

Chittagong Veterinary and Animal Sciences University, Chittagong
Faculty of Fisheries
B. Sc. Fisheries (Hons.) Year -02 Semester-02, Final Examination' 2017
Course No: CZM-202 (T), Course Title: Coastal Zone 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

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|----|----|--|---|
| 1. | a) | Mention the functions of Integrated Coastal Zone Management? | 2 |
| | b) | Show the map of landward and seaward boundaries of coastal zone in Bangladesh. | 3 |
| | c) | Differentiate between the southeast and southwest coastal activities of Bangladesh. | 2 |
| 2. | a) | Discuss the importance of zoning for sustainable coastal resource management in Bangladesh. | 5 |
| | b) | “Community participation is essential for coastal resource management”-Justify. | 2 |
| 3. | a) | Differentiate between policy and plan with suitable example. | 2 |
| | b) | Discuss the general steps in the formulation of a coastal management plan. | 5 |
| 4. | a) | Mention the environment-friendly coastal protection option in Bangladesh. | 2 |
| | b) | Mention the features of the mangrove co-management spectrum with figure. | 3 |
| | c) | Discuss the goods and services of mangrove ecosystem. | 2 |
| 5. | a) | Identify the major stakeholders for coastal tourism development. | 2 |
| | b) | Discuss the relationship among identified stakeholders with flow diagram. | 3 |
| | c) | Prepare the land use zoning of Cox's Bazar coast. | 2 |
| 6. | a) | “Mangrove functions as coastal bio-shield to protect the coastal ecosystem”-Explain the statement. | 2 |
| | b) | Discuss about the impacts of shrimp farming on the mangrove biodiversity of coastal zone. | 3 |
| | c) | List down your suggestion to protect the mangrove biodiversity of coastal zone. | 2 |
| 7. | a) | What do you mean by resource use conflict? | 2 |
| | b) | Analyze the resource use conflict using problem tree technique. | 3 |
| | c) | Define horizontal and vertical integration for coastal resource management. | 2 |

Section-B

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|-----|---|---|-------|
| 8. | a) | What do you mean by coastal zone management? | 1 |
| | b) | Briefly discuss the major functions and significances of CZM. | 3 |
| | c) | Sketch the coastal morphology with brief discussion. | 3 |
| 9. | a) | What are the importance of shore protection works. | 1 |
| | b) | “Goods and services of mangroves create an ecologically sustainable shore management” justify the statement. | 3 |
| | c) | How can you save different Islands from land erosion processes by environment friendly and cost effective shore protection options? | 3 |
| 10. | a) | What are the multiple uses of coastal resources in Bangladesh. | 2 |
| | b) | The ICZM process consists of three main components. Describes these three main components as the key to coastal zone development in Bangladesh. | 5 |
| 11. | a) | What do you know about the terms poverty and resilience? | 1 |
| | b) | What are the criteria for sustainable development of a healthy coastal ecosystem? | 3 |
| | c) | “World's poor are crowded in the coastal area” -discuss the statement. | 3 |
| 12. | a) | What are the major issues and challenges in coastal zone management of Bangladesh? | 3 |
| | b) | Develop an ICZM framework in context of Bangladesh for coastal resource management. | 4 |
| 13. | a) | What do you mean by community based management? Why do we need participatory community based management of our coastal resources? | 3 |
| | b) | Discuss about different salt production techniques used in the coastal areas of Bangladesh. | 4 |
| 14. | Write short notes on any two of the followings | | 3.5×2 |
| | a) | Sustainable livelihood management | |
| | b) | Marine protected areas | |
| | c) | Archipelagic concept | |

Chittagong Veterinary and Animal Sciences University, Chittagong
Faculty of Fisheries

B.Sc. Fisheries (Hons.), Year-2, Semester-2 (July – December), Final Examination' 2017

Course Code: FPA-202 (T); Course Title: Fish Parasitology (Theory)

Full Marks: 70; Time: 3 hours

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

Section -A

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|----|--|-----------|
| 1. | a) Define Prevalence, Mean intensity and Abundance. | 3 |
| | b) Discuss the influence of environment and aquaculture on parasite fauna of fish. | 4 |
| 2. | a) What do you mean by symbiosis and parasymbiosis? | 2 |
| | b) Write in brief different types of symbiosis in nature? | 5 |
| 3. | a) Differentiate between infection and infestation. | 1 |
| | b) Discuss dactylogyrosis with causative agent, sign and control measures. | 4 |
| | c) What do you mean by biological stressors? | 2 |
| 4. | a) What are endoparasites? | 1 |
| | b) Describe three fish endoparasites with their characters and examples. | 6 |
| 5. | a) Briefly describe various types of immunity. | 3 |
| | b) Narrate four cell and tissue reactions of fish against parasitic invasion. | 4 |
| 6. | a) Define fish borne zoonosis. | 2 |
| | b) Describe Cestodiasis as zoonotic disease. | 5 |
| 7. | Write short notes on any two of the followings- | 3.5 × 2=7 |
| | a) Caryophyllosis; b) Spiny headed worm; c) Origin of ectoparasitism. | |

Section B

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|-----|---|---------|
| 8. | a) What do you mean by biological control of fish parasitic disease? | 2 |
| | b) Describe life cycle of a digenetic trematode with figure. | 5 |
| 9. | a) Define stress and mention the stages of stress. | 2 |
| | b) Describe the physiological factors of fish parasitic diseases. | 5 |
| 10. | a) Distinguish between and protelean parasitism and imaginal parasitism. | 2 |
| | b) Describe a disease caused by imaginal parasite with its etiology, symptoms and control measures. | 5 |
| 11. | a) Write down the public health problems associated with fish consumption. | 2 |
| | b) Aquatic vectors are responsible for public health hazards-explain the statement. | 3 |
| | c) How do you control aquatic vectors? | 2 |
| 12. | a) Name some acanthocephalan and crustacean parasites. | 2 |
| | b) Illustrate the life cycle of a cestode. | 5 |
| 13. | a) What do you mean by facultative parasitism and pseudoparasitism? | 3 |
| | b) What are the basic treatment strategies of fish parasitic diseases? | 4 |
| 14. | Write short notess on any two of the followings. | 3.5×2=7 |
| | a) Flukes; b) Permanent parasitism; c) Mechanism of infection into disease. | |

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

Section -A

1. a) Define Microbiology and Fisheries Microbiology. Write down the importance of Microbiology in Fisheries sector. 4
b) Give a brief history of Microbiology. 3
2. a) "Microbes are everywhere"- explain. 2
b) What do you know about coliform bacteria? Why they are called "Sanitary index organisms"? 2
c) List down the similarities and dissimilarities between prokaryotes and eukaryotes. 3
3. a) Draw and label a typical bacterium. Classify bacteria on the basis of their shape with necessary figures. 3
b) What are the functions of bacterial capsule? Why cell wall of bacteria draws special attention? 2
c) Classify bacteria on the basis of arrangements of flagella on the bacterial cell wall with examples and necessary figures. 2
4. a) Describe one non-septate economically important mold used especially in food industry. 3
b) Write down the cultural and physiological characteristics of yeast. 4
5. a) Draw and label a bacterial endospore section. Why bacterial spore is called cryptobiotic? 2
b) Why endospore is more resistant to adverse environmental factors than vegetative cell? 1
c) Describe the stages of endospore formation in bacterial cell with labeled diagram. 4
6. a) What are the differences between pilus and flagellum of a bacterial cell? 2
b) Why bacterial spores are called endospore? Illustrate different arrangement of spores in bacterial cells with example. 2
c) Describe any two fish spoilage bacteria found in the temperate region. 3
7. a) Draw and label a typical viral particle. 1
b) Why viruses are called obligate intracellular parasites? Write down the characteristics of virus. 3
c) Classify virus according to Baltimore with examples. 3

Section B

8. a) Describe the lytic and lysogenic cycle of bacteriophage with labeled diagram. 5
b) Enlist some important DNA and RNA viral pathogens of fish. 2
9. a) Write down the general characteristics of aquatic bacteria. 2
b) Give the three views of the classification of living things. 2
c) Mention the major microbiological areas in the field of Microbiology. 3
10. a) Enlist some fish spoilage bacterial genera from cold and tropical water. 2
b) "Fish is an ideal substrate for microbial growth"-explain. 5
11. a) What do you mean by putrefaction? 1
b) Write down the mechanisms of bacterial spoilage in fish. 2
c) Discuss the action of microorganisms on carbohydrates, proteins, lipid and amino acids during post-mortem stages of fish. 4
12. a) "Microbial growth is autocatalytic"-explain. 1
b) Discuss how pH, a_w and E_h affect microbial growth. 6
13. a) Distinguish between microbial intoxication and microbial infection. 2
b) What is scombroid fish poisoning? How does it take place? How do you prevent it? 2
c) Describe briefly puffer fish poisoning. 3
14. a) Name at least 5 microbial intoxications with their causative agents associated with fish and shellfish. 1
b) Why botulin is called a neurotoxin? What are the characteristics of the causative agent of botulism? 2
c) Describe a bacterial food infection occurs in human being due to consumption of contaminated fish and fish products. 4

Chittagong Veterinary and Animal Sciences University, Chittagong

Faculty of Fisheries

B.Sc. Fisheries (Hons.), Year-01, Semester-2 (July – December), Final Examination' 2017

Course Code: FPD -202 (T); Course Title: Fish Population Dynamics (Theory)

Full Marks: 70; Time: 3 hours

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

Section -A

1. a) Distinguish between fish population and fish stock. 3
b) How do Fisheries Biologists contribute to fisheries science? Illustrate that a fish population is a simple biological system. 4
2. a) How do you estimate an area that is swept by a towed trawl net? What does the value of vulnerability depend on? 3
b) A research vessel completed catch at 5 stations having 10 km² area each on a unit stock distributed over an area of 360 km². The catch of those stations were 58, 64, 61, 67, and 56 kg. Calculate the mean catch with 95% confidence level. Use $t = 2.78$. 4
3. a) Why do the seasonal variations in condition of a fish for a given length occur? 3
b) Show algebraically how you linearize logistic equation. 4
4. a) What are the common types of spacing? Which one is the most advantageous and why? 2
b) A research vessel completes a trawl at 41 stations on a unit stock of 360 km² area with a trawl net of 20 m effective width and was towed a velocity of 8 km/h for 20 minutes at each station. The mean catch per trawl 64 kg and the standard of the mean was 18. Assuming that the vulnerability of the fish to the trawl net is 50% ($v=0.5$). Use the swept area method to estimate the total stock size with 95% confidence limit. Use $t = 2.09$. 5
5. a) Define L_{∞} . 2
b) Why is it important to estimate the growth of fish? 1
c) How to estimate growth parameters from von-Bertalanffy growth model? 4
6. a) Why is Petersen method biased in estimating absolute abundance? 3
b) Mention the advantage of measuring length over weight of marine species. Why is weight measurement required for fisheries work? 4
7. a) What are the factors that reduce the chance of survival of individuals in a fish population? 2
b) Describe the equations for catch curves to estimate mortality rate of a fish population. 5

Section B

8. a) What is catchability coefficient? Why are measures of CPUE the poor indices of stock abundance? 2
b) The number of sea cucumbers of six quadrats sampled from a habitat of 15,600 m² area are 7,14,9,9,15 and 6. All the quadrats are of equal size of 100 m². Calculate the absolute abundance of the population with 95% confidence level. Use $t = 2.45$. 5
9. a) What are the difficulties of using a single sample method for estimating the parameters of the von-Bertalanffy growth curve? 2
b) How are the tags used to record fish? 2
c) What is condition factor? Why is it studied? 3
10. a) What is GSI? How do you calculate GSI for both chordate fish and bivalves? 2
b) Discuss the definitions of recruitment. Why does recruitment vary from year to year? 2
c) Discuss stock recruitment relationship with Shepherd model. 3
11. a) Define 'back-calculation' of fish length? Describe the Lea's formula using for 'back-calculation'. 3
b) Analyse the mean lengths at age data of a certain fish stock given in the following Table to estimate the growth parameters K and L_{∞} . 4

Age (year)	I	II	III	IV	V	VI
Length (cm)	10.3	25.7	36.0	40.9	43.7	44.0

12. a) 'Poor relationship exists between spawning stock and recruitment strength' - Justify. 3
b) Estimate the constants of 'Beverton & Holt' and 'Ricker' models algebraically. 4
13. a) Mention the rate of fishing mortality in an unexploited stock. Write down the Pauly's equation to predict natural mortality. 3
b) A cohort of 100 individuals belong to a fish stock suffers a constant mortality of 20 per cent per year. Calculate the per cent survival of that cohort at the end of 3 years. 4
14. a) Name four hard parts of fish. 1
b) Write down the Pauly's equation to predict natural mortality. 1
c) How do you manipulate von Bertalanffy equation to von Bertalanffy plots? 3
d) Define L_c and L_m . 2

Chittagong Veterinary and Animal Sciences University, Chittagong

Faculty of Fisheries

B.Sc. Fisheries (Hons.), Year-2, Semester-02 (July – December), Final Examination' 2017

Course Code: FEC -202 (T); Course Title: Fisheries Economics (Theory)

Full Marks: 70; Time: 3 hours

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

Section –A

1. a) Define fisheries, fisheries economics and aquaculture. 3
b) Discuss the importance of fisheries economics in context of Bangladesh. 4
2. a) Define goods and utilities. 3
b) Discuss the law of diminishing marginal utility with its limitations. 4
3. a) Define indifference curve. 2
b) Diagrammatically explain how consumer reaches in equilibrium. 5
4. a) Define Bank. Discuss the functions of the Central Bank. 4
b) Discuss the role of micro-credit for rural financing. 3
5. a) Discuss the contribution of open water fisheries in Bangladesh. 4
b) Distinguish between subsistence and commercial fisheries. 3
6. a) Define division of labour. 3
b) Briefly discuss the criticism of the Malthusian theory of population. 4

Section B

7. a) Define TP, MP and AP 3
b) Mention and justify which production stage is preferred by a rational producer. 4
8. a) Define Planning. Discuss the basic steps of farm planning. 4
b) What is enterprise costing? Discuss the different costs and revenues of farm enterprise. 3
9. a) Define Agricultural Credit. 3
b) What are the sources of agricultural credit in Bangladesh? 4
10. a) What is the Production and Production function? 3
b) Explain the equilibrium of a firm with the help of TR and TC curve. 4
11. a) Define gross margin and farm profitability. 3
b) Why do demand curve slope downward to the right? 4
12. Write short notes on the following:
a) Efficiency of labour 3.5
b) Culture fisheries 3.5

Chittagong Veterinary and Animal Sciences University, Chittagong
Faculty of Fisheries
B. Sc. Fisheries (Hons.) Year -02 Semester-02, Final Examination' 2017
Course No: FOC-202 (T), Course Title: Fisheries Oceanography (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 topography and bathymetry. How is a shore different from a coast? 2.0
b) Briefly explain bathymetric features of Bay of Bengal. 3.0
c) What do you know about compensation depth and critical depth of marine environment? 2.0
2. a) What is constancy of composition in sea water? Where does this constancy become invalid? 2.0
b) Describe various processes that regulate the major constituents in seawater. 3.0
c) What is meant by "residence time?" Does seawater itself have a residence time? 2.0
3. a) Define sedimentation. What are the factors influencing transportation and distribution of sediments. 3.0
b) Marine sediments are usually combinations of terrigenous and biogenous deposits. Justify the statement. 2.0
c) Can marine sediments tell us about the history of the ocean from the time of its origin? Why? 2.0
4. a) What do you mean by geostrophic gyres? Write down the name of the geostrophic gyres with their location. 2.5
b) Why Antarctic circumpolar current is not considering as geostrophic gyre? 1.5
c) "Upwelling and downwelling are the life stimulating mechanism in the ocean"- Describe how? 3.0
5. a) Tides are the longest of all ocean waves. Justify how? 2.0
b) Sketch a typical wave and marks important features. 2.0
c) What do you mean by tidal datum? Tidal pattern can affect marine organisms. Describe how? 3.0
6. a) What do you mean by fishing ground? How to detect new fishing ground by using GIS technology? 3.0
b) Describe how can you utilize your oceanographic knowledge in identifying and locating unexplored fisheries resources of Bay of Bengal. 4.0
7. Write short notes on any two of the following: 3.5×2
a) Straddling and migratory fish species b) Coastal upwelling c) El Niño and La Niña

Section-B

8. a) What is turbidity current? What are the impacts of turbidity current on ocean bottom topography? 2.0
b) Describe briefly various key features observed in most beaches of marine environment . 3.0
c) "We have only one ocean with many features"-What does it mean? 2.0
9. a) What are some of seawater's colligative properties? Does pure water have colligative properties? 2.0
b) Technically, there are no "salts" in seawater. How can that be? 2.0
c) What is blue economy? What is the potential development strategy for ocean resources exploration in Bangladesh for blue economic development? 3.0
10. a) What is calcium carbonate compensation depth? How does it affect ooze deposition at great depths? 2.0
b) Hydrogenous sediments form directly from seawater. Explain the statement. 2.0
c) Briefly describe the classification of marine sediments by source of particles including their distribution and relative contribution to the area covered to ocean floor. 3.0
11. a) Why surface currents flow are evident around the periphery of ocean basin? 1.0
b) Write down the mechanism of eddy formation in the western boundary of Gulf Stream 3.0
c) Write down the name of eastern and western boundary currents with their location. Compare and contrast between these two boundary currents. 3.0
12. a) What do you mean by constructive wave and destructive wave? 2.0
b) Diagrammatically classify progressive wave depending on their wavelength relative to the depth of water through which they are passing. 3.0
c) Many factors influence wind wave development in the oceanic environment. Explain the statement. 2.0
13. a) What information are required for improving fishing tactics and fishery forecasting? 3.0
b) Describe the commercially important fishing grounds in Bangladesh? 4.0
14. Write short notes on **any two** of the followings: 3.5×2
a) Ekman transport b) Hydrothermal vent c) Challenger expedition

Chittagong Veterinary and Animal Sciences University, Chittagong

Faculty of Fisheries

B. Sc Fisheries (Hons.), Year -02, Semester-02 (July-December), Final Examination, 2017

Course Code: FPH 102 (T); Course Title: Fish Physiology (Theory)

Full Marks: 70, Time: 3 hours

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

Section-A

1. a. Define fish physiology. 1
b. Write the importance of studying fish physiology in context of aquaculture. 2
c. Fish is a poikilothermic animal- explains why. 2
d. Diagrammatically show the interrelationship between respiratory, circulatory and digestive system. 2
2. a. Define poikilothermy and homeothermy. 2
b. Distinguish between vasoconstriction and vasodilation. 2
c. How do poikilotherms regulate their body temperature? 3
3. a. Define digestion and digestive system. 1
b. Describe the protein digestion process in fish 5
c. How does HCL play role in digestion? 1
4. a. Make a comparison between external and internal respiration with examples. 2
b. Describe how countercurrent flow allows maximal O₂/CO₂ exchange in fish. 3
c. How does high temperature create respiratory problems in fish? 2
5. a. Write down the components of fish RBC and WBC. 4
b. Write down the name of organs that take part in the formation of blood cells in fish and amphibians. 3
6. a. Distinguish between kidney of freshwater and marine teleosts. 3
b. Briefly explain the osmoregulatory mechanisms of a freshwater fish. 4
7. a. What do you mean by vitellogenesis? 1
b. Explain endocrine control of vitellogenesis in fish. 4
c. Diagrammatically show the relationship among environmental factors, receptors, endocrine organs, and reproductive activity. 2

Section-B

8. a. What do you mean by catabolism and anabolism? 1
b. Describe the metabolic activity in fish. 3
c. What are the physical factors controlling metabolism in fishes? 3
9. a. Differentiate between digestion and metabolism. 1
b. Describe the absorption mechanism of digested food materials. 4
c. Make a comparison between active and passive transport. 2
10. a. What do you know about Bohr effect? 2
b. How do O₂ and CO₂ get carried to and from the cells or tissues in fish? 5
11. a. What do you know about chloride cell? 2
b. Write down the functions of a fish kidney. 2
c. What do you know about Fick's law of diffusion? 3
12. a. Distinguish between spermatogenesis and oogenesis. 2
b. What are the changes occur during growth phase of oogenesis? 3
c. What are the mechanisms of acrosome formation? 2
13. a. Classify animals on the type of major N-end products they excrete. 2
b. Explain the different types of fish kidney on the basis of structure. 4
c. Write the forms of nitrogenous waste that produced in different animals. 1
14. Write notes on any **Two (02)** of the followings: 3.5×2=7
 - a) Endothermy in fishes
 - b) HPG-axis
 - c) Negative feedback
 - d) Chemical messenger

Chittagong Veterinary and Animal Sciences University, Chittagong
Faculty of Fisheries

B. Sc. Fisheries (Hons.) Year -2 Semester-2, Final Examination' 2018

Course No: **FPH-202 (T)**, Course Title: **Fish Physiology (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 physiology. 1
b) How will you apply your fish physiological knowledge in aquaculture? 3
c) Justify fish as a poikilothermic animal. 3
2. a) "Digestion is a physiological process"-explain the statement. 2
b) Explain the role of an acid and an alkaline solution in food digestion. 2
c) Define the following terms- proteolytic enzyme, zymogen and emulsification. 3
3. a) Write the biological definition of respiration. 1
b) How does countercurrent exchange work in teleost? 4
c) How does high temperature create respiratory problems in fish? 2
4. a) Define fish blood. 1
b) Write the components and functions of leucocytes. 3
c) Write the name of the organs taking part in the formation of blood cells in fish and amphibians. 3
5. a) Define excretion. 1
b) Distinguish between kidney of freshwater and marine teleosts. 3
c) Diagrammatically show the structural unit of a mesonephric kidney. 3
6. a) Classify fishes on the basis of their reproductive behaviour. 2
b) Summarize the breeding behaviour of Three Spine Stickleback. 5
7. a) Write the forms of nitrogenous wastes occur in different animals. 3
b) Explain the osmoregulatory mechanisms of a marine fish. 4

Section B

8. a) Define metabolism. 1
b) Write different types of metabolic activities found in fish. 3
c) Diagrammatically show the metabolic pathways that involved in cellular respiration. 2
d) Write the name of the environmental factors that affect metabolism in fish. 1
9. a) Point out the components of the circulatory system and how will you relate among them. 3
b) Draw and label a fish heart and indicates the flow of blood through the heart. 1
c) Between 3 chambered and 4 chambered heart, which one is more efficient and why? 3
10. a) Distinguish between homeotherm and poikilotherm animals. 2
b) Explain how dohomeotherms maintain a constant body temperature? 4
c) In which situation vasoconstriction mechanism is followed? 1
11. a) What do you mean by spermiogenesis? 1
b) Illustrate the spermatogenesis process in fish. 4
c) Draw and label a mature spermatozoon of a teleost. 2
12. a) Define endocrine gland. 1
b) Is hormone a chemical messenger? Explain. 3
c) Write the name and function of hormones secreted from the anterior pituitary gland. 3
13. a) "Fish gill use countercurrent oxygen exchange to maximize the uptake of oxygen"- justify this statement. 3
b) Explain how oxygen is carried out from gill to body tissue. 4
14. Write down short notes on any **TWO (02)** of the followings: **3.5 X 2 = 7**
 - i) Sexuality in fishes;
 - ii) HPG-axis
 - iii) Fick's Law of diffusion