Chittagong Veterinary and Animal Sciences University, Chittagong

Faculty of Fisheries

Department of Fisheries Resource Management

Master of Science in Fisheries Resource Management, January-June Semester Final Examination' 2019

Course No: **ASM-501 (Elective)**, 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)	Point out the major anarchies in soil based aquaculture techniques in Bangladesh.	**3.0**
	b)	Prepare an exquisite planning of using non-fertile soil resources for aquaculture.	**7.0**
2.	a)	Why probiotics are called protagonists in aquatic ecosystem?	**3.0**
	b)	Provide a detail on probiotic administration with possible shortcomings in aquatic environment.	**7.0**
3.	a)	What is toxicity bioassay?	**3.0**
	b)	Draw a detail outline of chemical reactions in acid-sulphate soils (ASS).	**7.0**
4.	a)	How different soil texture is related to geography of a region?	**3.0**
	b)	Illustrate an appropriate model of aquaculture in clay soils after possible modification.	**7.0**
5.	a)	How lime requirement of a soil is related to its Cation Exchange Capacity (CEC)?	**3.0**
	b)	Discuss and exemplify the mathematical models of CEC determination.	**7.0**
6.	a)	Characterize the salient features of beneficial soil microbes.	**3.0**
	b)	Discuss the role of bottom mud as a keystone component in regulating nutrient balance in aquatic environment.	**7.0**

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Master of Science in Fisheries Resource Management, January-June Semester Final Examination' 2019

Course No: **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)	How food energy assimilated by a fish?	2.0
	(b)	Differentiate between lentic and lotic ecosystems.	3.0
	(c)	Briefly describe about the Winberg energy budget equation.	5.0
2.	(a)	Distinguish between inter and intra specific relationship pattern of fish.	4.0
	(b)	Briefly describe the different types of interrelationships among fishes and other biota in ecosystems with example.	6.0
3.	(a)	"Hearing is well-developed in carps"- Justify this statement.	2.0
	(b)	How a fish sensory system helps to detect predators?	3.0
	(c)	Briefly describe about the factors influencing the habitat shifting due to onthogenic changes.	5.0
4.	(a)	Define reproductive ecology.	2.0
	(b)	Discuss the modes of reproduction.	4.0
	(c)	Briefly describe the factors which trigger the spawning.	4.0
5.	(a)	Differentiate between hibernation and aestivation.	3.0
	(b)	How do koi fish live in the winter?	2.0
	(c)	Draw a schematic diagram of life cycle of hilsa shad.	5.0
6.	(a)	How ecology is related to evolution?	2.0
	(b)	Write down the mechanisms of evolutionary changes.	3.0
	(c)	Briefly describe the effects of evolutionary changes on aquatic ecosystem.	5.0

Chittagong Veterinary and Animal Sciences University
M.S. in Fisheries Resources Management,
Course No. ALM 501 (T), Course Title: Advanced Limnology (Theory)
January-June Semester Final Examination 2019
Total Marks: 40, Time: 2 hours

Answer any four (4) of the following questions.

1.	a.	"Knowledge of limnology is essential for successful aquaculture" - why?	2
	b.	Describe the role of periphyton in aquatic production.	2
	c.	Classify benthos based on size and location.	6
2.	a.	Define primary production. Why is it essential for life?	2
	b.	What are the reasons behind phytoplankton bloom?	2
	c.	How can you estimate primary production?	6
3.	a.	Discuss the key properties of soil.	2
	b.	How does the process of soil-water interaction work?	2
	c.	Explain how water quality is influenced by soil-water interaction.	6
4.	a.	Define biogeochemical cycle.	2
	b.	What is the role of bacteria in nutrient cycling?	2
	c.	Discuss Nitrogen cycle.	6
5.	a.	Why Cyanophyta is called a notorious group of phytoplankton?	2
	b.	What are the causes for migration of zooplankton?	2
	c.	Discuss phytoplankton-zooplankton relationship.	6
6.	a.	Write a short note on seasonal succession of phytoplankton.	2
	b.	How does eutrophication affect the fish community of a waterbody?	2
	c.	What are the common patterns of cyclomorphosis in different groups of zooplankton?	6

Chittagong Veterinary and Animal Sciences University
M.S. in Fisheries Resources Management,
Course No. FSA 501 (T), Course Title: Fish Stock Assessment (Theory)
January-June Semester Final Examination 2019
Total Marks: 40, Time: 2 hours

Answer any four (4) of the following questions.

1. a. Define fish population and unit stock. 2
   b. Explain CPUE as an index of relative abundance. 2
   c. A depletion experiment on an isolated Bahamian patch reef having a size of 125 m^2 was run over 4 days. The number of reef eels *Kaupichthyshyoproroides* caught and the number of efforts used per hour are shown in the following table. 6

Period (day)	Effort (hour)	Catch (No. of fish)
1st	1	5
2nd	1	4
3rd	1	3
4th	2	1

Estimate the catchability coefficient and the initial exploitable stock size using data of the above table.

2. a. Why length measurements are important in fisheries works? 2
   b. Define asymptotic length. 2
   c. Derive vonBertalanffygrowth equation to estimate growth coefficient and asymptotic length of fish. 6

3. a. What are the advantages of fast-growing species? 2
   b. Discuss stock-recruitment relationship. 8

4. a. Discuss the factors that reduces the chance of survival of individuals in a fish stock. 2
   b. What is catch curve? 2
   c. Derive Beverton and Holt equation to estimate mortality of a fish population. 6

5. a. What are the factors that allow an increased harvestable surplus in an exploitable stock? 2
   b. Elaborate the concept of MSY in surplus yield models with necessary figures. 8

6. a. What are the stimuli for gonadal development? 1
   b. Discuss various stock assessment tools. How can you select the best one? 8

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Course No: **RCD-501 (Compulsory)**, 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)	What is standard error? Give a proper interpretation of it with example.	**2.0**
	b)	Differentiate primary and secondary publication.	**3.0**
	c)	What are the weakness of participatory methods? How can you overcome those?	**5.0**
2.	a)	What do you understand regarding 'statistical tools'?	**2.0**
	b)	Write down the implication of general empirical rule in two-tailed hypothesis testing.	**3.0**
	c)	Obtain the appropriate ways of choosing hypothesis for a fisheries research.	**5.0**
3.	a)	What are the pre-requisites of selection of a research title?	**2.0**
	b)	How do you discuss your obtained research results?	**3.0**
	c)	Write in details about the peer reviewing process of a scientific article.	**5.0**
4.	a)	What is Z_α notation? - Explain with illustration.	**2.0**
	b)	How will you formulate your conceptualized research model?	**3.0**
	c)	Discuss an imaginary case study of a controlled experiment set at Aquatic Ecology Laboratory in CVASU.	**5.0**
5.	a)	What are the fundamental parts of a research proposal?	**2.0**
	b)	How will you select objectives for your research?	**3.0**
	c)	Describe the appropriate ways of writing references for your MS thesis paper.	**5.0**
6.	a)	Why reconnaissance survey is important in socio-economic assessment?	**2.0**
	b)	Why conducting 'census' is impractical in research process?	**3.0**
	c)	Obtain a large sample confidence interval in estimating a population mean algebraically.	**5.0**

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Master of Science in Fisheries Resource Management, January-June Semester Final Examination' 2019
Course No: **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)	Illustrate the level of integration found in ecology.	2.0
	(b)	A fisheries survey was carried out in the Halda River of Chittagong hill tracts in order to estimate biodiversity status. Which method is useful for conducting this study and briefly describe this method.	5.0
	(c)	Write down the scope of ecology.	3.0
2.	(a)	Define ecological pyramid. Mention its types.	2.0
	(b)	Where does the energy come from in a food chain?	2.0
	(c)	Write down the role of consumers in nutrient cycling and nutrient limitation.	6.0
3.	(a)	Differentiate between primary and secondary succession.	2.0
	(b)	Climax concept considered as the end point of succession- Justify this statement	2.0
	(c)	Briefly discuss about the mechanism of succession.	6.0
4.	(a)	Why ecological density is more preferred to crude density in ecological study?	2.0
	(b)	Compare and contrast exponential and logistic growth curve.	5.0
	(c)	What are the ecological ages of population? Why it is necessary to know the ratio of various age groups in the population?	3.0
5.	(a)	How are limiting factors related to population density?	3.0
	(b)	N or P is the limiting nutrient- Explain this statement.	2.0
	(c)	Write down the ecological classification of lakes.	5.0
6.	(a)	Compare Lake Fishery and Floodplain River Fishery.	3.0
	(b)	Briefly describe about the energy flow of floodplain with an appropriate example.	5.0
	(c)	Why are floodplains important to aquatic ecosystem function?	2.0