

**Chattogram Veterinary and Animal Sciences University, Chattogram**

**Faculty of Fisheries**

**B. Sc. Fisheries (Hons.), Year-03, Semester-02 (July-December), Final Examination' 2021**

Course Code: FPT-302(T), Course Title: Fishery Products Technology (Theory)

Total Marks: 70, Time: 3 hours

Answer any **5 (five)** questions from each section. Figures in the right margin indicate full mark. Use separate answer script for each section.

**Section-A**

1. a) Differentiate between mince and surimi. 2  
b) How can you measure the gel strength of surimi? 3  
c) Enlist the name of 5(five) cryoprotectants used to prepare surimi-based products with their functions. 2
2. a) What are the major constraints of seaweed culture in Bangladesh? Do you think seaweed culture would be profitable in Bangladesh? 3  
b) Discuss the production procedure of one product produced from brown seaweed. 4
3. a) Define fish fermentation. How will you process 'Nga-pi'? 3  
b) Prepare a complete list of shrimp-based products exported from Bangladesh. 4
4. a) Write down the production process of fish meal by wet rendering method. 3  
b) Write in brief the scientific and technological development of dried fishery products in Bangladesh. 4
5. a) Write down the grading specification for seawater headless shell on shrimp. 2  
b) How will you compare among different fish salting techniques used in Bangladesh? 3  
c) How impurities of salt affect the quality of salted products? 2
6. a) Differentiate between fishery products and by-products. 3  
b) Define cool chain. Give your suggestions on cool chain management to ensure quality of fishery products. 4
7. a) Why fish insulin is better than cattle insulin? 2  
b) Differentiate between FPC and FPH. 2  
c) How can you prepare FPC from fishery waste? 3

**Section-B**

8. a) Briefly describe the methods of conventional shrimp smoking practiced in Bangladesh. 3  
b) Give your suggestions to increase the shelf life of smoked fishery products. 2  
c) What are the main features of fishery by-products for production of value added products? 2
9. a) Write down the production procedure of salmon canned products. 4  
b) Write the flowchart of caviar production process. 3
10. a) Discuss the production procedure of fish sauce with the characteristics and nutritive value. 3  
b) Differentiate between fermented and semi fermented fishery products. 2  
c) Classify fermented fishery products. 2
11. a) Define "Fishery Products Technology". How can you apply your knowledge of "Fishery Products Technology" in the field? 4  
b) Prepare a list of wet fish and fishery products marketed domestically in Bangladesh. 3
12. a) What is browning / blacking of frozen prawns? Write down its preventive measures. 3  
b) Write down the commercial manufacturing process of BT-IQF 4
13. a) Write down the principles of fish canning. State the prospects of fish canning in Bangladesh. 4  
b) What is ripening of a salted fish? Write down the merits and demerits of dry salting of fish. 3
14. Write short notes on **any two** of the following: 3.5x2=7  
a) IQF and semi IQF; b) Isinglass and ambergris and; c) Fish glue



**Chattogram Veterinary and Animal Sciences University, Chattogram**  
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**B. Sc. Fisheries (Hons.) Year -3 Semester-2 (July-December) Final Examination, 2021**  
**Course Code: ABM-302 (T), Course Title: Agribusiness and Marketing (Theory)**  
**Total Marks: 70, Time: 3 hours**

*Answer any **3 (Three)** questions from each section where question no. **1 and 5** are mandatory. Figures in the right margin indicate full mark. Use separate answer script for each section.*

**Section-A**

- |    |    |   |   |
|----|----|---|---|
| 1. | a) | Discuss the basic concept of business and agribusiness.   | 3 |
|    | b) | Briefly describe the role of agribusiness in the economic development of a country.                 | 4 |
|    | c) | Compare the characteristics of Sole proprietorship and Partnership.                                 | 4 |
| 2. | a) | Explain planning along with its characteristics.  | 5 |
|    | b) | What are the different types of plans?  | 3 |
|    | c) | Why is organizing of a business important for any organization?                                     | 4 |
| 3. |    | Suppose you are the Human Resource Manager of an organization of process fish.                      |   |
|    | a) | Explain the factors that you will consider while hiring the marketing manager of that organization. | 4 |
|    | b) | Propose some techniques for motivating the employees of an organization.                            | 4 |
|    | c) | What are different types of leadership style. Narrate them briefly.                                 | 4 |
| 4. | a) | Define entrepreneurship and aqua entrepreneurship with their importance.                            | 4 |
|    | b) | What are the barriers of aqua entrepreneurship?   | 4 |
|    | c) | Narrate the characteristics of successful entrepreneurs.  | 4 |

**Section-B**

- |    |    |  |    |
|----|----|--|----|
| 5. |    | Suppose you are working as a marketing manager at a company in the processed fish industry. Your company wants to launch a seafood restaurant in Chattogram. Develop a hypothetical marketing plan for your company. | 11 |
| 6. | a) | Define management.   | 2  |
|    | b) | What are the general functions of management? Narrate any two of them.   | 4  |
|    | c) | List the 14 principles of management proposed by Henry Fayol. Explain any four of them.  | 6  |
| 7. | a) | What do you mean marketing of fish product? What are the challenges of it?   | 4  |
|    | b) | What are the features of an efficient market system?   | 4  |
|    | c) | Draw a value chain of fish marketing system.   | 4  |
| 8. | a) | Define marketing, marketing management, satisfaction and value.  | 4  |
|    | b) | Define 'Marketing Mix'. Why is 'Marketing Mix' very important for the success of a manager?  | 4  |
|    | c) | What do you mean by "Product Concept" of marketing? Explain with example.  | 4  |



**Chattogram Veterinary and Animal Sciences University, Chattogram**

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B. Sc. Fisheries (Hons.) Year -03 Semester-02, Final Examination' 2021

Course Code: **MFM-302 (T)**, Course Title: **Marine Fisheries Management (Theory)**

Total Marks: 70, Time: 3 hours

*Answer any **5 (five)** questions from each section. Figures in the right margin indicate full mark. Use separate answer script for each section.*

**Section-A**

1. a) What do you mean by marine fisheries management? 2  
b) Diagrammatically describe the maritime boundary of Bangladesh. 3  
c) What is the use of MSY and MEY in fisheries management? 2
2. a) What do you understand by sustainability in fisheries system? 2  
b) Write down the steps involved in assessing sustainability in fisheries. 2  
c) Briefly discuss the fundamental components for fisheries sustainability. 3
3. a) What is "efficiency" in fisheries management? 1  
b) Distinguish between offshore fishing and inshore fishing. 3  
c) Why IUU fishing activities are major threats in world marine fisheries management? 3
4. a) Compare between active gear and passive gear. 2  
b) Why ESN and MSN are considered as destructive fishing gear? 2  
c) Classify the gears used in commercial fishing in Bangladesh. 3
5. a) What are TAC and CBFM? 2  
b) Discuss the major issues and challenges of implementing input control and output control in artisanal fisheries of the Bay of Bengal in Bangladesh. 5
6. a) Classify data used in fisheries management? 2  
b) Point out probability sampling techniques used for data collection for marine fisheries management. 5
7. a) Define closed season studies. Write down the name of hilsha fish species found in the Bay of Bengal. 3  
b) Mention the name, area boundary and ban periods of sanctuaries of hilsha fish in Bangladesh. 4

**Section-B**

8. a) Give an overview on the present trend of marine capture fisheries? 3  
b) Compare among the ecologically sensitive area, ecologically critical area and marine protected area. 4
9. a) What are the basic assumptions of "Surplus yield model"? 3  
b) Define Virtual Population Analysis (VPA). Write down the steps necessary for VPA. 4
10. a) Why square meshed nets are preferred for effort management? 3  
b) Explain the major challenges arise in implementing fishing effort and catch management. 4
11. a) What is gear selectivity? Construct the equation of gear selectivity. 3  
b) Assemble the different types of parameters used in gear selectivity. 4
12. a) Write down FAO Code of Conduct for Responsible Fisheries with its nature and scope. 3  
b) Describe important features of Marine Fisheries Ordinance 1983? 4
13. a) What is straddling fish stock and migratory fish stock? 2  
b) Write down the present management practices of Hilsha in Bangladesh. 2  
c) What measures do you recommend to enrich Hilsha Stock in Bangladesh? 3
14. Write short notes on **any two** of the following: 3.5×2= 7  
a) Poaching; b) Mortality & catch curve; and c) Fisheries Enhancement Program.



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B. Sc. Fisheries (Hons.) Year -03 Semester-02, Final Examination' 2021

Course Code: **CCF-302 (T)**, Course Title: **Climate Change and Fisheries (Theory)**

Total Marks: 70, Time: 3 hours

*Answer any 5 (five) questions from each section. Figures in the right margin indicate full mark. Use separate answer script for each section.*

**Section-A**

1. a) What do you mean by climate, climate change and climate variability? 3.0  
b) What are the major causes of climate change? 2.0  
c) How is Bangladesh vulnerable to climate change? 2.0
2. a) How does climate change alter salinity, density and stratification of the oceans? 4.0  
b) What are the predicted changes and expected impacts of Sea Level Rise on coastal fisheries? 3.0
3. a) Define global negotiation. Write down the rules of global negotiating. 3.0  
b) What does MRV stands for? Discuss its role in the light of 'Copenhagen Accord'. 4.0
4. a) Describe the impacts of extreme events on the emerging economy of Bangladesh. 3.0  
b) Describe the advancement pattern of Bangladesh in meeting the direct and relative impacts of climate change with example. 4.0
5. a) Give a brief outline about the formation and responsibility of IPCC. 3.0  
b) How do institutional policies can help in mitigating climatic challenges? 2.0  
c) How does aquaculture contribute to climate change? 2.0
6. a) "Supply of different feed ingredients for preparing fish feed are decreased by climate change"- Explain this statement. 2.0  
b) Write down the significance of aquaculture on global food fish production. 3.0  
c) What types of adaptation measure are needed for aquaculture due to negative climate? 2.0
7. a) "Only temperature fluctuations helps to affect wide range of physiological processes on fish"- Justify. 3.0  
b) Develop a comparison on the impacts of primary and secondary productivity due to climate change. 4.0

**Section B**

8. a) What happens if the world heats up more drastically? 2.0  
b) "Predictions of future climate are imperfect"- Explain this statement. 2.0  
c) Relate between climate change and green house effect. 3.0
9. a) What is 'bio-climate envelope'? Mention its uses. 2.0  
b) Name the hypotheses that relate marine fish recruitment. Illustrate the Oscillating Control Hypothesis. 5.0
10. a) Differentiate between food web. 1.0  
b) How does climate change impact on aquatic food webs? 3.0  
c) What kind of adaptation strategies could be undertaken to reduce climate change impacts on inland capture fisheries and related livelihoods? 3.0
11. a) Differentiate between artisanal fisheries and large scale fisheries. 2.0  
b) Develop a comparison on the impacts of culture and capture fisheries due to climate change. 5.0
12. a) Define adaptation response in climate science. 2.0  
b) Enlist the factors responsible for successful adaptive capacity in Asia with special emphasize in the context of Bangladesh. 2.0  
c) Provide your possible suggestions to achieve such factors in favorable conditions. 3.0
13. a) How integrated aquaculture is affected by global warming? 3.0  
b) Discuss the potential positive impacts of climate change in fisheries sector. 4.0
14. Write short notes on **any 2** of the following: 3.5x2=7.0  
a) Greenhouse effects; b) Climate change and spawning of fish;  
c) Early warning systems of climate change; and d) Match-mismatch hypothesis.



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B.Sc. Fisheries (Hons.) Year -3, Semester -2 (July-December) Final Examination, 2021

Course Code: **FPH 302 (T)**, Course Title: **Fish Pharmacology (Theory)**

Total Marks: 70

Time: 3 hours

*Answer any **5 (five)** questions from each section. Figures in the right margin indicate full mark. Use separate answer script for each section.*

**Section-A**

1. a) Define and classify pharmacology. 3  
b) Briefly describe the scope and prospects of studying fish pharmacology in the field of aquaculture. 4
2. a) Define drug and medicine. 3  
b) Discuss major sources of drugs. Write down the properties of an ideal drug. 4
3. a) Define withdrawal period. Why is it important to know withdrawal period of a drug? 3  
b) Write down the mechanisms of drug resistance in aquatic animal. 4
4. a) Differentiate among immersion, flash and bath treatment. 3  
b) Write down the name of some commercial steroids and estrogens to induce sex reversal with their target fish species. 4
5. a) Define antibiotic. 2  
b) Describe major groups of antibiotics with their sources and mechanism of actions. 5
6. a) Distinguish between non-receptor mediated and receptor mediated drug action. 3  
b) Discuss the factors that may affect the dose and action of drugs in aquaculture 4
7. Write short notes on **any two** of the following: 3.5x2=7  
a) Drug laws; b) Therapeutic index and c) Drug metabolism in fish

**Section B**

8. a) Categorize aqua drugs available in Bangladesh based on their purpose of uses. 3  
b) Write down the principles of using aqua drugs. 4
9. a) What are the positive and negative impacts of aqua drugs? 3  
b) Briefly describe the benefits of using probiotics in aquaculture production. 4
10. a) What do you know about the abuse of aqua drugs and its effect? 3  
b) Illustrate dose-response relationships in case of aquaculture drug use. 4
11. a) Define anaesthesia. Name four anaesthetics used in fish. 3  
b) Mention the stages of anaesthesia in fish. 4
12. a) What do you mean by routes of drug administration? Enlist the factors that may affect the routes of drug administration. 4  
b) Illustrate different types of local routes of drug administration. 3
13. a) What do you mean by bioavailability of drugs? Write down the importance of bioavailability of drugs. 3  
b) Write down various factors affecting bioavailability. 4
14. Write short notes on **any two** of the following: 3.5x2=7  
a) Vaccination for fish health management; b) Pharmacodynamics and c) Pharmacokinetics



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B. Sc. Fisheries (Hons.) Year -03 Semester-02, Final Examination' 2021

Course Code: **ABC-302 (T)**, Course Title: **Aquatic Biodiversity and Conservation (Theory)**

Total Marks: 70, Time: 3 hours

Answer any **5 (five)** questions from each section. Figures in the right margin indicate full mark. Use separate answer script for each section.

**Section-A**

1. a) Define biodiversity. 1.0  
b) What are the links between biodiversity and ecosystem? 2.0  
c) Write down the economic and ecological importance of aquatic biodiversity. 4.0
2. a) What are the advantages of *ex-situ* conservation? 3.0  
b) Describe different *in-situ* ways of fisheries conservation. 4.0
3. a) Why does biodiversity degrade day by day? 2.0  
b) 'Establishment of fish sanctuary is the best way of fish conservation in nature' – justify. 2.0  
c) Why should fisheries expert more focus on ecological values than its economic values? 3.0
4. a) What do you mean by protected area? 1.0  
b) Differentiate between national park and game reserve. 2.0  
c) Write down the IUCN global categories of red list. 4.0
5. a) Define Small Indigenous Species (SIS). 1.0  
b) What do you know about the economic and ecological value of SIS? 3.0  
c) Describe the reasons behind SIS degradation. 3.0
6. a) What do you mean by exotic and alien species? 2.0  
b) Do you think introducing exotic species could destroy a local biodiversity? – Explain. 2.0  
c) What are the precautionary measures needed to be taken to introduce an exotic species into local variety? 3.0
7. a) Why it is necessary to estimate the biodiversity? 1.0  
b) Describe "Shannon-Wiener Index" as a method of biodiversity assessment. 4.0  
c) What is the difference between Simpson index" and "Shannon-Wiener Index"? 2.0

**Section B**

8. a) What is difference between alpha, beta and gamma diversity? 3.0  
b) What are the anthropogenic causes of aquatic biodiversity loss in Bangladesh? 4.0
9. a) How can biodiversity conservation help with climate change adaptations? 3.0  
b) 'Exotic fishes are effective means of utilizing vacant niches' – to what extent you agree or disagree with this statement. 4.0
10. a) Why *ex-situ* conservation is called long term conservation? – Explain. 3.0  
b) What are the benefits of Ecosystem Based Management over other management tools to conserve biodiversity? 4.0
11. a) What is cryopreservation? 1.0  
b) How natural breeding can be enhanced through restoration of habitats? 3.0  
c) Illustrate the notified protected areas of Bangladesh in a map. 3.0
12. a) Define 'survey', 'surveillance' and 'monitoring'. 2.0  
b) What are the characteristics of a vulnerable species? 2.0  
c) Write down the ecological and biological principles in fish conservation. 3.0
13. a) What do you understand by blue growth initiative? 1.0  
b) How does plastic pollution affect aquatic biodiversity? 3.0  
c) Develop a management plan to overcome plastic pollution in waterbody to save aquatic biodiversity. 3.0
14. a) What do you mean by ecotourism? 1.0  
b) What are the objectives of IUCN red list? 3.0  
c) Why IUCN red list is called a key conservation tool? 3.0



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- B. Sc. Fisheries (Hons.) Year -03, Semester-02 (July-December) Final Examination' 2021  
Course Code: **MBE-302 (T)**, Course Title: **Molecular Biology and Embryology (Theory)**  
Total Marks: 70 Time: 3 hours

Answer any 5 (five) questions from each section from the followings. Illustrate your answer wherever necessary.

Figures in the right margin indicate full mark. Use separate answer script for each section.

**Section-A**

1. a) Define the central dogma of life. 2.0  
b) What is codon? Enlist the genetic codes of essential amino acids. 2.0  
c) 'Molecular biology: an emerging field of biological sciences'-explain. 3.0
2. a) What are the major features of DNA replication? 2.0  
b) Illustrate the mechanism of DNA replication with appropriate diagram. 5.0
3. a) Diagrammatically show the structure of a DNA molecule. 2.0  
b) Write down the properties of DNA. How does RNA differ from DNA? 5.0
4. a) Define and classify operon. 2.0  
b) Briefly describe the mechanism of controlling gene expression in prokaryotes. 5.0
5. a) What is gene regulation? Why gene regulation is necessary? 3.0  
b) How *trp* operon regulates the gene expression? 4.0
6. a) Illustrate the roles of  $Ca^{2+}$  in egg activation. 4.0  
b) Briefly describe the morphology of a teleost egg. 3.0
7. a) Illustrate the cleavage found in *Amia*, *Acipenser* and *Lepidosteus*. 3.0  
b) Briefly discuss the spiral cleavage with appropriate figure. 4.0

**Section-B**

8. a) Discuss the protein synthesis in eukaryotic cell. 4.0  
b) What do you know about the post transcriptional modification of mRNA transcript? 3.0
9. a) What do you know about codon and anticodon? 2.0  
b) Write down the functions of lacZ, lacY, and lacA. 2.0  
c) Differentiate between the followings: enhancer and silencer, monocistronic mRNA and polycistronic mRNA. 3.0
10. a) What is translation? Give an example of initiation codon, anti-codon and stop codon that are associated with translation. 2.0  
b) Briefly describe how a DNA is transcribed into RNA. 5.0
11. a) Define cleavage and blastulation. 2.0  
b) 'Eggs are classified based on the amount of yolk'- explain. 3.0  
c) Differentiate between holoblastic cleavage and meroblastic cleavage. 2.0
12. a) Define organogenesis. 1.0  
b) 'Organogenesis begins with the development of nervous system'- explain. 3.0  
c) Schematically show the fate of germ layers forms at gastrulation. 3.0
13. a) 'Gonad is a mixed gland'- explain. 2.0  
b) How can you classify the ovary based on egg maturation? 2.0  
c) Describe the urinogenital systems of *Mobula japonica*. 3.0
14. a) What is gamete? 2.0  
b) Describe the process of oogenesis in fish. 5.0



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B.Sc. Fisheries (Hons.) Year -3, Semester -2 (July-December), Final Examination, 2021

Course Code: AEN 302 (T), Course Title: Aquaculture Engineering (Theory)

Total Marks: 70, Time: 3 hours

*Answer any 5 (five) questions from each section. Figures in the right margin indicate full mark. Use separate answer script for each section.*

**Section-A**

1. a) What do you mean about 'aquaculture engineering' and 'aquaculture system'? 3  
b) Write down the site selection criteria for aquafarm. 4
2. a) Discuss the characteristics of pond dikes. 3  
b) How will you calculate the dike height of a shrimp pond? 4
3. a) What is bio-filter? 2  
b) Briefly describe the preparation of bio-filter for a prawn hatchery. 5
4. a) What do you understand by 'Integrated multi-trophic aquaculture'? 3  
b) Explain the planning process of a large scale semi-intensive aquafarm in Bangladesh. 4
5. a) Briefly describe the components of sluice gate in coastal aquaculture pond 5  
b) Write down the advantage and disadvantages of sluice gate in aquafarm. 5
6. a) What do you mean by specialized aquaculture system? 3  
b) Briefly discuss about the principles of engineering in aspect of fish-farm construction. 4
7. Write short notes on **any two** of the following: 3.5x2=7  
a) Raceway aquaculture system; b) Cage culture and c) Pen culture

**Section B**

8. a) Differentiate among aquaculture systems based on the intensity of culture. 3  
b) In 1-acre fish pond, a farmer wants to stock different layer fish maintaining a ratio of Rui: Catla: (Mrigal+ Black carp+ Common carp): Silver carp: Grass carp: Prawn = 30:35:15:5:5:10. What will be the stocking density of each fish species? (Pond depth=4ft) 4
9. a) Why wastewater treatment is important in Bangladesh? 3  
b) Briefly describe the waste management system of re-circulatory aquaculture system. 4
10. a) What are the key characteristics of a monk? 3  
b) Why dam height, thickness and side slopes should consider during pond construction? 4
11. a) Explain the concept of "Race-way aquaculture system" 3  
b) "Domestication is the first step of artificial breeding"-explain. 4
12. a) Illustrate the principle of Biofloc aquaculture system. 4  
b) Briefly describe the solid management strategies of Biofloc aquaculture system. 3
13. a) Between series and parallel raceway aquaculture system which one is more cost effective? Why? 3  
b) Develop a raceway fish farm model for a commercial aquafarm. 4
14. Write short notes on **any two** of the following: 3.5x2=7  
a) Recirculating aquaculture system; b) Organic aquaculture and c) Integrated aquaculture system