

Chattogram Veterinary and Animal Sciences University, Chattogram

Faculty of Fisheries

B. Sc. Fisheries (Hons.) Year-3, Semester-1, Final Examination 2021

Course No: IFM-301 (T), Course Title: Inland 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) Define "Inland water bodies" and "Inland Fisheries Management." 2
b) Describe the multi-purpose use of inland water bodies. 5
2. a) Define fisheries regulation. 1
b) Write down the purposes and philosophy of fishery regulation. 2
c) Briefly describe the theories of fisheries regulation. 4
3. a) What do you mean by habitat restoration? 1
b) Classify freshwater habitat. 2
c) Write down different habitat improvement techniques of Lentic waterbodies. 4
4. a) What do you mean by fisheries cooperative? 2
b) What are the objectives of fisheries cooperative? 2
c) Write down the general principles of fisheries cooperative. 3
5. a) Write down the names of hilsa spawning grounds in Bangladesh. 2
b) Briefly discuss the hilsa fisheries management in Bangladesh. 5
6. a) Write about the major recreational fisheries resources of Bangladesh and their activities. 2
b) Explain different types of conflicts in recreational fisheries. 5
7. a) What is fish screen? 1
b) What are the purposes of fish screen? 2
c) Write down the challenges of managing inland fisheries. 4

Section B

8. a) What do you mean by life history data? 1
b) Why life history data is important for fisheries management? 3
c) Why fisheries management is so important? 3
9. a) Briefly discuss different types of fisheries regulation. 3
b) How the fisheries cooperative help in fisheries management? 4
10. a) What do you mean by fish pass? 1
b) Mention the basic requirements of a fish way. 2
c) Write down different habitat improvement techniques of Lotic waterbodies. 4
11. a) What do you mean by sustainability? 1
b) Explain the ecosystem approach for fisheries management. 3
c) Write down the principle of ecosystem approach to fisheries. 3
12. a) What are the key indicators to assess the achievement of sustainable livelihoods? 3
b) Briefly describe sustainable livelihood framework for managing fisheries. 4
13. Analyze SWOT to develop a cooperative society in the hilsa fishermen village. 7
14. Make a plan for the sustainable fisheries management in the Halda river, Bangladesh. 7

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B.Sc. Fisheries (Hons.) Year - 3 Semester - 1 (January-June), Final Examination, 2021
Course No: IOA 301 (T), Course Title: Integrated & Organic Aqua-farming (Theory)

Total Marks: 70; Time: 3 hours

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

Section-A

1. a. Summarize the present status and prospects of Integrated Aquaculture in Bangladesh. 4
b. What are the points need to be considered adopting integrated aqua-farming in Bangladesh? 3
2. a. Write down the advantages and disadvantages of Integrated Farming System (IFS). 5
b. Illustrate the factors for selecting IFS. 2
3. a. Write the criteria of the complex integrated system. 2
b. Describe the integrated system of rice-fish culture. 5
4. a. List out the constraints of duck-fish integration. 3
b. Write down the factors affecting the rice-fish integrated culture. 4
5. a. Write down the different waste producing in fish pond. 4
b. Write down the different types of aquaponics. 3
6. a. What do you mean by autotropic and heterotopic systems? 3
b. Illustrate the overview of energy budgeting process in integrated aquafarming systems. 4
7. Write short notes on **any 02 (two)** of the following: 3.5x2=7
i) Integrated Horticulture-Fish System; ii) Waste management in aquaculture and
iii) Fish husbandry.

Section B

8. a. Discuss the characteristics of organic farming. 2
b. 'Fish is an important component in integrated system'- discuss the statement? 5
9. a. What are the basic components of plant-fish integrated system? 2
b. Write down the advantage and disadvantages of organic aquaculture. 5
10. a. Write down the planning management for Integrated Aqua-farming 2
b. What are the areas need to be considered for a long-term and yearly planning of an Integrated Aqua-farming. 5
11. a. Explain the key interventions in biosecurity for integrated aqua-farming system 5
b. List out some recommendations for enhancing the adoption of organic aquaculture in Bangladesh. 2
12. a. Explain in details the integrated fish-livestock farming system. 4
b. Economic viability of Integrated Horticulture-Fish System. 3
13. a. Define Aquaponics. Write down the advantages and disadvantages of aquaponics. 3
b. What are the major factors need to be considered for a successful aquaponics system. 4
14. Write short notes on **any 02 (two)** of the following: 3.5x2=7
i) Integrated multi-trophic aquaculture (IMTA); ii) Waste-plant-fish integrated system and iii) Crustacean's culture in Rice Field.

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Faculty of Fisheries

B. Sc. Fisheries (Hons.) Year-3, Semester-1, Final Examination 2021

Course No: FPR 301 (T), Course Title: Fish Processing (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 fish processing. Write down the principles of fish preservation. 3
b) Vitamins and minerals play important roles as bio-factor in fish- Justify. 4
2. a) Define rigor-mortis. Describe the physical changes in fish during rigor-mortis. 4
b) Describe the biochemical changes of rigor-mortis in fish. 3
3. a) What is fish smoking? Differentiate between hot and cold smoking. 3
b) How does a wood smoke preserve fish? Explain. 4
4. a) Write the basic principles of canning. What are the aspects need to be considered for establishing a fish canning industry? 3
b) Describe briefly the canning process follows in the commercial canning industry. 4
5. a) Why "Thermal Arrest Period" is important in fish freezing? 3
b) Calculate the total energy required to freeze 30 kg shrimp of 25°C at -40°C by a spiral freezer. 4
6. a) Write down the principles of fish freezing. Schematically present the IQF method for fish freezing. 3
b) Discuss about the quality problem of frozen fish products. 4
7. a) What is modified atmosphere packaging? What are the aspects you should consider to select an ideal packaging material for fishery products? 3
b) Describe the fish freezing curve and 12D concept. 4

Section-B

8. a) Define fish fermentation. Discuss the principles of fish fermentation. 3
b) Briefly describe the *Shidhal* production process in Bangladesh. 4
9. a) Differentiate between drying and dehydration. Discuss the factors influence the rate of fish drying. 3
b) Discuss briefly the effects of drying on quality aspects of fish. 4
10. a) Describe the present status of drying in Bangladesh. 3
b) Enumerate the nature and extent of blowfly infestation during drying of Bombay duck. How do you control insect infestation in dried fish products? 4
11. a) Discuss briefly *Hilsa* salting practices in Bangladesh. 3
b) Describe the quality problems associated with fish salting. 4
12. a) Explain the terms: D-value, F-value, and Z-value. 3
b) Describe the chemical and microbial spoilages of canned products. 4
13. a) Define supercooling and crystallization. Which method is more efficient for fish freezing? 3
b) Explain the changes in organic phosphate in fish body during rigor mortis. 4
14. Write down short notes (any TWO) of the followings: 3.5 x 2 = 7
a) Glazing; b) Fish sauce; and c) Air blast freezer.

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B. Sc. Fisheries (Hons.) Year-3, Semester-1, Final Examination 2021

Course No: FGE-301 (T), Course Title: Fundamentals of Genetics (Theory)

Total Marks: 70 Time: 3 hours

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

Section-A

1. a) Define genetics and heredity. 2
b) Explain the significance of studying fish genetics. 2
c) Sketch and label a eukaryotic cell. 3
2. a) Write down the importance of cell division. 2
b) What is meiosis? Explain the meiosis-I cell division process of a eukaryotic cell with figures. 5
3. a) What is DNA packaging? Why is it important? 2
b) How is DNA packaged into a chromosome? 5
4. a) What is quantitative phenotype? Mention the characteristics of inheritance for quantitative phenotypes. 2
b) Explain the relationships among the components of phenotypic variance. 5
5. a) Differentiate among complete dominance, co-dominance and incomplete dominance. 2
b) Discuss the law of independent assortment with an appropriate example. 5
6. a) Define mutation. How do mutations occur? 2
b) Explain different types of gene mutation with figures. 5
7. Write down short notes on **any 02 (two)** of the following: 3.5×2 =7
a) Linkage; (b) Crossing over and (c) Epistatic interaction of genes

Section-B

8. a) What is cell and cell cycle? Which organelle has its own DNA? 2
b) Differentiate between karyokinesis and cytokinesis. 1
c) Write the functions of ribosome, endoplasmic reticulum, lysosome and mitochondria. 4
9. a) What is chromosome? Draw a diagram showing the structural components of a chromosome. 2
b) Explain the chemical compositions of a eukaryotic chromosome. 3
c) Illustrate the distinguishing features of DNA and RNA. 2
10. a) What is population genetics? Differentiate between genetic diversity and genetic variability. 2
b) State the Hardy-Weinberg principle and explain with example. 3
c) Explain the factors affecting gene and genotype frequency. 2
11. a) What is lethality? Mention two examples of lethal gene action in animals. 2
b) Explain lethal gene action with an example from fish. 5
12. a) What is sex determination and sex differentiation? 2
b) Discuss the two most common sex determination systems. 2
c) Describe Y-linked inheritance in fish. 3
13. a) What is multiple allelism? 1
b) Discuss multiple allelism with an appropriate example. 4
c) Why does an individual have only two alleles even if the character shows multiple allelism? 2
14. Write down short notes on **any 02 (two)** of the following: 3.5×2 =7
a) Penetrance and expressivity; b) Heritability and c) Sex-limited traits

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B. Sc. Fisheries (Hons.) Year-3, Semester-1, Final Examination 2021

Course No: APT 301 (T), Course Title: Aquatic Pollution and Toxicology (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 is pollution and contamination? 2.0
b) How ballast water and bilge water can produce problem in the marine environment? 2.0
c) Discuss the major sources of pollutants in the aquatic environment. 3.0
2. a) List down the major types of pesticides found in aquatic environment. 2.0
b) How DDT bio-accumulates and bio-magnifies in the marine environment? 3.0
c) What are the major challenges in managing pesticide-induced aquatic pollution in Bangladesh? 2.0
3. a) Why and how industrial pollution is becoming a serious threat to the inland and marine waters of Bangladesh? 3.0
b) Formulate an integrated management plan involving general people, industrial people, and government planners to control industrial pollution in Bangladesh. 4.0
4. a) What are the point and non-point sources of oil pollution in the marine environment? 2.0
b) Discuss the impacts of oil spills on aquatic organisms. 3.0
c) What common equipment can you use for clearing the oil spill from the marine water? 2.0
5. a) What is microplastic? How do microplastics enter in the food chain? 2.0
b) What are the impacts of microplastic pollution on aquatic organisms and human health? 2.0
c) Formulate your plan to control devastating plastic pollution in the aquatic habitats of Bangladesh. 3.0
6. a) What is eutrophication? How aquaculture may pose risks of pollution in aquatic habitats? 3.0
b) Prepare a plan to mitigate potential aquaculture-related pollution in the marine environment. 4.0
7. Write short notes on the following topics (Any two): 3.5×2= 7.0
a) Harmful algal blooms; b) Microbial pollution; c) Thermal Pollution d) Oxidation ditches

Section-B

8. a) What is grey water and black water? 2.0
b) Briefly discuss the physical, chemical, and biological properties of sewages. 2.0
c) Explain the key interventions in sewage treatment process for controlling aquatic pollution. 3.0
9. a) What is ecotoxicology? Enlists the name of common ecotoxicants in aquatic environment. 2.0
b) What toxicity tests can you use to detect and evaluate the ecotoxicants on aquatic organisms. 3.0
c) What is an indicator species? Mention the essential criteria of an indicator species for pollution monitoring? 2.0
10. a) Illustrate the mechanism of dead zone formation in the marine environment. 2.0
b) Is there any dead zone in the maritime area of Bangladesh? 1.0
c) Discuss the distribution, occurrence, and characteristics of major dead zones across the globe. 4.0
11. a) What is heavy metal pollution? How heavy metals specifically Hg biomagnifies in the marine food chain? 4.0
b) Formulate a bioremediation plan to control heavy metal pollution in the marine environment. 3.0
12. a) Enlists the major environmental policy guidelines related to aquatic pollution in Bangladesh. 2.0
b) Discuss the five key international principles to control environmental pollution. 5.0
13. a) What do you mean by radioactive pollution? 1.0
b) Discuss the various sources of radioactive pollution for the aquatic environment. 3.0
c) Discuss any two treatment methods for the removal of suspended solids and liquids from the wastewater. 3.0
14. Write short notes on the following topics (Any two): 3.5×2= 7.0
a) POPs b) Harmful algal blooms c) Metalloprotein d) Activated sludge

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B. Sc. Fisheries (Hons.) Year-3, Semester-1, Final Examination 2021

Course No: SFB-301 (T), Course Title: Shellfish Biology (Theory)

Total Marks: 70 Time: 3 hours

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

Section-A

1. a) Define shellfish. 1
b) Enlist eight commercially important shellfishes in Bangladesh with their common and scientific names. 4
c) Mention the prospects of commercial shellfish culture development in Bangladesh. 2
2. a) Write down the identifying features of crustaceans and molluskan shellfish. 3
b) Draw a typical mollusk and identify its basic body plan. 2
c) Does all mollusk have the same circulatory system? - Justify your answer. 2
3. a) What is thelycum and brood chamber? 2
b) Differentiate between a male and female crab. 2
c) Sketch and describe the life cycle of *Scylla serrata*. 3
4. a) Differentiate a freshwater giant prawn from a marine tiger shrimp. 2
b) Describe briefly the life cycle of marine tiger shrimp. 5
5. a) What is meant by Cephalopod? 1
b) Write down the economic importance of Cephalopod. 2
c) Briefly describe the reproduction of *Octopus*. 4
6. a) Name four bivalves available in the Cox's Bazar coast. 2
b) Point out the morphological features of oyster. 2
c) Mention the age-size, lifespan and reproduction of *Crassostrea virginica*. 3
7. Write down short notes on any two (02) of the following: 3.5×2=7
a) Clam; (b) Environmental effects on shellfish aquaculture and (c) Pearl formation

Section-B

8. a) Do you agree shellfish is fish? Explain your answer. 1
b) Briefly describe the economic importance of shellfish in Bangladesh. 3
c) Find out the declining factors of shellfishes. 3
9. a) Draw and label the internal anatomy of a bivalve. 2
b) Explain the feeding mechanism of a ~~bivalve~~ univalve. *Handwritten: univalve, 5-6-22* 1
c) "Bivalves worked as indicators of environmental variation and potential anthropogenic impacts"- Justify. 4
10. a) What do you mean by broadcast spawning and spat settlement? 2
b) Outline the environmental cues for shellfish reproduction. 3
c) What types of habitats do shellfish prefer? 2
11. a) Outline the morphological features of a Mussel. 2
b) Summarize the reproductive behavior and the life cycle of *Perna viridis*. 5
12. a) What is molting behavior? 2
b) What do you mean by reflex amputation? 1
c) Enumerate the reproduction mechanism of a Lobster. 4
13. a) Write down the common name and taxonomic classification of *Pila* sp. 2
b) What are the mechanisms of bivalve feeding? 3
c) Write down the economic importance of *Pila* sp. 2
14. a) Generalize your ideas about squid breeding and reproduction. 5
b) "Octopuses die after reproduction"- find out the truth behind this event. 2

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B. Sc. Fisheries (Hons.) Year-3, Semester-1, Final Examination 2021

Course No: RSO-301 (T), Course Title: Rural Sociology (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 sociology and society? 3
b) Describe the importance of sociology in fisheries profession. 4
2. a) What is urbanization? Why do the rural people migrate to the urban areas? Explain. 4
b) "Push factor is more important than pull factor migration." Explain. 3
3. a) What are the main social institutions in Bangladesh? 3
b) Illustrate the characteristics of social institution. 4
4. a) Define culture? What are the elements of culture? 4
b) Explain various characteristics of culture in Bangladesh. 3
5. a) Briefly discuss the steps for conducting a social research. 4
b) Explain the types of sociological methodology. 3
6. a) What is agro-fishery? 1
b) Critically discuss the role of microcredit in the rural development of Bangladesh. 6
7. Write short notes on the following: 3.5x 2=7
a) Human development (b) Socialization

Section-B

8. a) Mention some common social problems in Bangladesh. 3
b) Explain different kinds of psychological needs. 4
9. a) Write the types of social control. 3
b) What is public opinion? How do various agencies play role in raising public opinion? 4
10. a) Enumerate the various factors that cause the social change. 3
b) Explain briefly the sustainable livelihood approach. 4
11. a) What are the differences between patriarchy and patrilineal society? 3
b) What role an woman plays in the fisherman community? Explain. 4
12. a) Define integrated farming system. 2
b) Write down the causes of gender discrimination in the fisheries sector from the socio-economic perspective of Bangladesh. 5
13. a) Distinguish between- i) Gender and sex ii) Extended family and nuclear family. 4
b) Illustrate the social and economic differences between rural and urban societies. 3
14. Write short notes on the following: 3.5x 2=7
a) Personality b) Optimum research use

Chattogram Veterinary and Animal Sciences University, Chattogram
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B.Sc. Fisheries (Hons.) Year - 3 Semester - 1 (January-June), Final Examination, 2021

Course No: FPL 301 (T), Course Title: Fish Pathology (Theory)

Total Marks: 70; Time: 3 hours

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

Section-A

1. a. Define disease, infection and intoxication. 2
b. Briefly narrate the degrees of infection. 2
c. Why studying 'Fish Pathology' is important in aquaculture? 3
2. a. Define virulence and pathogenicity. 1
b. What is a bacterium? Draw and label the different parts of a typical bacterial cell. 3
c. What are the etiologies and clinical signs of "Edwardsiellosis" and "Columnaris"? 3
3. a. Define systemic infection and syndrome. 2
b. Describe "MAS" with its etiology, epizootiology, clinical signs, pathology and distribution. 5
4. a. Define stress and categorize the stressors of aquaculture. 2
b. Discuss about the transformation of stress into diseases in fish. 5
5. a. What is mycosis? 1
b. Describe mycoses of crayfish and lobster with etiologies, gross signs, diagnosis and control measures. 6
6. a. Define SPF and SPR. Illustrate the steps of shrimp SPF stock development. 3
b. Briefly discuss about luminous bacterial disease in shrimp culture. 4
7. Write short notes on **any 02 (two)** of the following: 3.5x2=7
i) WSS of shrimp; ii) Auto-immune disease and iii) Leukocytosis

Section B

8. a. Write down the importance of shellfish diseases. 2
b. Illustrate the diseases producing factors in shrimp. 2
c. List down the indication of shellfish health and diseases. 3
9. a. Write down the fate of viral infection in cell. 2
b. Illustrate the changes of cells in virus Infection. 2
c. Write down the effects of virus infection in the fish host 3
10. a. "There are several cells in the epidermis"- write down their name, characteristics and function. 5
b. Write down the function of gill, kidney and liver. 2
11. a. Write down the clinical observation of Furunculosis disease in fish. 3
b. Describe Saprolegniasis with its clinical signs, pathology and diagnosis. 4
12. a. Explain the essential amino acid (EAA) deficiency signs in fish. 3
b. Write down the gross anatomical deficiency signs of juvenile fish lacking EFAdiets. 4
13. a. Write down the different types of tumor. What are the factors responsible for development of a tumor? 3
b. Compare the primary differences between benign and malignant tumors. 4
14. Write short notes on **any 02 (two)** of the following: 3.5x2=7
i) Filamentous Bacterial Disease; ii) Gaffkemia and iii) Rickettsial infection of penaeid shrimp