal point

(c) Gross domestic product

(d) Gentle domestic point

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

(a) Monia (b) Earthworm

(c) Algae (d) Larvae

9. Which of the following is having highest ornamental fish export value in India? (CO5, K2)

(a) Kolkata (b) Chennai

(c) Coimbatore (d) Mumbai

10. Which state in India has highest ornamental fish production? (CO5, K2)

(a) Tamil Nadu (b) Maharastra

(c) Manipur (d) West Bengal

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

Answer all the questions not more than 500 words each.

11. (a) Classify the different varieties of aquarium plants and its propagation. (CO1, K4)

Or

(b) Compare the cultivable and capture ornamental fishes. (CO1, K4)

12. (a) Propose the required accessories for cleaning of aquarium tank. (CO2, K6)

Or

(b) Choose the correct method for water filtration and explain an under gravel filter used in aquarium. (CO2, K6)

13. (a) Importance of cross breeding and selective breeding (CO3, K5)

Or

(b) Assess the broodstock management and sexual dimorphisms of gold fish. (CO3, K5)

14. (a) List the phytoplankton and zooplankton live feed species for aquarium fishes (CO4, K3)

Or

(b) Explain the MPEDA regulations for export and import of ornamental fish. (CO4, K5)

15. (a) Discuss the green certification and government subsides (CO5, K5)

Or

(b) Discuss the major countries involved in ornamental fish buying (CO5, K6)

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

Answer all the questions not more than 1000 words each.

16. (a) Explain the information on recent trends of ornamental fish in India. (CO1, K2)

Or

(b) Discuss in details on world trade ornamental fishes and enlist the different varieties of exotic indigenous fishes (CO1, K6)

17. (a) Elaborate the components of ornamental hatchery unit along with important management aspects of ornamental fish hatchery unit (CO2, K6)

Or

(b) Discuss in detail about the setting up of marine reef aquarium (CO2, K6)

18. (a) Evaluate the components and elaborate the important management aspects of ornamental fishes (CO3, K5)

Or

(b) Explain the breeding and farming methods of gold and angel fishes (CO3, K2)

19. (a) Write the use of live feed organisms and formulated feeds in ornamental fish production (CO4, K3)

Or

(b) List the various dry and wet feeds used for ornamental fish production (CO4, K3)

20. (a) Explain the significance of conditioning of fish prior to their transportation. Give the importance of ornamental fish transportation practice. (CO5, K5)

Or

(b) Discuss the high value freshwater and marine ornamental fishes (CO5, K6)

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R0323	Sub. Code 547303

M.Sc. DEGREE EXAMINATION, NOVEMBER – 2023

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 following objective questions by choosing the correct option.

1. Name the organism is used as indicator of fecal pollution in water. (CO1, K1)

   (a) *Bacillus subtilis* (b) Clostridium

   (c) Salmonella (d) *E. coli*

2. Food contamination occur in (CO1, K3)

   (a) Harvesting (b) Cooking

   (c) Transporting (d) All the above

3. Blue Revolution related to ———— (CO2, K2)

   (a) Oil seed production

   (b) Milk production

   (c) Fish production

   (d) None of the above

4. National Fisheries Development Board is present in ———— (CO2, K1)

(a) Goa (b) Kochi

(c) Chennai (d) Hyderabad

5. Fish canning refers to (CO3, K3)

(a) Using a steamer (b) In oven heat

(c) Boiling water bath (d) All the above

6. Cartilaginous fishes are (CO3, K4)

(a) Placoderms (b) Osteichthyes

(c) Chondrichythyes (d) None of the above

7. The global marine fish production is highest in (CO4, K5)

(a) North America (b) Africa

(c) Australia (d) Asia

8. The Indian edible oyster is ———— (CO4, K1)

(a) *Artemia salina* (b) *Brachionus plicatilis*

(c) *Skeleionema costa* (d) *Crassostrea madrasensis*

9. ISO is an abbreviation for (CO5, K3)

(a) International Organization for Standardization

(b) Internet Standard Organization

(c) Indian Standard Organization

(d) None of the above

10. Preservation of fishes using ionizing radiation is called as ———— (CO5, K1)

(a) Irradiation (b) Radicidation

(c) Smoking (d) None of the above

Part B (5 × 5 = 25)

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

11. (a) Write a brief note on types of fish spoilage.(CO1, K1)

Or

(b) Explain about the biochemical changes after the fish death. (CO1, K2)

12. (a) Give a short account on irradiation method of fish preservation. (CO2, K4)

Or

(b) Explain about the quality assurance during fish packing. (CO2, K1)

13. (a) What are the types of canned fish products available? (CO3, K3)

Or

(b) Give a short account on problems related to fish canning. (CO3, K1)

14. (a) Write about the importance of fish meal (CO4, K5)

Or

(b) Explain about value added fish products. CO4, K4

15. (a) Write a brief note on chilled and frozen fish products available in market. (CO5, K5)

Or

(b) What are the role of MPEDA in fish trading? (CO5, K1)

Part C (5 × 8 = 40)

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

16. (a) Write an essay on national and international status of fish processing. (CO1, K1)

Or

(b) Explain post-harvest management of finfish and shellfishes. (CO1, K3)

17. (a) Describe about conventional and modern methods of fish drying. (CO2, K1)

Or

(b) Write an essay on freezing and its types. (CO2, K5)

18. (a) Describe about the various quality assurance procedures during fish packing. (CO3, K3)

Or

(b) Write a detailed notes on history, status, and types of fish canning. (CO3, K5)

19. (a) Explain about various additives and preservatives used in fish processing. (CO4, K1)

Or

(b) Write an essay on fishery By-products. (CO4, K3)

20. (a) Describe about the various organizations involved in QA/QC of fish trading. (CO5, K4)

Or

(b) Write a detailed account on quality control and quality assurance in fish trading. (CO5, K5)

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R0324	Sub. Code 547304

M.Sc. DEGREE EXAMINATION, NOVEMBER – 2023

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 questions by choosing the correct option questions.

1. The primary purpose of conducting a literature survey in research is (CO1, K2)

   (a) To analyze research data

   (b) To prepare transparencies

   (c) To collect research literature

   (d) To calculate the H-index

2. Which of the following steps is known as compilation and presentation of research findings in a structured manner? (CO1, K3)

   (a) Collection of research literature

   (b) Preparation of transparencies

   (c) Oral and visual delivery of results

   (d) Analysis of research data

3. Which instrument is commonly used to measure the concentration of a solution based on the light intensity? (CO2, K4)

(a) Spectrophotometer

(b) FTIR

(c) NMR

(d) AAS

4. FT-IR Spectropholometry used for the analysis of ———— properly of a substance (CO2, K4)

(a) pH level

(b) Vibrational modes of molecules

(c) Mass spectrum

(d) Light intensity

5. The working principle of column chromatography is (CO3, K3)

(a) Ion-exchange

(b) Exclusion principle

(c) Differential adsorption

(d) None of the above

6. The technique involves the transfer of nucleic acids or proteins from a gel to a membrane is called (CO3, K1)

(a) Centrifugation

(b) PCR

(c) Blotting techniques

(d) Microarray techniques

7. Which type of microscopy is commonly used to observe thick specimens with a three-dimensional appearance and provides a black background? (CO4, K4)

(a) Bright field microscopy

(b) Phase contrast microscopy

(c) Dark field microscopy

(d) Confocal microscopy

8. Histochemistry is primarily concerned with ———— (CO4, K4)

(a) Studying the interaction between antibodics and antigens

(b) Using radioactive isotopes to label molecules

(c) Applying chemical techniques to identify specific tissue components

(d) Staining specimens for electron microscopy

9. Which probability distribution is commonly used to model rare events? (CO5, K5)

(a) Normal distribution

(b) Binomial distribution

(c) Poisson distribution

(d) Exponential distribution

10. An analysis is used to determine the significant difference between the means of three or more independent groups? (CO5, K5)

(a) One-way ANOVA

(b) Two-way ANOVA

(c) Student's t-test

(d) Chi-square test

Part B (5 × 5 = 25)

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

11. (a) Demonstrate collection of research articles. (CO1, K2)

Or

(b) Discuss about research ethics (CO1, K6)

12. (a) Compare normality and molarity of chemicals. (CO2, K4)

Or

(b) Illustrate the working principle of pH meter. (CO2, K2)

13. (a) Classify the ELISA techniques. (CO3, K2)

Or

(b) Examine the types of centrifuges and their applications. (CO3, K4)

14. (a) Infer the working principle of Phase contrast microscope. (CO4, K2)

Or

(b) List the applications of histology and histochemistry. (CO4, K4)

15. (a) Justify biostatistics is a potential tool in biological research. (CO5, K5)

Or

(b) Interpret the degree of correlation. (CO5, K5)

Part C (5 × 8 = 40)

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

16. (a) Design a research project with necessary components. (CO1, K6)

Or

(b) Elaborate research databases and their applications. (CO1, K6)

17. (a) Examine the essential good laboratory practices. (CO2, K4)

Or

(b) Explain the working principles of Fourier transmission and Infrared spectrophotometers. (CO2, K2)

18. (a) Classify the types of chromatography. (CO3, K4)

Or

(b) Demonstrate the working process of RT-PCR. (CO3, K2)

19. (a) Explain the features of different types of light microscopy. (CO4, K5)

Or

(b) Illustrate the working mechanism of SEM and its biological applications. (CO4, K2)

20. (a) Evaluate the applications of measurement of central tendency. (CO5, K5)

Or

(b) Explain the steps involved in One-Way ANOVA. (CO5, K5)

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R0325	Sub. Code
	547509

M.Sc. DEGREE EXAMINATION, NOVEMBER – 2023

Third Semester

Fisheries Science

Elective: INTEGRATED FISH FARMING

(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. Which is a primary concern when transitioning from a monoculture to a polyculture system in aquaculture? (CO1, K3)

   (a) Trophic level optimization

   (b) Species compatibility and competition

   (c) Salinity management

   (d) Water temperature consistency

2. What is a primary advantage of running water systems in aquaculture? (CO1, K3)

   (a) It supports the growth of multiple fish species.

   (b) It ensures water remains stagnant.

   (c) It provides consistent oxygenation and efficient waste removal.

   (d) It reduces the need for feeding the fish.

3. Which crop is not typically integrated with fish farming? (CO2, K5)

(a) Rice (b) Tomatoes

(c) Wheat (d) Lettuce

4. Which is a primary horticulture crop for integrated fish farming? (CO2, K5)

(a) Potatoes (b) Wheat

(c) Watermelon (d) Spinach

5. Sericulture, when integrated with aquaculture, may pose which potential challenge? (CO3, K4)

(a) Over-oxygenation of water from silkworm activity.

(b) Disruption of the aquatic ecosystem due to silk deposition.

(c) Elevated nutrient levels from silkworm waste leading to potential eutrophication.

(d) Silkworms may consume aquatic plants, depleting resources for fish.

6. Which livestock's waste is considered a potential vector for introducing harmful parasites to fish in integrated farming systems? (CO3, K4)

(a) Cattle (b) Poultry

(c) Pigs (d) Goats

7. Which is a primary ecological advantage of integrated fish fanning systems? (CO4, K3)

(a) Reduction in the need for artificial feeds.

(b) Enhanced resistance of fish to diseases.

(c) Increased diversity of fish species in ponds.

(d) Effective recycling of nutrients and organic matter.

8. In an integrated aquaculture - agriculture system, how might crops directly benefit fish? (CO4, K3)

(a) By shading and thus reducing water temperature fluctuations

(b) By increasing pond water temperature

(c) By acting as direct food sources for fish

(d) By increasing water pH levels

9. In aquaponics, which factor plays a crucial role in determining the suitable plant species? (CO5, K5)

(a) Taste preferences of consumers

(b) Compatibility with fish diet

(c) Tolerance to the nutrient-rich water environment

(d) Resistance to pests common in aquaculture

10. Which component in aquaponics systems facilitates the conversion of fish waste into nutrients for plants? (CO5, K5)

(a) Decomposer organisms

(b) UV light filters

(c) Nitrifying bacteria

(d) Aeration pumps

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

Answer all the questions not more than 500 words each.

11. (a) Compute the primary considerations when setting up a coastal aquaculture system. (CO1, K3)

Or

(b) Demonstrate the operational details of running water systems in coastal aquaculture and their impotance. (CO1, K3)

12. (a) Recommend the list of agricultural crops suitable for the integrated farming and provide the reasons. (CO2, K5)

Or

(b) Evaluate the different farming systems used to cultivate economically important crops. (CO2, K5)

13. (a) Distinguish the economic importance of sericulture. (CO3, K4)

Or

(b) Outline the history and evolution of integrated fish farming in the National and International level. (CO3, K4)

14. (a) Demonstrate the role epiculture in integrated fish farming. (CO4, K3)

Or

(b) Present the important criteria when integrating poultry with aquaculture. (CO4, K3)

15. (a) Judge the effectiveness of aquaponics as a solution to urban farming challenges. (CO5, K5)

Or

(b) Critique the suitability of nutrient film technique for larger scale commercial aquaponics. (CO5, K5)

Part C (5 × 8 = 40)

Answer all the questions not more than 1000 words each.

16. (a) Classify the different types of integrated farming systems in aquaculture and discuss their benefits and challenges. (CO1, K3)

Or

(b) Construct the design for monoculture, composite fish culture and polyculture systems in aquaculture and discuss the advantages and disadvantages of each system. (CO1, K3)

17. (a) Estimate the significance of mushroom cultivation in an integrated production system. (CO2, K2)

Or

(b) Evaluate the role of horticulture crops integrated fish farming. (CO2, K2)

18. (a) Investigate the challenges and potential problems of integrating piggery with fish farming systems. (CO3, K4)

Or

(b) Examine the economic importance of integrating animal husbandry with other agricultural practices. (CO3, K2)

19. (a) Compute the cost analysis required to set up an integrated fish farming system. (CO4, K3)

Or

(b) Discuss the challenges and benefits of integrating aquaculture with traditional agriculture. (CO4, K2)

20. (a) Evaluate the different types of aquaponics systems for commercial scale production. (CO5, K5)

Or

(b) Estimate the financial aspects of establishing and running an aquaponics system. (CO5, K5)

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