

Chattogram Veterinary and Animal Sciences University, Chattogram
Faculty of Fisheries

B. Sc. Fisheries (Hons.), Year-03, Semester-02 (July-December), Final Examination' 2022
Course No. 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 pharmacy, pharmacology, pharmacopoeia and potency. 4
b) What are the significances of studying fish pharmacology? 3
2. a) Write down the properties of an ideal drug. 2
b) Briefly discuss major types and sources of drugs. 5
3. a) What is antimicrobial resistance? 1
b) Write in brief about the antimicrobial resistance mechanism. 3
c) Discuss aquaculture as a source of antimicrobial resistance in human pathogens. 3
4. a) Define drug metabolism, absorption and excretion. 3
b) Briefly discuss the principles of drug absorption and excretion in fish. 4
5. a) What do you mean by dose and dosage? 2
b) Discuss the factors that affect drug effect and dosage. 5
6. a) Define withdrawal period. 2
b) Describe major groups of antibiotics with their sources and mechanism of actions. 5
7. Write short notes on **any 2 (two)** of the following: 3.5×2=7
a) Good aquaculture practices; b) Bioavailability of drugs and c) Abuse of drugs

Section B

8. a) Why selection of a drug administration route is important? 3
b) Illustrate dose-response relationships of aquadrugs. 4
9. a) Enumerate some disinfectants applicable to aquaculture and their methods of use. 2
b) Write in brief about disinfection following an outbreak of a disease in "all-in/all-out" management practices. 5
10. a) Define anesthesia. Name important anesthetic agent of fish. 3
b) Mention the stages of anesthesia in fish. 4
11. a) What is phage? 1
b) Classify phages with examples. 2
c) Write in brief about the application of phages in aquaculture and other purposes. 4
12. a) Name important commercial aqua-drugs used in Bangladesh aquaculture. 3
b) What are the problems associated with the indiscriminate use of drugs in aquaculture? 4
13. a) Enlist some breeding inducing drugs used in aquaculture. 2
b) Enumerate commercially available steroids to induce sex reversal in fish. 5
14. Write short notes on **any 2 (two)** of the following: 3.5×2=7
a) Drug laws; b) Receptor mediated drug action and c) Pharmacokinetics

Chattogram Veterinary and Animal Sciences University, Chattogram
Faculty of Fisheries

B. Sc. Fisheries (Hons.), Year-03, Semester-02 (July-December), Final Examination' 2022
Course No.: CCF-302(T), Course Title: Climate Change and Fisheries (Theory)
Total Marks: 70, Time: 3 hours

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

Section-A

1. a) Define global warming. 2
b) Mention some evidences of global climate change on earth. 2
c) Elaborate your understanding regarding human involvement in modern climate change. 3
2. a) What does ODS stands for? Mention some uses of its uses. 3
b) Write down a brief note on the "Success of Montreal Protocol" in eliminating the ODS. 4
3. a) "New challenges are emerging from current context of climate change on Fisheries governance" – explain this statement. 3
b) Elaborate your understanding regarding role of institution in adaptation process due to vulnerability of climate change. 4
4. a) What does SSFs stands for? Write down the importance of SSFs in Bangladesh. 2
b) How do such fisheries become vulnerable due to the exposure of negative climate? 3
c) How can you overcome such vulnerability? 2
5. a) Enlist the factors that control the 'vulnerability' of regions, groups and hot spots. 3
b) How can you suggest potential adaptive responses in meeting any climatic disorder in Asia with special emphasize in the context of Bangladesh? 4
6. (a) Differentiate between small-scale fisheries and large-scale fisheries. 2
(b) Review the impact of climate change variabilities on artisanal marine fisheries production. 2.5
(c) Identify the aquaculture's contribution and potential impacts of aquaculture activities on climate change. 2.5
7. Write short notes on any 02 (Two) of the following 3.5×2 =7
a) Carbon sequestration b) Climate change and primary production c) Climate diplomacy

Section-B

8. a) What does 'IPCC' stands for? Enlist its aims. 2
b) Describe the advancement pattern of Bangladesh in meeting the direct and relative impacts of climate change with example. 5
9. a) Discuss food-web impacts from plankton to fish due to climatic disorder. 3
b) Illustrate match-mismatch hypothesis of Cushing. 4
10. a) Differentiate between primary and secondary production. 2
b) Develop a comparison on the impacts of primary and secondary productivity due to climate change. 5
11. a) Why fresh water is more vulnerable to climate change? 2
b) How does ocean become stratified day by day? 2
12. a) *Discuss the impacts of heat content and temperature on oceanic ecosystems.* 3
b) How climate change is increasing the risk to aquaculture posed by diseases? 3
c) Discuss the challenges of predicting climate change impacts on culture fisheries. 4
13. (a) Infer the fisheries contribution to food safety, livelihoods and economic development of Bangladesh. 3
(b) Discuss the impacts of climate change events on shellfish aquaculture. 4
14. Write short notes on any 02 (Two) of the following 3.5×2 =7
a) Carbon cycle b) Climate vulnerability c) Global warming

21.12.23

Chattogram Veterinary and Animal Sciences University, Chattogram

Faculty of Fisheries

B. Sc. Fisheries (Hons.) Year -03, Semester-02 (July-December), Final Examination' 2022

Course No: MBE-302 (T), Course Title: Molecular Biology and Embryology (Theory)

Total Marks: 70

Time: 3 hours

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

Section-A

1. a) What do you know about molecules and Molecular Biology? 4
b) Establish a relationship between Molecular Biology with the other branches of biological sciences. 3
2. a) What do you understand by genetic code, codon and anticodon? 3
b) Compare and contrast between start and stop codon. 2
c) Discuss the central dogma of life. 2
3. a) Why DNA replication is an essential event in cell biology? 2
b) "DNA replication is semiconservative"- explain. 2
c) What do you know about replication fork and Okazaki fragment? 3
4. a) "Hormone is a chemical messenger"- justify the statement. 2
b) Outline the process for the synthesis and release of peptide hormones in fish. 5
5. a) "Translation is the process of decoding the mRNA"- explain. 2
b) How DNA is transcribed into RNA? Explain with diagram. 5
6. a) What do you understand by gene expression and gene regulation? 2
b) Why gene regulation is required in multicellular organisms? 2
c) Explain the term splicing, TATA box and silencer. 3
7. a) What do you understand by mutation, mutagen and mutagenesis? 3
b) What do you understand by frameshift mutation? Illustrate frameshift mutations incorporating both insertion and deletion of nucleotide(s). 4

Section-B

8. a) What do you understand by primordial germ cell, gamete and embryo? 2
b) Diagrammatically show the structure of male and female gamete of fish. 2
c) Briefly explain the urinogenital system in male Acipenser and Lepidosiren. 3
9. a) What do you know about the gametogenesis? 2
b) Illustrates and explain the process of sperm production in *Labeo rohita*. 5
10. a) "Fertilization is the initial stage of life"- explain. 2
b) Point out the post-fertilization changes in an egg. 2
c) Compare and contrast between slow block and fast block polyspermy. 3
11. a) Explain the following terms with diagram: blastodisc, cleavage, morula, blastula and gastrula. 3
b) List out the origin of varieties of cells, organs and systems from different germ layers. 4
12. a) What do you understand by organogenesis and metamorphosis? 2
b) Diagrammatically show the developmental modules in organogenesis. 2
c) "Development of a fish is an endless process"- justify the statement. 3
13. a) What do you understand by vitellogenesis? 1
b) Briefly explain the hormonal regulation of oocyte growth in fish. 4
c) Construct a flow diagram showing the hormonal regulation of acquirement of sperm motility. 2
14. Write short note on any two (02) of the following: 3.5 × 2 = 7
a) Operon, b) Translation, c) Seminiferous tubule, and d) Micropyle

Chattogram Veterinary and Animal Sciences University, Chattogram
Faculty of Fisheries
B. Sc. Fisheries (Hons.), Year-03, Semester-02 (July-December), Final Examination' 2022
Course No. 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) Why knowledge on aquaculture engineering is important for integrated aquafarm construction? 3
b) Describe different land-based aquaculture systems with diagram. 4
2. a) Write the criteria of the site selection for aquafarm planning. 3
b) Describe the cost-benefit analysis of the ideal aquafarm in Bangladesh. 4
3. a) What do you mean by contract, tender and bids in respect of aquafarm planning? 3
b) Discuss the major points to evaluate tender documents following the FAO guidelines for construction of the aquaculture farm. 4
4. a) Discuss the components of a marine fish hatchery setup. 4
b) Among Biofloc, Raceway and RAS, which one do you consider more preferable in our country? Why? 3
5. a) Why wastewater treatment in different culture system is important in Bangladesh? 2
b) Briefly describe the waste management system of re-circulatory aquaculture system. 5
6. a) What are the future inventions in aquaculture for the blue economic development in 3
Bangladesh? 3
b) Explain the key interventions in marine aquaculture. 4
7. Write short notes on **any 2 (two)** of the following: 3.5×2=7
a) Offshore aquaculture; b) Marine cage culture and c) Feed and Feeding in aquaculture

Section B

8. a) Briefly describe the essential components of fish hatchery. 4
b) A raceway has a physical dimension of 33 m length × 2 m width × and 1 m depth and contains 2500 kg fish; the flow rate in the raceway $Q = 2500 \text{ L/m}$; calculate the raceway parameters such as Rearing volume; Flow rate; Rearing density; Loading; Exchange rate or Turnover rate 3
9. a) Explain how does Biofloc technology boost the aquaculture production? 3
b) Briefly describe the solid management strategies of Biofloc aquaculture system. 4
10. a) What do you understand by 'Recirculating Aquaculture System'? 2
b) Illustrate and explain the construction process of a large-scale recirculating aquaculture system. 5
11. a) What are the importances of brood and nursery ponds in aquaculture? 3
b) Briefly describe the components of shrimp hatchery complex in coastal area. 4
12. a) Define 'fluid mechanics' and 'fluids in motion'. 2
b) Discuss the principles of aeration and their practices in shrimp aquaculture. 5
13. a) "Domestication is the first step of artificial breeding"-explain. 3
b) Between series and parallel raceway aquaculture system which one is more cost effective and Why? 2
c) Develop a raceway fish farm model for a commercial aquafarm. 2
14. Write short notes on **any 2 (two)** of the following: 3.5×2=7
a) Artificial breeding; b) Integrated multi-trophic aquaculture and c) Economic appraisal of aqua-farm

Chattogram Veterinary and Animal Sciences University, Chattogram
Faculty of Fisheries
B. Sc. Fisheries (Hons.), Year-03, Semester-02, Final Examination' 2022
Course No. 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 marks. Use separate answer script for each section.*

Section-A

1. a) Define agribusiness management. Explain basic functions of management. 3.0
b) Explain different elements of business and marketing. 4.0
c) Enumerate the challenges of agribusiness with special reference to fisheries sector. 4.0
2. a) Define planning along with its characteristics. 4.0
b) Explain in what ways effective planning supports agribusiness development in Bangladesh. 4.0
c) Point out and describe the areas where an agribusiness plan is different from a typical business plan. 4.0
3. a) What are the general functions of management? Narrate any two of them. 6.0
b) List the 14 principles of management proposed by Henry Fayol. Explain any four of them. 6.0
4. a) What do you mean by 'SMART' goal? 2.0
b) Write down the vision and mission of the Faculty of Fisheries at CVASU. 3.0
c) List and narrate the steps of Strategic Management Process. 7.0

Section-B

5. Suppose you are working as a marketing manager at a company in the processed fish industry. 11.0
Your company wants to launch a new product for the **elderly people** in Chattogram. Develop a hypothetical marketing plan for your company.
6. a) Explain the role of Total Quality Management in Agribusiness. 6.0
b) Consider any agro-product and illustrate its supply chain. 6.0
7. a) Define aqua entrepreneurship. What are the challenges of it? 7.0
b) List and narrate the four steps of entrepreneurial process. 5.0
8. a) Define Market Skimming Pricing and Market Penetration Pricing. 3.0
b) What do you mean by channel of distribution? Draw the distribution channel of Sea fish. 5.0
c) Define promotion. Why promotion is important for any business? 4.0

Chattogram Veterinary and Animal Sciences University, Chattogram
Faculty of Fisheries

B. Sc. Fisheries (Hons.), Year-03, Semester-02 (July-December), Final Examination' 2022
Course No. FPT-302(T), Course Title: Fishery Products Technology (Theory)
Total Marks: 70, Time: 3 hours

Answer any 05 (five) questions from each section. Use separate answer script for each section. Figures in the right margin indicate full mark.

Section-A

1. a) What are the primary components of "Fishery Products Technology," and how can you use your knowledge on this subject to enhance seafood-based product development? 4
b) Differentiate between fishery products, by-products, and co-products. 3
2. a) What is smoking? Do you think cold smoked fish can preserve for a long time? Explain. 3
b) Differentiate between hot and cold smoking. What kind of technological problems may arise during smoking of fish? 4
3. a) Write down the advantages and disadvantages of surimi-based products. 3
b) Enlist the suitable criteria of fish species for surimi production. 1
c) How can sustainable practices be integrated into surimi production to optimize efficiency while minimizing the environmental impact? 3
4. a) How does fish drying contribute to the preservation of fish, and what is the role of moisture removal in this process? 2
b) What factors influence the quality and safety of dried fish products, and how can these be controlled during the drying process? 3
c) Explain the advantages and disadvantages of traditional sun drying versus modern mechanical drying methods for fish. 2
5. a) Differentiate between wet-rendering and dry-rendering process in fish meal production. 3
b) Give a detailed flow-diagram on fish oil extraction from sardine. 4
6. a) What are the constraints of seaweed collection and processing in Bangladesh? 3
b) What is Algin? Briefly discuss the production procedure of Algin from brown seaweed. 4
7. a) Describe the key attributes that make a cold storage facility highly effective and reliable. 2
b) Illustrate different types of cold storage with their advantages and disadvantages. 5

Section-B

8. a) Write down the production procedure of canned products. 3
b) Discuss TDT curve, D value, F value and Z value in fish canning. 4
9. a) What challenges and opportunities exist in the large-scale cultivation of seaweed for commercial production in Bangladesh? 4
b) Write a short note on Agar production process. 3
10. a) Is there any difference between fish oil and krill oil? Please provide an explanation. 3
b) Briefly describe the production procedure of surimi from *Hypophthalmichthys molitrix*. 4
11. a) If you have a high lipid content in your raw material and final product, what precautions do you need to take from lipid extraction to final product development? 4
b) "Shelf life of frozen fish is longer than that of chilled fish"- justify. 3
12. a) What are the differences between fish mince and surimi? 2
b) "Surimi is an intermediate product"-justify the statement. 2
c) What is crab-leg analog? How can you prepare analog products from surimi? 3
13. a) What is fish protein hydrolysate (FPH)? Draw a flow diagram for production of FPH. 3
b) Discuss the production procedure of Fish Protein Concentrate (FPC). Differentiate between FPC and FPH. 4
14. Write down short notes any TWO of the following: 3.5 × 2=7
a) BFFEA; b) Fish pickles and fish soup powder; and c) Isinglass and ambergris

Chattogram Veterinary and Animal Sciences University, Chattogram
Faculty of Fisheries
B. Sc. Fisheries (Hons.) Year -03 Semester-02, Final Examination' 2022
Course No: MFM-302 (T); Course Title: Marine Fisheries Management (Theory)
Total Marks: 70, Time: 3 hours

*Answer any **05 (five)** questions from each section. Figures in the right margin indicate full marks. Use a separate answer script for each section.*

Section-A

1. a) Who are stakeholders in Marine Fisheries Management? Describe the management strategies that are commonly applied for marine fisheries management in Bangladesh. 5
 b) Mention the issues and challenges of implementing strategies for marine fisheries management in Bangladesh. 2
2. a) Compare and contrast between artisanal fishing and industrial fishing. 2
 b) Discuss the characteristics of major artisanal and industrial fishing gear used in the Bay of Bengal by mentioning their mesh size, target species, depth of operation and level of water column they operated. 5
3. a) What is fishery-dependent and fishery-independent data? How are these data collected? 2
 b) Briefly discuss the general provisions of issuing licenses for fishing in the Bay of Bengal according to the Marine Fisheries Act 2020. 3
 c) Why does marine fisheries management often sets size limits for harvested fish? 2
4. a) Enlist hilsa sanctuaries and associated ban periods applicable for Bangladesh. 3
 b) Mention the names of fishing gear contributing to ghost fishing according to their level of risk. 2
 c) What methods can you use to locate the derelict fishing gear? 2
5. a) Why declaring MPA is essential for marine fisheries management? 2
 b) Discuss the MPAs of Bangladesh by mentioning their area, acts under which they declared and main features from an ecological sensitivity and biodiversity point of view. 5
6. a) What do you understand by isometric growth? 2
 b) What are the formula used for calculating the value of the exponent 'n' and the constant 'c' in length-weight relationship? 5
7. Write short notes on any **02 (Two)** of the following 3.5×2= 7
 a) Hilsa Fisheries Management Action Plans; b) EBFM and c) Non-conventional Fisheries Resources.

Section-B

8. a) What is inshore and offshore fisheries? Why is Bangladesh still far behind in exploiting offshore fisheries resources from the international water? 4
 b) Discuss the major issues of ESNB in the coastal waters of Bangladesh. Formulate your recommendation for overcoming these issues. 3
9. a) Compare and contrast between the marine protected area and the ecologically sensitive area. 2
 b) Discuss on the major marine reserve areas of Bangladesh. 3
 c) Why do major fishing grounds of the world are found in temperate regions of the Northern Hemisphere? 2
10. a) What is the IUU fishing index? Briefly discuss various IUU fishing activities that exist in marine fisheries in the Bay of Bengal. 3
 b) Discuss the impact of IUU fishing in Bangladesh with the measures you can take to combat IUU fishing? 4
11. a) Define VPA. State the basic principle of VPA. 5
 b) Write down the steps necessary for VPA. 2
12. a) Why are catch-share programs used in marine fisheries management? 2
 b) Why inclusion of turtle-excluding devices is necessary in trawl nets? 2
 c) Briefly discuss the advantages and disadvantages of total allowable catch system for marine fisheries management. 3
13. a) Describe the code of conduct for responsible fisheries. 4
 b) Briefly discuss incentive-based hilsa fisheries management of Bangladesh 3
14. Write short notes on **any 02 (Two)** of the following: 3.5×2=7
 b) Aichi Biodiversity Target; b) Pelagic fisheries resources of Bangladesh and c) Gear selectivity.

Chattogram Veterinary and Animal Sciences University, Chattogram

Faculty of Fisheries

B. Sc. Fisheries (Hons.), Year-03, Semester-02 (July-December), Final Examination' 2022

Course No.: ABC-302(T), Course Title: Aquatic Biodiversity and Conservation (Theory)

Total Marks: 70, Time: 3 hours

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

Section-A

1. a) Define Biodiversity. 1
b) What are the links between biodiversity and ecosystem? 2
c) Write down the economic and ecological importance of aquatic biodiversity. 4
2. a) Write down the goals of IUCN red list. 1.5
b) Differentiate critically endangered and vulnerable fishes with examples. 2.5
c) How conservation is interlinked with biodiversity of a habitat? 3
3. a) Write four scientific names of small indigenous species available in Bangladesh. 2
b) What are the threats in the natural habitat of SIS? Elucidate some suggestions to overcome the problems. 5
4. a) How is In-situ conservation different from Ex-Situ conservation? 3
b) Describe different In-Situ ways of fisheries conservation. 4
5. a) What are the anthropogenic and natural factors those cause the loss of aquatic biodiversity? 3.5
b) Mention the ways out to protect and save the biodiversity from the threats. 3.5
6. a) What is trans-boundary protected areas? 1
b) Differentiate 'national park' and 'wildlife sanctuaries'. 3
c) What points should be considered before and after the establishment of a fish sanctuary. 3
7. a) ~~How conservation is interlinked with biodiversity of a habitat?~~ ^{How do the sanctuary help the wildlife?} 3
b) What is fisheries conservation? Write down its objectives. 2
c) Elicit the principal reasons of biodiversity loss. 2

Section-B

8. a) Define "indigenous", "exotic" and "invasive" fish with examples. 3
b) How serious is the threat to biodiversity posed by invasive alien species? 4
9. a) What is beel, haor and baor? 3
b) "Tanguar haor" is called an ecologically critical area"-explain. 4
10. a) Why it is necessary to estimate the Biodiversity? 1
b) Describe "Shannon-Wiener Index" as a method of biodiversity assessment. 3
c) What is the difference between "Simpson index" and "Shannon-Wiener Index"? 3
11. a) Enlist the ecological principles of aquatic conservation. 3
b) Write down the significance of "keystone species" in regulating an ecosystem. 4
12. a) What is Ramsar site? Name the Ramsar sites of Bangladesh. 2
b) Differentiate between "Near Threatened" and "Endangered" fish. 2
c) What necessary actions can you undertake for "Data deficient" species? 3
13. a) What is biodiversity index? Describe the factors affecting biodiversity index. 3
b) Discuss the criteria by which aquatic biodiversity is being assessed to prepare red-list. 4
14. a) What is ecosystem based management? 1
b) Which factors should you consider before doing ecosystem based management plan? 3
c) What is the benefit of ecosystem based management over other management tools? 3