Chattogram Veterinary and Animal Sciences University, Chattogram
Faculty of Fisheries
B. Sc. Fisheries (Hons.) Year-2, Semester-2 (July-December) Final Examination' 2021
Course Code: **FEC-202(T)** Course Title: **Fisheries Economics (Theory)**
Total Marks: 70.0   Time: 03 hours

*Answer **any 03 (Three)** questions from each section where question no. **1 and 5** are mandatory. Figure in the right margin indicate full marks. Use separate answer script for each section*

Section-A

1. a) Distinguish between demand and want. 3
   b) Briefly discuss the influencing factors of demand of fisheries products in Bangladesh. 4
   c) Why do demand curve slope downward? 4

2. a) Define utility. State and discuss the law of diminishing marginal utility with its limitations. 5
   b) How do you calculate the elasticity of demand at any point of the demand curve? 4
   c) When the price of edible oil rising from 120 Tk. to 260 Tk. per unit the resulting influence of the case edible oil market demand decreased 50 tonne from 62 tonne. Calculate the price elasticity of edible oil. 3

3. a) What are the steps followed in Tilapia fish farming in your area? 7
   b) How does a consumer reach at equilibrium with the help of indifference curve and budget line? 5

4. Write short notes on: 4 × 3 = 12
   a) Malthusian population theory
   b) Function of Central bank, and
   c) Marginal Rate of Technical Substitution (MRTS)

Section-B

5. a) What are the factors of production? 2
   b) Briefly discuss the law of diminishing return. 5
   c) At which stage of a production process, a rationale producer will produce and why? 4

6. a) Do you have any idea about micro-credit? 2
   b) Explain the different analytical framework (discounted) of farm business analysis. 5
   c) Illustrate national income. Describe the production method to measure the national income in Bangladesh. 5

7. a) How does market equilibrium arrive with the help of total revenue (TR) and total cost (TC) curve? 5
   b) Define Breakeven point. Suppose the fixed cost of a factory in Tk. 5,00,000, the per unit selling price is Tk. 10 and per unit variable cost is Tk. 6. What is the breakeven output of this factory? 7

8. Write short notes on: 4 × 3 = 12
   a) Economic importance of fish farming
   b) Explicit and Implicit cost, and
   c) Negative environmental impact on fish production

Chattogram Veterinary and Animal Sciences University, Chattogram
Faculty of Fisheries
B.Sc. Fisheries (Hons.) Year -2, Semester -2 (July-December), Final Examination, 2021
Course Code: **FPA 202 (T),** Course Title: **Fish Parasitology (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) Briefly describe the importance and role of parasitology in fisheries. 3
    b) Explain in details the different types of parasites according to the duration, habit and specificity on host. 4

2. a) Differentiate definitive host and intermediate host. 3
    b) Discuss briefly the causative agent, clinical sings, prevention and control of a disease caused by 'fish louse'. 4

3. a) What is tapeworm? Differentiate between bass tapeworm and broad tapeworm. 2
    b) Discuss the susceptible hosts, clinical signs, prevention and control measures of the bass tapeworm disease in fish. 5

4. a) Define grub and fluke. 2
    b) Briefly describe the life cycle of a digenetic trematode having zoonotic importance. 5

5. a) List down protozoan parasitic diseases of fish with their causative agents. 3
    b) Briefly discuss about Ichthyophthiriasis with the names and morphologies of the causative agents, site of infestations, clinical signs and control measures. 4

6. a) What do you know about the public health issues related to fish parasites? 3
    b) Describe a fish born parasitic nematodiasis with causative agents, clinical signs, and preventive measures. 4

7. Write short notes on **any two** of the following: 3.5x2=7
    a) Haemoparasitism; b) Hyperparasitism and c) Types of immunity

Section B

8. a) Write down the important characteristics of the major group of fish parasite. 3
    b) Explain in details the life cycle of *Ichthyophthirius multifilliis* parasite of fish. 4

9. a) Discuss the causative agents, clinical signs, treatment and control measure of Dactylogyrosis and Gyrodactylosis parasitic diseases. 7
    b) Discuss the causative agents, clinical signs, treatment and control measure of Myxosporidian Disease and Ichthyobodosis diseases.

10. a) Summarize the epidemiological triangle in Host-Parasite-Environment relationship. 3
    b) Briefly describe the factors affecting the ecology of fish parasite. 4

11. a) Distinguish between gill fluke and skin fluke. 3
    b) Illustrate the life cycle of the cestodes fish parasite. 4

12. a) What do you mean by zoonosis? 2
    b) Discuss major fish born zoonotic diseases with their symptom and treatment. 5

13. a) Summarize the site of infestation, attachment organ and host of the common parasitic fauna of freshwater fish. 3
    b) Discuss 'Argulosis' with its symptoms, pathology and biology. 4

14. Write short notes on **any two** of the following: 3.5x2=7
    a) Synoecious symbiosis; b) Enzootic symbiosis and c) Social symbiosis

*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) Distinguish between fish population and fish stock. — 3.0
   b) How do fisheries biologists contribute to fisheries science? Illustrate that a fish population is a simple biological system. — 4.0

2. a) Define density dependent effects and density independent effects. — 2.0
   b) Describe briefly the various types of spacing for individuals within a unit stock. — 5.0

3. a) Define isometric growth. — 2.0
   b) Derive the straight line equation from the length-weight relationship. — 2.0
   c) List down 5 commonly used tagging materials in fisheries study. What to do if you catch a tagged fish? — 3.0

4. a) Enlist the procedures for estimating parameters of 'Von Bertalanffy growth curve'. — 2.0
   b) Following table presents the age and length for Bombay duck population of the Bay of Bengal. Estimate the Von-Bertalanffy growth parameters K and $L\infty$. Assume $t_0=0$. — 5.0

Age (Year)	I	II	III	IV	V
Length (cm)	23	29	35	42	56

5. a) Illustrate a generalized life history triangle for fishes. — 2.0
   b) Define GSI. How do you calculate GSI for abalone? — 3.0
   c) Differentiate between synchronous and asynchronous ovary. — 2.0

6. a) 'Poor relationship exists between spawning stock and recruitment strength' – Justify. — 3.0
   b) Estimate the constants of 'Beverton & Holt' and 'Ricker' models algebraically. — 4.0

7. a) Mention the advantages of fast growth rate. — 2.0
   b) Write down the difficulties of single sample method with graphical illustration. — 5.0

Section-B

8. a) Show schematically that a fish population is a simple biological system. — 3.0
   b) Why does a fish population size fluctuate? — 2.0
   c) Differentiate between vulnerability and catchability. — 2.0

9. a) Differentiate between fishing mortality and natural mortality. — 2.0
   b) A cohort of 100 individuals belong to a fish stock suffers a constant mortality of 20% per year. Calculate the % survival and mortality of that cohort at the end of 3 years. — 3.0
   c) Why the initial data points not included in regression line in age are based catch curve? — 2.0

10. a) Describe the reasons for death in a fish population. — 3.0
    b) Estimate percent survival of a fish stock algebraically. — 4.0

11. a) "Measure of CPUE is a poor index of stock abundance" - explain. — 2.0
    b) Describe the importance of weight measurement in fisheries work. — 3.0
    c) Why does the uniform type of spacing of individuals rarely occur in nature? — 2.0

12. a) Illustrate the event and inter event phases of life history of exploited species. — 2.0
    b) Enlist the factors responsible for gonadal maturation. — 2.0
    c) Define L_m. How will you adjust the proportion of sexual mature individual to estimate L_m? — 3.0

13. a) Enlist most common reason of natural mortality. — 2.0
    b) How do you obtain equation to estimate mortality rate algebraically in age based catch curve? — 5.0

14. a) Define MSY. — 2.0
    b) Elaborate the concept of MSY in Surplus Yield Model with appropriate figures. — 5.0

Chattogram Veterinary and Animal Sciences University, Chattogram
Faculty of Fisheries
B. Sc. Fisheries (Hons.) Year -02 Semester-02 (July-December), Final Examination 2021
Course Code: **FOC-202 (T)**, Course Title: **Fisheries Oceanography (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)	How geological layers of the earth vary in characteristics and composition?	3
	b)	Explain the mechanisms of ocean floor spreading and trench formation.	4
2.	a)	What is mid-oceanic ridge?	1
	b)	Draw and describe a generalized model of ocean floor topography.	4
	c)	Differentiate bay from gulf with examples.	2
3.	a)	Define sediment. Classify sediment on the basis of sources.	4
	b)	How ooze differ in composition?	3
4.	a)	What is ocean tide? What causes the tide in the ocean?	3
	b)	Why are tides more affected by the moon while the gravitational attraction on earth by the sun is larger than that of the moon?	4
5.	a)	What is boundary current?	1
	b)	How thermohaline circulation forms and travels around the world?	3
	c)	How equatorial upwelling is impacted by the El Nina event.	3
6.	a)	Write down the major constituent of sea water.	2
	b)	What do you understand by residence time of sodium in ocean?	2
	c)	How temperature, density and salinity of seawater are correlated?	3
7.		Write short notes on **any two** of the following:	3.5×2 = 7

    a) T-S diagram,   b) Bioturbation, and   c) Big bang.

Section B

8.	a)	Outline the differences between oceanic and continental crust.	2
	b)	How crusts are regularly being created and destroyed?	3
	c)	Classify convergent plate boundaries.	2
9.	a)	What is red clay?	1
	b)	How current bedding is different from graded bedding in sediment arrangement?	3
	c)	How the distributions of marine sediment vary with location and depth?	3
10.	a)	What is ocean wave? At what depth ocean wave breaks?	2
	b)	Which properties determine whether a wave is constructive or destructive?	2
	c)	Classify waves on the basis of wave length.	3
11.	a)	What is surface ocean current?	1
	b)	Describe the mechanism of longshore drift.	3
	c)	Mention the formation and way out of a rip current.	3
12.	a)	Mention the oceanographic properties of the Bay of Bengal (BoB)?	2
	b)	What do you know about the upwelling pattern in the BoB?	2
	c)	Write about the trench and turbidity current of the BoB.	3
13.	a)	Define shoreline. Differentiate between coastal and marine environment?	3
	b)	Classify marine pelagic and benthic habitat with diagram.	4
14.		Write short notes on **any two** of the following:	3.5×2 = 7

    a) Fishing ground in BoB,   b) Gulf stream, and   c) Sediment transportation.

Chattogram Veterinary and Animal Sciences University, Chattogram
Faculty of Fisheries
B. Sc. Fisheries (Hons.) Year -02 Semester-02 (July-December), Final Examination 2021
Course Code: **CZM-202 (T)**, Course Title: **Coastal Zone Management (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 and use separate answer script for each section.*

Section-A

1.	a)	What are the purposes of integrated coastal zone management?	2.0
	b)	Illustrate the landward and seaward boundaries of the coastal zone of Bangladesh.	2.0
	c)	Sketch the geomorphological structure of coastal and marine environment of Bangladesh with brief description.	3.0
2.	a)	What do you mean by land use conflicts of the coastal zone?	1.0
	b)	How can you specify the land use and land cover?	2.0
	c)	Establish a matrix correlation among the present and potential uses and activities with its interaction process.	4.0
3.	a)	Differentiate between depositional and erosional coastal with specific examples.	3.0
	b)	Categorize the coast on the basis of their formation and revolutionary process.	4.0
4.	a)	Why is the seven-tier management approach important for coastal planning?	2.0
	b)	Illustrate the different level of tier management strategies from coastline up to 12 nm limit along the coastal belt.	5.0
5.	a)	What do you mean by ecotourism?	1.5
	b)	Mention the tourism facilities in the coastal zone of Cox's Bazar.	2.5
	c)	How the ecotourism activities enhance the blue economic development in Bangladesh?	3.0
6.	a)	How can you specify the coastal zone plan (CZP)?	2.0
	b)	Exemplify briefly a conceptual model of CZP with its step by step planning process.	5.0

7. Write short notes on any **02 (two)** of the following: 3.5×2 = 7.0
   a) Beach nourishment,   b) RS in CZM, and   c) Assets pentagon.

Section-B

8.	a)	Specify the major functions of CZM.	2.0
	b)	How ICZM addresses the land-sea area simultaneously?	3.0
	c)	In which way the coastal region impacted by distant events that occur far inland region?	2.0
9.	a)	Distinguish between land breeze and sea breeze.	2.0
	b)	Specify the process and impact of sea breeze in the coastal ecosystem.	2.0
	c)	Explain the influence of local winds on coastal weather condition including the southwest and northeast monsoonal effects.	3.0
10.	a)	Why mangrove restoration and regeneration is important for Bangladesh?	2.0
	b)	Formulate your own plan with recommendation for restoration of Chakaria Sundarban mangrove forest of Bangladesh.	5.0
11.	a)	How would you define coastal vulnerability?	1.0
	b)	Write down the basic components of GIS used in coastal vulnerability management.	2.0
	c)	Illustrate briefly the different coastal vulnerability categories with their components and specific examples.	4.0
12.	a)	What's the significance of coastal vegetation on coastal stability?	3.0
	b)	Explain in brief how the nature-based solutions as well as eco-engineering approaches are essential to ensure long term coastal stability.	4.0
13.	a)	What do you mean by coastal resource mapping?	2.0
	b)	Prepare the resource map of St. Martin's Island and mention their role in eco-tourism development.	5.0

14. Write short notes on any **02 (two)** of the following: 3.5×2 = 7.0
   a) Territorial baselines.   b) SLA framework, and   c) Carbon sequestration in coastal ecosystems.

*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 Microbiology. Mention significant contributions of the father of modern Microbiology? — 3
   b) "Microbiology is a multidisciplinary science"-explain. — 4

2. a) "Spontaneous generation" was a matter of controversy in the early history of Microbiology-why? — 3
   b) What do you know about the germ theory of disease? — 2
   c) Write down the general characteristics of marine bacteria. — 2

3. a) Briefly write the history of "microscopy". — 3
   b) How do you distinguish true yeast and false yeast? — 2
   c) Write down geographical distribution of microorganisms in nature. — 2

4. a) Compare biochemical characteristics of Gram-positive and Gram-negative bacterial cell walls. — 3
   b) Classify bacteria on the basis of oxygen requirement and arrangements of flagella on surface of the bacterial cell with example. — 4

5. a) Differentiate between virus and virion. — 2
   b) Classify virus based on their morphology with example. — 3
   c) Write down functions of viral capsid. — 2

6. a) Write down fundamental differences between prokaryotic and eucaryotic cells. — 2
   b) Write down steps of asexual mold reproduction with the help of diagram. — 2
   c) What is piscirickettsiosis? Name the causative agents along with sign and symptoms of disease. — 3

7. a) Differentiate between microbial food infection and food intoxication. — 2
   b) What is botulism? Write down characteristics of its causative agent. — 2
   c) Briefly describe the occurrence, symptoms, and prevention of listeriosis. — 3

Section B

8. a) Differentiate DNA and RNA viruses with examples. — 3
   b) Briefly describe different steps of multiplication of Bacteriophage with illustration. — 4

9. a) Why bacterial spores are called cryptobiotic? — 1
   b) Why spores are more heat-resistant than vegetative cells? — 2
   c) Show the steps of endospore formation in a bacterial cell with a labelled diagram. — 4

10. a) Why bacterial growth is called "autocatalytic"? — 2
    b) What is putrefaction? What will happen when microbes act upon amino acids? — 2
    c) Write down important distinguishing characteristics of the following genera: i) *Pseudomonas* and ii) *Clostridium*. — 3

11. a) Briefly discuss effect of water activity (a_w) and pH of food on the growth and activity of microorganisms. — 3
    b) What interactions are expected during the growth of mixed bacterial populations? — 3
    c) What is generation time of microorganisms? Write down the generation time of bacteria, mold and yeast. — 1

12. a) Define disinfection. How chemical disinfectants kill microorganisms? — 2
    b) What is phenol coefficient? Enumerate the properties of an ideal disinfectant. — 3
    c) Write a short note on botulism. — 2

13. a) What do you mean by immunity? Differentiate between active and passive immunity. — 3
    b) "All antibiotics are antimicrobial agent but all antimicrobial agents are not antibiotic"- explain with example. — 2
    c) What is vaccine? Write down the names of different substances used as vaccine. — 2

14. a) Compare aquatic and terrestrial bacteria. Give genera name of 4 proteolytic bacteria. — 3
    b) What are the sanitary index organisms? Why they are called so? — 2
    c) Define coliform bacteria. Write down the characteristics of coliform bacteria that make them important in the food industry. — 2

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 term fish physiology. — 1
    b) Differentiate between physiology and anatomy. — 2
    c) How you will apply your fish physiological knowledge to boost up the aquaculture production in Bangladesh? — 4

2. a) Point out the effect of extreme temperature on fish physiology. — 2
    b) Why thermal regulation is important for fish? — 2
    c) How do polar fishes maintain their body temperature? — 3

3. a) What do you know about zymogen? — 2
    b) Briefly describe the lipid digestion process in fish. — 5

4. a) What do you know about fish blood? — 1
    b) Write down the components and functions of leucocytes. — 3
    c) Distinguish between the open circulatory system and the closed circulatory system. — 3

5. a) Define excretion. — 1
    b) Distinguish between the kidney of freshwater and marine teleosts. — 2
    c) Suppose that the concentration of salt is higher in the surrounding environment than the fish body. What will be the osmoregulatory strategies for that fish to be in a homeostasis condition? — 4

6. a) What do you know about reproduction? — 2
    b) Briefly describe the multiple forms of sexuality found in fishes with proper example. — 5

7. Write short notes on any two of the following: — $3.5 \times 2 = 7$
    a) Accessory respiratory organ; b) Renal corpuscle; c) Chyme, and d) Parthenogenesis

Section-B

8. a) Explain the following terms: Q_{10}, piloerection, and rete mirabile? — 3
    b) Summarize the physiological mechanisms that makes a fish poikilotherms. — 4

9. a) Enlist six digestive enzymes with their secretion place, digestible food types and function. — 3
    b) Describe different factors that affect gastric emptying in fish. — 4

10. a) "Metabolism is a pre-requisite body physiology for meeting energy demand in fish body"- justify. — 2
    b) Compare and contrast between catabolism and anabolism. — 2
    c) How do body size, starvation and temperature affect the metabolism in fishes? — 3

11. a) Define respiration. — 1
    b) Distinguish between concurrent and countercurrent exchange. — 2
    c) Enumerate the role of pH on the loading/unloading capacity of oxygen to haemoglobin by Bohr effect. — 4

12. a) Point out the major excretory organs found in different aquatic organisms. — 2
    b) Illustrates and describe the excretory process of major waste products from the fish body. — 5

13. a) What is pheromone? — 2
    b) Enlist the major types of pheromones found in fishes. — 2
    c) Briefly describe role of pheromone in different animal groups. — 3

14. Write short notes on any two of the following: — $3.5 \times 2 = 7$
    a) HPG axis; b) Absorption; c) Fick's law of diffusion, and d) Chloride cell