

**Chattogram Veterinary and Animal Sciences University, Chattogram**  
**Faculty of Fisheries**  
 B. Sc. Fisheries (Hons.) Year -3 Semester-1, Final Examination' 2019  
 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. 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) Justify the significance of studying fish genetics.  | 2 |
|    | c) Illustrate the distinguishing features of prokaryotic and eukaryotic cell.                     | 3 |
| 2. | a) What is mitosis? Explain the mitotic cell division process of a eukaryotic cell with figures.  | 6 |
|    | b) What are the significances of meiosis?   | 1 |
| 3. | a) What is DNA template, replication fork and Okazaki fragments?                                  | 2 |
|    | b) Illustrate the mechanism of DNA replication process in eukaryotes.                             | 5 |
| 4. | a) Classify chromosomes on the basis of centromere.   | 3 |
|    | b) Discuss chromosomal variations with consequences.  | 4 |
| 5. | a) Define gene, allele, locus, and genotype.  | 2 |
|    | b) Explain the chemical compositions of a eukaryotic chromosome.                                  | 3 |
|    | c) Distinguish between DNA and RNA.   | 2 |
| 6. | a) State the 'Law of segregation'. How does it differ from 'Law of Independent Assortment'?       | 2 |
|    | b) Discuss dominant epistatic interaction with an example.  | 5 |
| 7. | a) What is population genetics?   | 1 |
|    | b) Define gene and genotype frequency. Explain the factors affecting gene and genotype frequency. | 4 |
|    | c) What does Hardy-Weinberg principle state? Mention the underlying assumptions of it.            | 2 |

**Section B**

- |     |  |             |
|-----|--|-------------|
| 8.  | a) What is cell and cell cycle?  | 1           |
|     | b) Draw a labelled diagram of an animal cell. Write the functions of ribosome, endoplasmic reticulum, lysosome and mitochondria. | 5           |
|     | c) Differentiate between karyokinesis and cytokinesis.   | 1           |
| 9.  | a) What is mutation?   | 1           |
|     | b) Illustrate the different types of gene mutation.  | 6           |
| 10. | a) What is genetic linkage and linked gene?  | 1           |
|     | b) How does genetic linkage work?  | 4           |
|     | c) What are the differences between action of linkage and independent assortment?  | 2           |
| 11. | a) What is gonochorism and sexual dimorphism?  | 1           |
|     | b) Explain the secondary sexual characters observed in fishes with examples.   | 4           |
|     | c) What are the different modes of reproduction found in fishes?   | 2           |
| 12. | a) Distinguish between qualitative and quantitative characters?  | 2           |
|     | b) What are the components of phenotypic variance?   | 2           |
|     | c) 'V <sub>D</sub> cannot be inherited but V <sub>A</sub> is never disrupted'-justify.   | 3           |
| 13. | a) What is meant by sex determination?   | 1           |
|     | b) Discuss the sex determination systems found in fishes.  | 6           |
| 14. | Write down short notes on any <b>02 (Two)</b> of the following:  | 3.5 × 2 = 7 |
|     | i) Multiple allelism; ii) Heritability; iii) DNA packaging.  |             |

Chittagong Veterinary and Animal Sciences University, Chittagong  
Faculty of Fisheries

B.Sc. Fisheries (Hons.) Year-03, Semester-01; Final Examination, 2019  
Course Code: CCF-301(T), Course Title: Climate Change and Fisheries (Theory)

Full marks: 70; Time: 3 hours *Old Curriculum*

Answer any 05 (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 'climate change'. 1  
(b) What are the basic causes of climate change? 2  
(c) How does global warming drive climate change? 4
2. (a) Differentiate between anticipatory and reactive adaptation response. 2  
(b) Why are coastal zones vulnerable in Small Island Developing States? 2  
(c) Develop a model for planning adaptation response to negative climate. 3
3. (a) How does ocean become stratified day by day? 2  
(b) Describe the impacts of acidification on oceanic ecosystems. 5
4. (a) Define Sensitivity, Adaptability and Vulnerability in light of climate change. 3  
(b) What are the strategies to allow ecosystems to adapt naturally to climate change? 4
5. (a) Develop a comparison on the impacts of artisanal and marine fisheries due to climate change. 4  
(b) How institutional activities influence adaptation process due to vulnerability of climate change? 3
6. (a) How the 'values of aquaculture product' vary in different climatic regions of the globe? 3  
(b) Briefly describe the impacts of climate change on culture fisheries in current context of Bangladesh. 4
7. (a) Name four major international entities work for global negotiations on climate change. 2  
(b) What are the outcomes of the Kyoto Protocol? 2  
(c) Discuss about world alliance for efficient solutions of climate change problem. 3

**Section B**

8. (a) Point out the evidence that climate is changing. 2  
(b) Early warning is an anticipatory adaptation- Justify this statement. 2  
(c) Discuss the impacts of climate change on livelihood of the fishing communities. 3
9. (a) Why fresh water is more vulnerable to climate change? 2  
(b) Write your comprehensibility regarding human involvement in current climate change. 5
10. (a) Define vulnerability and adaptation response in climate change? 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
11. (a) Illustrate 'food chain' and 'food web' in oceanic ecosystem. 3  
(b) How food webs are impacted through climate change? 4

12. (a) Why coral reef island is a vulnerable resource? How can you overcome such vulnerability? 3  
(b) How will you linked 'species invasion and disease' with climate change? 4
13. (a) What does 'IPCC' stands for? Enlist its aims. 3  
(b) Write the beneficial role of IPCC reports in meeting the recent challenges to climate change across the globe? 4
14. (a) Define 'climate change adaptation'. 1  
(b) How aquaculture can contribute in climate change adaptation? 3  
(c) What are the institutional arrangements for climate change programming in Bangladesh? 3

**Chattogram Veterinary and Animal Sciences University, Chattogram**  
**Faculty of Fisheries**

B. Sc. Fisheries (Hons.) Year -3 Semester-1, Final Examination' 2019

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) Write down general principles of fish processing. What are the main factors responsible for fish spoilage? 3  
b) Categorize different fish processing techniques. Describe the importance of studying fish processing at your current semester. 4
2. a) What is rigor? Explain the changes of organic phosphate in fish body during rigor process. 3  
b) How does rigor affect handling and processing? 'Freezing before rigor or in-rigor or after rigor' – which is the best and why? 4
3. a) What is fish smoking? Differentiate between hot and cold smoking of fish. 4  
b) How does a wood smoke preserve fish? 3
4. a) Define fish freezing. Classify different freezing methods commonly employed for fish processing. 4  
b) Discuss physical and chemical changes in frozen fish during storage. 3
5. a) What is the significance of "Thermal Arrest Period" in fish freezing? 3  
b) Calculate the total energy required to freeze 20 kg of shrimp from 30°C ambient temperature to at -40°C by a spiral freezer. 2  
c) Write down the impact of three freezing steps in fish freezing. 2
6. a) What is cryopreservation? What are the advantages of air blast freezer over other methods of fish freezing? 3  
b) Describe a detail processing protocol of shrimp freezing using contact plate freezer. 4
7. Write down short notes (**any TWO**) on following: 3.5 X 2 = 7  
i) Cold storage of frozen fish; (ii) Hilsha marketing channel; (iii) Solar tent dryer.

**Section B**

8. a) What do you mean by fermentation? Write the names (product) and origin (country) of fish sauces and pastes available in Southeast-Asia. 3  
b) Write down chemical composition of 'Nam-pla'(Thailand). Give a detail processing protocol of 'Nga-pi'. 4
9. a) Write basic principles of canning. What are the main factors needed to consider to establish a fish canning industry? 3  
b) Give a brief description on fish canning procedure follows in commercial canning industry. 4
10. a) What do you know about 'thronging' and 'depuration'? Write the functions of salting, blanching and pre-cooking steps in canning process. 3  
b) How will you justify canning is the best method of processing leads to preserve all the methods practiced? Describe '12 D concept' in fish canning. 4
11. a) What are the features to be considered to select an ideal can container? Why two-piece is better than the three-piece can? 3  
b) Write the common problems associated with canned fishery products. 4
12. a) Briefly describe spoilage occurs during storage of salted fishery products. 3  
b) How canning influences the quality of foods? Classify foods on the basis of acidity. 4
13. a) What is freeze drying? Write advantages and disadvantages of freeze dried products. 3  
b) How does irradiation play significant role to extend self-life of fish and fishery products? Write three main sources of ionizing radiation. 4
14. Write down short notes (**any TWO**) of the following: 3.5 X 2 = 7  
i) IQF (individual quick freezing); (ii) Z value and F value in TDT curve;  
(iii) MAP (modified atmospheric packaging).

**Chattogram Veterinary and Animal Sciences University, Chattogram**

**Faculty of Fisheries**

B. Sc. Fisheries (Hons.) Year-3, Semester-1, Final Examination- 2019

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 scr 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) Define social institution. 1  
b) What are the main social institutions in Bangladesh? 2  
c) What are the characteristics of social institution? 4
3. a) Explain the various characteristics of culture in Bangladesh. 3  
b) Describe different types of resources. 4
4. a) How are social activities related to environmental pollution? 3  
b) Discuss the major causes of environmental pollution in Bangladesh. 4
5. a) 'Culture is what we are, civilization is what we use' - Explain the statement. 3  
b) Explain the components of culture. 4
6. a) What is agro-fishery? 1  
b) Define concept of social development. 2  
c) Analyse the impact of GO- NGO collaboration in the development of Bangladesh. 4
7. Write short notes on the followings:  
a) Cultural lag 3.5  
b) Socialization 3.5

**Section B**

8. a) Why do the rural people migrate to the urban areas? Explain. 3  
b) Describe the social and economic differences between rural and urban societies. 4
9. a) Define social change. 2  
b) Enumerate the various factors that cause the social change. 3  
c) What is meant by sustainable livelihood approach? 2
10. a) Briefly discuss the steps for conducting a social research. 4  
b) Describe the types of sociological methodology. 3
11. a) What is gender division of labour? 2  
b) What are the causes of gender discrimination in the fisheries sector from the socio-economic perspective of Bangladesh? 5
12. a) Define social control. 1  
b) Write the types of social control. 3  
c) What is public opinion? How do various agencies play role in raising public opinion? 3
13. a) Mention some common social problems in Bangladesh. 3  
b) Discuss different kinds of psychological needs. 4
14. Write short notes on the followings:  
a) Integrated farming system 3.5  
b) Leadership 3.5

**Chattogram Veterinary and Animal Sciences University, Chattogram**

**Faculty of Fisheries**

B. Sc. Fisheries (Hons.) Year -3, Semester-1, Final Examination' 2019

Course No: IOA-301 (T), Course Title: **Integrated and Organic Aquafarming (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 'Integration?' 2  
b) What is the contribution of integration in aquaculture? 2  
c) Show the acceptance of integrated aquaculture for the rural people. 3
2. a) Illustrate the principles of an organic fish production system. 3  
b) Explain the system components of the most common organic aquaculture practices. 4
3. a) What are the different types of fish culture in rice field? 2  
b) Describe the operation and management of fish culture in the rice field. 3  
c) Show the cost-benefit analysis of a rice-fish culture farm. 2
4. a) Integrated fish farming enhances the socio-economic status of rural people - Justify. 2  
b) Integrated aquaculture is treated as artificial balanced ecosystem where there is no waste ---Explain the statement. 3  
c) Integrated farming system is more complex than conventional system ---- Justify. 2
5. a) Develop some guiding principles for successful organic farming in contrast to Bangladesh. 3  
b) "IFCAS is for floodplain and IMTA is for drought areas" -justify this statement. 4
6. a) Justify the necessity of biosecurity in an integrated and organic aquafarm. 3  
b) "Disease and other risk factors can be controlled through biosecurity" - how? 4
7. Write down short notes on any two of the followings: 3.5 X 2 = 7  
a) Organic certificate system; b) Autotrophic and Heterotrophic pathways; c) IMTA

**Section B**

8. a) What are the basic differences between agro-based and livestock fish farming? 3  
b) Describe the multi-component integrated culture system of fish in a suitable area. 4
9. a) Choose an appropriate management style for an integrated and organic aquafarm. 3  
b) How will you adjust your long term plan with yearly plans? 4
10. a) Illustrate the flow of energy in a complex integration system. 3  
b) Select the most feasible integrated system and justify it. 4
11. a) "Composting can be the best solution for waste management" - do you agree or not? 3  
b) How flood and drought can promote the aquaculture business? 4
12. a) Show the difference between Organic aquaculture and conventional aquaculture. 2  
b) Describe the present position of Organic aquaculture on the basis of production status, environmental issues and laws of regulations. 5
13. a) Develop an appropriate way of waste management in aquaculture. 3  
b) Write the actions of waste on aquaculture practices. 4
14. Write down short notes on any two of the followings: 3.5 X 2 = 7  
a) Suitable species for rice-fish culture; b) Nursery in rice -field; c) Home-based aquaponics (HA)

Chattogram Veterinary and Animal Sciences University, Chattogram

Faculty of Fisheries

B. Sc. Fisheries (Hons.) Year -3 Semester-1, Final Examination' 2019

Course No: SFB-301 (T), Course Title: Shellfish Biology (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 shellfish and finfish. 1  
b) Briefly describe the present status of shellfish resources of Bangladesh. 3  
c) Write the importance of studying Shellfish Biology course in the context of Bangladesh. 3
2. a) Write down the functions of the following organs found in shellfish: i) radulla; ii) green gland; iii) siphon and iv) crop. 2  
b) Why shellfish are called bioindicators of waterbody? 3  
c) Enlist major shellfish poisoning occurred due to shellfish consumption. 2
3. a) Compare the morphological features of gastropods and bivalves. 2  
b) Draw labeled anatomy of a typical molluscan species. 2  
c) Describe briefly the reproductive biology of *Pila* sp. 3
4. a) State the basic identifying characteristics of the Phylum Mollusca. 2  
b) Describe briefly the reproduction and life history of green mussel. 5
5. a) Why Octopus is considered most intelligent invertebrates? 2  
b) Write down the morphological features of *Nautilus* sp. 2  
c) Describe the life cycle of *Loligo* sp. 3
6. a) How would you differentiate trochophore larva from veliger larva? 2  
b) 'Mud crabs are euryhaline species'-why? 2  
c) Discuss the larval developmental process of mud crab (*Scylla serrata*). 3
7. a) Name five (5) oyster species available in Bangladesh. 2  
b) How shells are formed in oysters? 2  
c) Diagrammatically outline the life cycle of an oyster. 3

Section B

8. a) Write the key identifying features of Crustacea. 1  
b) Enlist five (5) lobster species available in Bangladesh with their scientific and common names. 2  
c) Write the food and feeding habits, age and growth, shell formation and regeneration of a lobster species available in the Bay of Bengal. 4
9. a) Compare the morphological differences between a male and a female shrimp. 2  
b) Describe the reproduction and life cycle of *Penaeus monodon*. 5
10. a) Point out the ecological importance of Crayfish. 2  
b) Briefly describe the reproduction and development of Crayfish. 5
11. a) What do you know about blister pearl and free pearl? 2  
b) What is mother of pearl? Describe the pearl formation process in mollusc with figure. 5
12. a) Name the factors that affect the abundance and health condition of shellfish. 2  
b) Briefly describe the environmental factors that affect the abundance and biodiversity of shellfish. 5
13. a) Define biodiversity. What are the causes of decreasing shellfish resources in Bangladesh? 2  
b) Explain the mitigation techniques to sustain abundance and biodiversity of shellfishes. 5
14. Write down short notes on any 02 (Two) of the following: 3.5 × 2 = 7  
i) Eye stalk ablation; ii) Embryonic development of *Octopus* sp and iii) Shell formation of *Meritrix*.

Chattogram Veterinary and Animal Sciences University, Chattogram  
Faculty of Fisheries  
B.Sc. Fisheries (Hons.) Year-03 Semester 01, Final Examination 2019  
Course No.: **IFM-301(T)**, Course Title: **Inland Fisheries Management (Theory)**  
Total Marks: 70, Time: 3 hours

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

**Section A**

- |    |    |   |   |
|----|----|---|---|
| 1. | a) | Mention the economic importance of Hilsa fisheries in Bangladesh                  | 3 |
|    | b) | Give the flow diagram of hilsa marketing system in Bangladesh                     | 4 |
| 2. | a) | Define sport fishing.   | 2 |
|    | b) | Give your suggestions to improve recreational fisheries in Bangladesh.            | 5 |
| 3. | a) | Write down the objectives of inland fisheries management.                         | 3 |
|    | b) | Discuss the challenges in managing inland fishers.                                | 4 |
| 4. | a) | What do you mean by habitat restoration?  | 2 |
|    | b) | Briefly describe the multipurpose use of inland waterbodies.                      | 5 |
| 5. | a) | How does fisheries cooperative help in fisheries management?                      | 3 |
|    | b) | Discuss the general principles to form a cooperative.                             | 4 |
| 6. | a) | What are the general principles of recreational fisheries management?             | 3 |
|    | b) | Explain different types of conflicts in recreational fisheries management.        | 4 |
| 7. | a) | What are the key indicators to assess the achievement of sustainable livelihoods. | 2 |
|    | b) | Analyze the livelihood assets of a typical fisherman.                             | 5 |

**Section B**

- |     |    |  |   |
|-----|----|--|---|
| 8.  | a) | Define fisheries regulations.  | 2 |
|     | b) | Briefly describe the categories of fisheries regulations.                                | 5 |
| 9.  | a) | Briefly describe the various recreational water resources and activities in Bangladesh.  | 2 |
|     | b) | Give the possible suggestions for the development of recreational fisheries.             | 5 |
| 10. |    | Give your idea to restore habitat in the Halda river, Bangladesh.                        | 7 |
| 11. |    | Make a plan for the sustainable fisheries management in the Kaptai lake, Bangladesh.     | 7 |
| 12. |    | Analyze SWOT to develop a cooperative society of FoF 5th batch to do fisheries business. | 7 |
| 13. | a) | Show the Hilsa fish nursing area in the map of Bangladesh.                               | 2 |
|     | b) | Make your opinion regarding present Hilsa fisheries strategies in Bangladesh.            | 5 |
| 14. | a) | “Sustainability is a concept often paraphrased as don’t cheat your kids”- justify.       | 2 |
|     | b) | Point out the primary considerations for sustainable fisheries management.               | 5 |



# Chittagong Veterinary and Animal Sciences University, Chittagong

## Faculty of Fisheries

B. Sc. Fisheries (Hons.) Year -3 Semester-1, Final Examination' 2019

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) Define pollutant. Narrate the simple types of pollutants. 3.0  
b) What are the major sources of pollutants of the aquatic environment? 2.5  
c) How pollutants can deteriorate the water quality? 1.5
2. a) Categorize the toxins according to their origin with appropriate examples. 2.0  
b) Discuss the actions of toxins in human body especially in the organs. 5.0
3. a) Discuss the reasons and outcomes of anoxic condition in a water body. 3.0  
b) Relate the impact of widespread anoxic condition with the mass extinction of species from the oceans during the Triassic period. 4.0
4. a) What do you mean by Bio-amplification? Highlight on this topic relating a case study in a water body. 3.0  
b) Sketch and label the diagrammatic representation with indication of their dissimilarities. 4.0
5. a) Interpret the most efficient ventures for conserving the biodiversity against pollution in the Bay of Bengal. 3.0  
b) Briefly discuss the major reasons and the possible outcomes regarding thermal pollution. 4.0
6. a) Differentiate between sewage and sludge. 1.0  
b) Show the composition of a typical sewage with diagram. 2.0  
c) Shortly describe the sewage pollution of Chittagong City. 4.0
7. Write down short notes on the followings (**Any Two**): 3.5 X 2 = 7  
(i) Bio-magnification; (ii) Ecological indicators;  
(iii) PAHs; (iv) Halogenated hydrocarbons.

### Section B

8. a) How can you characterize the freshwater and marine water pollution? 2.0  
b) What are the major sources of freshwater and marine water pollution? 3.0  
c) What can you do for preventing fresh and marine water pollution? 2.0
9. a) According to your perspective, when and how do the regular drugs and cosmetics become toxins? 3.0  
b) Compose a flow chart concerning the exposure of toxicants along with the biological organisations maintaining the chronology. 4.0
10. a) Are algal blooms harmful for all the waterbodies around the world? Appraise your opinion along with specific reasoning. 3.0  
b) Suppose, you are a fisheries officer, considering on-going problems of fish farmers in your locality, regarding eutrophication and algal blooms, formulate a framework for cost-effective remedial methods. 4.0
11. a) Denote the term "oil spill". What are the prime sources of oil spill in the ocean? 2.0  
b) As a marine scientist, what would be your major concern if oil spill occurs in your surrounding marine region? 2.0  
c) Generalize the physical, chemical and biological treatment techniques for the removal of oil. 3.0
12. a) What do you mean by POPs? Why POPs are considered as hazardous pollutants for human and other living organisms? 3.0  
b) Denote the types of agrochemicals. How do these hamper the aquatic environment? 4.0
13. a) Write down the name of some commonly used antibiotics in an aquafarm? How these types of products can affect on the immune system of target and non-target species? 3.0  
b) What will be the consequences of continuous interaction of escaped farmed stock and wild species in an aquatic system? 2.0  
c) What do you know about the destruction of habitat and wildlife by coastal aquaculture? 2.0
14. Write down short notes on the followings (**Any Two**): 3.5 X 2 = 7  
(i) Bioremediation; (ii) Heavy metal pollution;  
(iii) Lethal and sub-lethal effect of pollution; (iv) Maritime laws.

**Chattogram Veterinary and Animal Sciences University, Chattogram**  
**Faculty of Fisheries**

B. Sc. Fisheries (Hons.) Year -3, Semester-1, Final Examination' 2019

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 mark. Use separate answer script for each section.*

**Section-A**

1. a) Explain the followings- Necrosis, Edema and Septicemia. 3  
b) Enumerate the factors producing diseases in fish. 4
2. a) Define bacteria. 2  
b) Name four important bacterial diseases in Bangladesh aquaculture. 2  
c) Classify fish pathogenic bacteria with their characteristics and examples. 3
3. a) What are the importances of studying fish pathology? 2  
b) Describe renal pathology and respiratory pathology. 5
4. a) Differentiate between infectious disease and non- infectious disease. 2  
b) Discuss some nutritional diseases in fish. 5
5. a) Distinguish between the following: 3  
i) Lesion and ulcer; and ii) Hyperemia and hyperplasia  
b) Describe SVC with its etiology, epizootiology, symptoms, pathology and distribution. 4
6. a) Enlist some infectious diseases of lobster. 2  
b) Describe any two of them. 5
7. Write down short notes on any two of the followings: 3.5 X 2 = 7  
a) IPN; b) Epizootiology; c) Vibriosis

**Section B**

8. a) How environment is responsible for producing diseases in aquaculture? 2  
b) Explain some diseases caused by environment in shrimp. 5
9. a) Explain present status of shrimp culture in Bangladesh. 3  
b) Describe larval mycosis in shrimp. 4
10. a) Define stress and describe its stages. 2  
b) Describe various types of stressors with their effects on fish. 5
11. a) Classify fish pathology. 1  
b) Explain two infectious diseases of molluscs. 6
12. a) Define virion. 2  
b) Name five important viral diseases in aquaculture. Discuss a viral disease that is not common in Bangladesh aquaculture. 5
13. a) What do you mean by disease diagnosis? 2  
b) Write in brief about the causes and process of cell degeneration. 5
14. Write down short notes on any two of the followings: 3.5 X 2 = 7  
a) White spot syndrome; b) EUS; c) Edema

**Chattogram Veterinary and Animal Sciences University, Chattogram**

**Faculty of Fisheries**

B. Sc. Fisheries (Hons.) Year -3, Semester-1, Final Examination' 2019

Course No: FPI-301 (T), Course Title: **Fish Pathology and Immunology (Theory) (Old curriculum)**

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 disease, infection and diagnosis. 3  
b) Briefly describe the factors producing diseases in fishes. 4
2. a) Give a list of fish pathogenic bacteria with their characteristics. 3  
b) Explain one bacterial disease of fish with etiology, epizootiology, symptoms, pathology, diagnosis and treatment. 4
3. a) What are the importances of studying fish pathology? 2  
b) Describe renal pathology and respiratory pathology. 5
4. a) Define immunity. 2  
b) Discuss the cellular factors of non specific immunity in fish. 5
5. a) Differentiate between infectious disease and non- infectious disease. 3  
b) Discuss some nutritional diseases in fish. 4
6. a) Classify acquired immunity. 4  
b) Compare active and passive immunity with their specific characteristics. 3
7. Write down short notes on any two of the followings: 3.5 X 2 = 7  
a) Antibiotic sensitivity; b) Complement; and c) Columnaris disease.

**Section B**

8. a) What are the criteria for antigenicity? 3  
b) Describe two rapid immunological tests for antigen and antibody. 4
9. a) Draw and label the different parts of a typical bacterial cell. 2  
b) Describe Motile Aeromonas Septicemia with its etiology, clinical signs, and distribution. 5
10. a) Give a list of viral diseases in fish with their etiology. 2  
b) Discuss any two of them. 5
11. a) Classify fish pathology. 4  
b) Explain the phagocytosis process. 3
12. a) Define virion. 2  
b) Name five important viral diseases in aquaculture. Discuss a viral disease that is not common in Bangladesh aquaculture. 5
13. a) How environment is responsible for producing diseases in aquaculture? 3  
b) Explain some diseases caused by environment in fish. 4
14. Write down short notes on any two of the followings: 3.5 X 2 = 7  
a) Immunodeficiency; b) Pathogen ; c) Degrees of infection