

**Chattogram Veterinary and Animal Sciences University**  
**Faculty of Fisheries**  
**Department of Fisheries Resource Management**  
Master of Science in Fisheries Resource Management, January-June Semester Final  
Examination' 2022  
Course Code: **ECF-501**, Course Title: Ecology of Fishes  
Total Marks: 40, Time: 2 hours

Answer any **FOUR** questions. Illustrate your answer wherever necessary. Figure in the right margin indicates full marks.

1. (a) Enlist components of aquatic ecosystem. 2.0  
(b) How food energy assimilated by a fish? 3.0  
(c) Briefly describe about the Brett energy budget equation with appropriate example. 5.0
2. (a) "Hearing is well-developed in carps"- Justify this statement. 2.0  
(b) How fishes try to avoid predators? 3.0  
(c) Write down the ontogenic changes of fish in nutrient transport. 5.0
3. (a) Differentiate between oviparity and viviparity. 2.0  
(b) Briefly describe the factors which trigger the spawning. 4.0  
(c) How photoperiod and periodicity influence reproductive cycle of fish? 4.0
4. (a) Define hibernation. Point out the risk of hibernation. 3.0  
(b) Illustrate life cycle of hilsa shad. 4.0  
(c) What do the fish do in the winter? 3.0
5. (a) Relate between ecology and evolution. 3.0  
(b) Write down the mechanisms of evolutionary changes of a fish population. 4.0  
(c) Briefly describe the effects of evolutionary changes. 3.0
6. (a) "Life history data is a management tool"- Explain. 2.0  
(b) How match-mismatch hypothesis integrated with life history strategies. 5.0  
(c) Classify fish species based on degree of movement. 3.0

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Course Code: **ASM-501**, Course Title: **Aquatic Soil Management**  
Total Marks: 40, Time: 2 hours

Answer any **FOUR** questions. Illustrate your answer wherever necessary. Figure in the right margin indicates full marks.

1. (a) Define Soil Science. 2.0  
(b) "The biological properties of soil are an integral part in maintaining balanced aquatic ecosystem"- Justify 3.0  
(c) Discuss the suitability of different soils for aquaculture and fisheries management. 5.0
2. (a) Why are upper most layers in a soil profile considered as most productive? 2.0  
(b) Differentiate between oxic and anoxic conditions with examples. 2.0  
(c) How alteration of soil pH in a negative trend can affect the development of coastal aquaculture in Bangladesh? 6.0
3. (a) Write down the importance of studying bottom mud in aquaculture and fisheries. 4.0  
(b) What are the challenges of open water sediment management and how can you overcome those? 6.0
4. (a) "The knowledge of 'bulk density' of a soil is more useful than that of 'particle density' in facing practical needs."—Explain. 3.0  
(b) Enumerate the significance of soil-water interaction. 3.0  
(c) How porosity depends on its density of a soil? 4.0
5. (a) Write down the advantages and disadvantages of sandy soils. 4.0  
(b) Develop an aquaculture model on very sandy soils. 6.0
6. (a) 'All productive soils are fertile but all fertile soils are not productive'- explain. 2.0  
(b) Compare and contrast how irrigation under arid and humid climates can influence soil salinity and sodicity 6.0  
(c) Why extremely acidic and alkaline conditions are undesirable in soils? 2.0

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Course Code: **AEC-501**, Course Title: Aquatic Ecology  
Total Marks: 40, Time: 2 hours

Answer any **FOUR** questions. Illustrate your answer wherever necessary. Figure in the right margin indicates full marks.

1. (a) Differentiate between habitat and ecological niche. 2.0  
(b) Write down the role of consumers in nutrient cycling and nutrient limitation. 3.0  
(c) Illustrate the nutrient exchange process in an aquatic ecosystem. 5.0
2. (a) Define stability of an ecosystem. Enlist the components of it. 3.0  
(b) "Ecosystem stability is an important presumption for sustainability of an ecosystem" – justify it. 3.0  
(c) Briefly discuss about the factors responsible for stability of an aquatic ecosystem. 4.0
3. (a) Define ecological ages of population. 2.0  
(b) Why is it necessary to know the ratio of various age groups in the population? 4.0  
(c) Compare and contrast among three types of population dispersion. 4.0
4. (a) "N<sub>2</sub> or P is known as limiting nutrient"-Explain this statement. 2.0  
(b) Describe the adaptation mechanism of organism in lotic habitat. 5.0  
(c) Classify freshwater organism based on their life form with example. 3.0
5. (a) Compare Lake Fishery and Floodplain Fishery. 4.0  
(b) Design and describe an energy flow model of floodplain ecosystem. 6.0
6. (a) "Estuaries are considered as a high productive ecosystem"- Explain this statement. 2.0  
(b) Why are salt marshes important to the environment? 3.0  
(c) Describe the method suitable for conducting a limnological research in Kaptai Lake. 5.0

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Course Code: **ALM-501**, Course Title: **Advanced Limnology**  
Total Marks: 40, Time: 2 hours

Answer any **FOUR** questions. Illustrate your answer wherever necessary. Figure in the right margin indicates full marks.

1. (a) "Limnological knowledge is prerequisite for successful aquaculture"- 4.0  
Justify.
- (b) How do limnological factors of flood plains affect fisheries productivity of the flood plain? 6.0
2. (a) Why is sun called "motor" of the water cycle? 2.0
- (b) How do anthropogenic activities affect the biogeochemical cycles? 3.0
- (c) Illustrate Phosphorus cycle in an aquatic ecosystem. 5.0
3. (a) "Periphyton serves as an indicator of water quality"- explain. 2.0
- (b) Write down the role of Periphyton in aquaculture ponds. 4.0
- (c) Compare and contrast between Periphyton and benthos. 4.0
4. (a) Write down the significant role of zooplankton in fisheries. 2.0
- (b) How do you enhance the production of zooplankton in fish ponds? 3.0
- (c) Describe the mechanism of human population affected by consumption of contaminated seafoods. 5.0
5. (a) Why is eutrophication undesirable in fish ponds? 2.0
- (b) Describe the effects of eutrophication in waterbody. 4.0
- (c) Write down the preventive and control measures of eutrophication. 4.0
6. (a) Define secondary production and which organisms are responsible for it? 4.0
- (b) Discuss the factors responsible for fluctuations of secondary production 6.0

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Master of Science in Fisheries Resource Management, January-June Semester Final Examination'  
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Course Code: **RCD-501**, Course Title: Research Methods, Concept and Design

Total Marks: 40, Time: 2 hours

Answer any **FOUR** questions. Illustrate your answer wherever necessary. Figure in the right margin indicates full marks.

1. (a) List down the characteristics of research 2.0  
(b) Illustrate the research process in a general way. 5.0  
(c) "Each of your research objectives should be SMART"-Explain this statement. 3.0
2. (a) "Previous knowledge can be highly beneficial in obtaining improved decision making in future"- Explain this statement in the discussion of scopes of a scientific research. 3.0  
(b) Differentiate between 'conceptualization' and 'formulation' step. 2.0  
(c) Discuss the benefits of "specification of universe of interest" in designing a research with examples. 5.0
3. (a) Define experiment. 3.0  
(b) Describe briefly an experiment for example to be set in a laboratory of FoF, CVASU. 7.0
4. (a) Mention some basic properties of standard normal curve. 2.0  
(b) State Chebychev's rule. What does Chebychev's rule say about the percentage of data that lies within 2 standard deviations of a data set. 4.0  
(c) How will you choose research hypothesis in fisheries research? 4.0
5. (a) Mention some advantages of early consultation with stakeholder. 3.0  
(b) How can you distinguish 'key learning' from the obtained result of a participatory studies. 3.0  
(c) Discuss the significance of 'key learning' in the development of a nation like Bangladesh. 4.0
6. (a) Why data interpretation is important? 2.0  
(b) How will you relate discussion with the result section of a scientific article? 5.0  
(c) Give an example of ideal abstract mentioning the elements. 3.0

**Department of Fisheries Resource Management**

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Course Code: FSA-501, Course Title: Fish Stock Assessment

Total Marks: 40, Time: 2 hours

Answer any FOUR questions. Illustrate your answer wherever necessary. Figure in the right margin indicates full marks.

1. (a) Mention the advantages of length measurement of marine species. 2.0
- (b) What does the correlation coefficient and coefficient of determination express about two variables in linear relationship? 2.0
- (c) Define selectivity of fishing gear. Illustrate graphically mesh selectivity curves for trawl nets for both smaller and larger mesh sizes. 6.0
  
2. (a) Define unit stock. Mention at least two cases where fish individuals living a particular geographical area exist as only one stock. 4.0
- (b) The numbers of sea cucumber of seven quadrates sampled from a habitat of 16500 m<sup>2</sup> area were 5, 11, 7, 16, 8, 10 and 3. All the quadrates area is equal size of 100 m<sup>2</sup>. Calculate the absolute abundance of population with 95% confidence level. [t=2.45] 6.0
  
3. (a) Differentiate between fishing mortality and natural mortality. 2.0
- (b) How do you obtain equation to estimate mortality rate algebraically in age based catch curve? 5.0
- (c) Why are the initial data points not included in regression line in age based catch curve? 3.0
  
4. (a) Define condition factor? Mention its use. 4.0
- (b) An experiment involving covering the codend of a trawl net with a cover made of smaller mesh netting produced the following small sample. Make an initial estimate of the mean length at first capture (Lc). 6.0

Length (cm)	Frequency (Cover)	Frequency (Codend)
10	2	0
11	24	3
12	27	8
13	26	11
14	35	26
15	22	47
16	12	72
17	5	67
18	0	48

5. (a) A measure of CPUE is a poor index of stock abundance - explain. 4.0
- (b) Describe the advantages of fishery-dependent data over fishery-independent data. 4.0
- (c) Why does the uniform type of spacing of individuals rarely occur in nature? 2.0
  
6. (a) Enlist the procedures for estimating parameters of Von Bertalanffy growth curve. 2.0
- (b) How does fish used the dietary energy? Enlist 5 hard parts of fish. 3.0
- (c) 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<sub>∞</sub>. Assume t<sub>0</sub>=0. 5.0

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