

**Chattogram Veterinary and Animal Sciences University, Chattogram**  
**Department of Aquaculture**  
**MS in Aquaculture**

July- December Semester Final Examination/2025

Course Code and Title: **AQP – 502, Aquatic Pathology (T)**

Total Marks: 40, Time: 2 hours

*Answer any **04 (four)** questions. Figures in the right margin indicate full marks.*

- |    |    |                                                                                                                                    |   |
|----|----|------------------------------------------------------------------------------------------------------------------------------------|---|
| 1. | a) | What do you mean by aquatic Pathology? Write down the main brunches of pathology with its application in aquaculture.              | 4 |
|    | b) | Distinguish between infectious and non-infectious diseases in fish?                                                                | 4 |
|    | c) | Give your concept on systemic pathology of fish with examples.                                                                     | 2 |
| 2. | a) | Define pathogenicity of a pathogen with example. Enlist some bacterial, viral and fungal fish pathogens reported from aquaculture. | 4 |
|    | b) | Describe the renal pathology of fish produced through infection and disease.                                                       | 3 |
|    | c) | Describe the factors and mechanism involved in the bacterial diseases in fish.                                                     | 3 |
| 3. | a) | What are the factors that can produce mycotic disease in fish?                                                                     | 3 |
|    | b) | Compare between enveloped and non-enveloped fish viruses with their characteristics and examples.                                  | 4 |
|    | c) | Describe the causative agent, epizootiology, symptoms, pathology and diagnosis of SVC in fish.                                     | 3 |
| 4. | a) | What is shellfish pathology?                                                                                                       | 4 |
|    | b) | Enlist some pathogens along with respective pathological changes in farmed shellfish species.                                      | 3 |
|    | c) | How can the environmental stressors affect shellfish health in aquaculture?                                                        | 3 |
| 5. | a) | What do you know about fish diseases caused by the environmental factors?                                                          | 3 |
|    | b) | Mention the deficiency signs of various nutrients in fish with appropriate preventive and control measures.                        | 4 |
|    | c) | How can you reduce and prevent stress in aquaculture candidates?                                                                   | 3 |

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MS in Aquaculture

July- December Semester Final Examination/2025

Course Code and Title: **AQI – 502, Aquatic Immunology (T)**

Total Marks: 40, Time: 2 hours

*Answer any **04 (four)** questions. Figures in the right margin indicate full marks.*

- |    |               |                                                                                                                           |                |
|----|---------------|---------------------------------------------------------------------------------------------------------------------------|----------------|
| 1. | a)            | Define immunology and aquatic immunology. Mention the main branches and importance of immunology studies for aquaculture. | 2              |
|    | b)            | Give an idea about the main functions of immune system.                                                                   | 4              |
|    | c)            | What do you know about immunodiagnostic techniques used in aquaculture?                                                   | 4              |
| 2. | a)            | Distinguish between specific and non-specific immunity.                                                                   | 4              |
|    | b)            | Why the adaptive immunity is only present in fish not in shrimp?                                                          | 3              |
|    | c)            | Discuss about polyclonal and monoclonal antibody production techniques .                                                  | 3              |
| 3. | a)            | What is your concept about the haemolymph and haemocyte?                                                                  | 4              |
|    | b)            | Discuss about the characterization of shrimp immune system.                                                               | 3              |
|    | c)            | What are the immunosuppressive effects of pollutants and contaminants in aquaculture candidates?                          | 3              |
| 4. | a)            | Compare between immunosuppression and immunostimulation in fish.                                                          | 3              |
|    | <del>b)</del> | <del>What are the immunosuppressive effects of pollutants and contaminants in aquaculture candidates.</del>               | <del>3</del>   |
|    | <b>b</b>      | How can stress produce disease state in fish?                                                                             | <del>4</del> 7 |
| 5. | a)            | What is fish vaccination?                                                                                                 | 2              |
|    | b)            | Explain the steps for the development of an effective fish vaccine.                                                       | 4              |
|    | c)            | Briefly discuss about the current trend and future prospects of fish vaccination in Bangladesh aquaculture.               | 4              |

**Chattogram Veterinary and Animal Sciences University**  
**Faculty of Fisheries**  
**Department of Aquaculture**  
**MS in Aquaculture, Jul-Dec semester, Final Exam/2025**  
Course Code: AFT-502 (T), Course Title: Aquaculture Feed Technology  
**Full Marks: 40; Time: 2hours**

Answer **any four (04)** from the following. Figure in the right margins indicates full marks. Splits answers is not acceptable.

1. a. Define anti-nutritional factors. Write down the major anti-nutritional and contaminations in feed ingredients. 4
- b. Explain in details the conventional and non-conventional feedstuffs for feed formulation 3
- c. Differentiate conventional and non-conventional feedstuffs used for feed formulation. 3
2. a. Write down the different types of feed according to life stages of fishes. 4
- b. Write down the factors that affect the quality of feed. 3
- c. Write down the importance and challenges of diet evaluation of formulated feeds 3
3. a. Write down the role of feeding regime in aquaculture. 3
- b. Explain in details the types of feeding methods with their advantages and disadvantages. 4
- c. What do you mean by feeding rate and frequency. Write down the basic rules for feeding. 3
4. a. Explain in details the different feeding methods used in aquaculture with their advantages and disadvantages 4
- b. What are the factors affecting feeding strategies? 3
- c. Write down the challenges in feeding management 3
5. a. Explain in details the importance of quality control in fish feed manufacturing 3
- b. Summarize the different stages of quality control in fish feed manufacturing 3
- c. Write down the challenges and strategies to improve in quality control in fish feed manufacturing 4
6. a. Explain in details the different types of feed evaluation 4
- b. Write down the selection criteria of selecting ingredients for feed formulation 3
- c. Write down the key principles for formulation and preparation of fish feed 3

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**MS in Aquaculture, Jul-Dec semester, Final Exam/2025**  
Course Code: SAC-502 (T), Course Title: Sustainable Aquaculture and Climate Change  
**Full Marks: 40; Time: 2hours**

*Answer **any four (04)** from the following. Figure in the right margin indicates full marks. Splitted answers are not acceptable.*

1. a. What is the goal of IPCC? 2  
b. Discuss the impacts of IPCC working groups on Bangladesh's Climate Strategies. 4  
c. Enumerate the mechanism of stakeholder participation for sustainable aquaculture development. 4
2. a. Depict the role of one health approach in climate resilient aquaculture adoption. 5  
b. RAS and Biofloc are modern examples of sustainable resource utilization- justify this statement. 5
3. a. Delineate the sectoral effects of climate change and strategies for adapting to and mitigating it. 5  
b. How gender, equity and social inclusion can be affected by climate change? 5
4. a. Briefly describe the convention on biological diversity. 5  
b. What are the direct and indirect negative impacts of aquaculture production? 5
5. a. Develop a sustainable aquaculture framework for coastal aquaculture in Bangladesh. 5  
b. Write down the future projections of global impact of climate change. 5
6. a. Briefly describe climate-smart aquaculture and resilience in seafood production. 5  
b. What are the impacts of climate change and responses in aquatic food system in southwest coast of Bangladesh? 5

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**MS in Aquaculture, Jul-Dec semester, Final Exam/2025**  
Course Code: ACA-502 (T), Course Title: Advanced Coastal Aquaculture (Theory)  
**Full Marks: 40; Time: 2hours**

*Answer **any four (04)** from the following. Figure in the right margin indicates full marks.  
Splitted answers are not acceptable.*

- |    |    |                                                                                           |   |
|----|----|-------------------------------------------------------------------------------------------|---|
| 1. | a. | What do you know about softshell crab?                                                    | 2 |
|    | b. | Design a soft-shell crab farm.                                                            | 4 |
|    | c. | Depict the oyster hatchery and farm activities in coastal area.                           | 4 |
| 2. | a. | How would you culture shrimp in recirculatory aquaculture system?                         | 5 |
|    | b. | Enumerate the process of designing a brackish water fish hatchery.                        | 5 |
| 3. | a. | What do you know about the reproductive biology of Seabass?                               | 2 |
|    | b. | Briefly describe the hatchery operation of Seabass.                                       | 4 |
|    | c. | How would you implement GAP in coastal shrimp farms?                                      | 4 |
| 4. | a. | Enumerate the process of sea urchin breeding in hatchery and nursery in the wild.         | 6 |
|    | b. | How would you select a quality brood from the wild for the breeding of Blackspot Croaker? | 4 |
| 5. | a. | What are the way forward to attain mariculture sustainability in Bangladesh?              | 5 |
|    | b. | How coastal aquaculture can foster Blue economy in Bangladesh?                            | 5 |

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**MS in Aquaculture, Jul-Dec semester, Final Exam/2025**  
**Course Code: IAF-502 (T), Course Title: Integrated Aqua-farming**  
**Full Marks: 40; Time: 2hours**

Answer **any four (04)** from the following. Figure in the right margins indicates full marks. Splits answers is not acceptable.

1. a. Write down the prospects of integrated aquafarming in Bangladesh 2  
b. Discuss in details the socio- economic importance of integrated aquafarming 4  
c. To succeed, integrated aquafarming what are the key socio- economic factors need to be considered? 4
2. a. Write down the major potential linkages between livestock and fish production? 3  
b. Write down the benefits and future development of livestock-fish farming in Bangladesh. 3  
c. Explain in details the types of livestock cum aquaculture systems. 4
3. a. Based on the land characteristics and source of water there are two types of rice-fish culture systems – explain in details. 4  
b. Write down the benefits and disadvantages of rice-aquaculture farming. 3  
c. Write down the management system of rice-aquaculture farming. 3
4. a. Write down the different components for integrated multi-trophic aquaculture (IMTA). 3  
b. Explain in details the points need to be consider for designing an effective IMTA system. 3  
c. Summarize the advantages and disadvantages of integrated multi-trophic aquaculture (IMTA). 4
5. a. What are the factors need to be considered for a successful aquaponic system. 4  
b. Explain in details the different types of aquaponic system practice in aquaculture 3  
c. Write down the benefits and challenges of aquaponic system. 3
6. a. Write down the necessity of planning management in aquaculture. 2  
b. Explain in details the major types of planning systems in integrated aquafarming management. 4  
c. What are the areas need to be covered by long-term and yearly planning for an integrated aqua-farming system. 4