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 2024
Course Code: **ASM-501,** Course Title: **Aquatic Soil Management**
Total Marks: 40, Time: 2 hours

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

1.	(a)	Which type of soil is suitable for aquaculture and why?	02
	(b)	"Soil formation process is affected by several factors'' How?	04
	(c)	Elaborate on the management techniques of clay soil.	04
2.	(a)	Mention the characteristics of sandy soil.	02
	(b)	Differentiate between clay and silty soil.	03
	(c)	Mention the problems of clay soil in constructing a fish pond. How the "use of organic matter" can be beneficial to solve this problem?	05
3.	(a)	Why maintaining optimum soil pH is important for aquaculture?	02
	(b)	Describe the biological properties of soil.	04
	(c)	Explain the cation and anion exchange process between plant roots and soil.	04
4.	(a)	How do probiotics improve soil quality?	02
	(b)	Why bottom mud is called store storehouse of nutrients? – Explain.	04
	(b)	Describe the physio-chemical factors that control the release and retention of the nutrients from the bottom mud.	04
5.	(a)	Differentiate between productivity and fertility of the soil with examples.	02
	(b)	How do you maintain the appropriate fertility of soil?	03
	(c)	Elaborate the effective strategies for managing the bottom mud of an aquaculture pond to ensure sustainable aquaculture practices.	05
6.	(a)	Write the management techniques of Acid Subplate Soils.	05
	(b)	Discuss liming and fertilization as soil management tools.	05

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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)	Write down the components of aquatic ecosystem.	4
	(b)	Briefly describe the different types of interrelationships among fishes and other biota in ecosystems with example.	6
2.	(a)	"Hearing is well-developed in carps"- Justify this statement.	4
	(b)	Briefly describe the mechanism of predator avoidance of fish.	6
3.	(a)	Write down the modes of reproduction in fish.	4
	(b)	Illustrate the effects of climate change on reproductive cycle of fish.	6
4.	(a)	Differentiate between hibernation and aestivation.	3
	(b)	Why migration is needed for fish biology?	3
	(c)	Briefly describe the migratory ecology of hilsa shad.	4
5.	(a)	Discuss the mechanisms of evolutionary changes of a fish population.	5
	(b)	Write a short note on impacts of evolution on ecosystem.	5
6.	(a)	"Life history data is a management tool"-Explained it on your point of view.	4
	(b)	Describe the effects of climate on requirement of fish based on Match-mismatch hypothesis.	6

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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. The figure in the right margin indicates full marks.

1.	(a)	"Research generates new concepts, methods, and processes." - Justify this statement.	03
	(b)	Differentiate between research aims and objectives.	03
	(c)	How do you formulate objectives for your research? - Explain with an example.	04
2.	(a)	Enlist the disadvantages of quantitative research.	02
	(b)	Why research questions are important for scientific research?	03
	(c)	Discuss different steps of a research with proper diagram.	05
3.	(a)	"Sometimes qualitative research misinterprets the facts of original problems."- How?	04
	(b)	How you will design a laboratory experiment for fisheries research? Illustrate with an example.	06
4.	(a)	How you will identify a normally distributed population?	02
	(b)	Differentiate between null and alternative hypotheses with examples.	04
	(c)	Why data analysis is considered as a crucial step for scientific research?	04
5.	(a)	How do you collect secondary data for your research? Mention its sources.	03
	(b)	Differentiate between treatment and replication.	02
	(c)	Discuss the level of stakeholder participation in participatory studies.	05
6.	(a)	Develop a sample structure of the scientific report.	06
	(b)	Discuss the proper usage of tense in scientific article writing with examples.	04

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Master of Science in Fisheries Resource Management, January-June Semester Final Examination' 2024

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) Define fish stock assessment. 2
   (b) Why do we conduct fish stock assessments? 3
   (c) "Stock assessments provide scientific advice for sound fisheries management"- Explain. 5

2. (a) Define unit sock. Mention at least two cases that fish species individuals exist as unit stocks. 2+2 =4
   (b) Why does a fish population size fluctuate? 2
   (c) Name the various types of spacing for individuals within a unit stock. Write down the advantages of the common type of spacing for individuals within a unit stock. 2+2 =4

3. (a) Differentiate between fishing mortality and natural mortality. 3
   (b) Illustrate the reason for fish death during planktonic larval stage. 4
   (c) A cohort of 100 individuals belong to a fish stock suffers a constant mortality of 20% per year. Calculate the % mortality of that cohort at the end of 3 years. 3

4. (a) Write down the importance of weight measurement for fisheries work. 3
   (b) What does the correlation coefficient and coefficient of determination express about two variables in linear relationship? 4
   (c) Derive the straight-line equation from the length-weight relationship. 3

5. (a) "Poor relationships exist between spawning stock and recruitment strength"- Justify. 4
   (b) Discuss stock recruitment relationship of Shephered model when b values are 1, <1 and >1. 6

6. (a) Graphically represent the difficulties of single sample method. 4
   (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 $t_0=0$. 6

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

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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)	"Pond is an ideal ecosystem"- explain this statement.	3
	(b)	List the structural components of an ecosystem.	3
	(c)	Sketch zonation of a freshwater ecosystem.	4
2.	(a)	"Ecosystem stability is an important presumption for sustainability of an ecosystem" – Justify it.	4
	(b)	Briefly discuss about the factors responsible for stability of an aquatic ecosystem.	6
3.	(a)	Differentiate between dispersal and dispersion of a fish population.	4
	(b)	Illustrate patterns of population dispersion. Give reasons behind such distribution pattern in each case.	6
4.	(a)	How can you explain limits of tolerance of a species in respect to any limiting factor?	5
	(b)	Describe the adaptation mechanism of organism in lotic habitat.	5
5.	(a)	Design and describe an energy flow model of floodplain ecosystem.	6
	(b)	Write down some recommendation for floodplain modifications.	4
6.	(a)	Write down the basic communities of estuaries.	5
	(b)	Describe the method suitable for conducting a limnological research in Kaptai Lake.	5

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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)	Relate between water quality parameters and fish production.	5
	(b)	How does soil-water interaction affect the properties of a waterbody?	5
2.	(a)	Write down the role of consumers in nutrient cycling in inland waters.	4
	(b)	Illustrate phosphorus cycle in an aquatic system.	6
3.	(a)	"Limnological knowledge is essential for the sustainable management of the Kaptai lake" -Explain	5
	(b)	Write down the contribution of Kaptai lake in the national economy of Bangladesh.	5
4.	(a)	Why primary and secondary production are interdependent?	4
	(b)	Differentiate between variation of productivity in lentic and lotic habitats.	6
5.	(a)	Define benthos. Enlist the major groups of benthos.	4
	(b)	Write down the role of periphyton and benthos in aquaculture ponds.	6
6.	(a)	Why do zooplankton perform diel vertical migration?	4
	(b)	Relate between Diel Vertical Migration (DVM) and zooplankton abundance?	6