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 2017
Total Marks: 40, Time: 2 hour

Answer any four (4) of the following questions.

1.	a.	What do you mean by soil-water interaction? Enlist some processes of it.	2
	b.	Discuss the effects of soil-water interaction on productivity.	6
	c.	How do water quality parameters and productivity vary according to different soil types?	2
2.	a.	"Bacteria is an essential component of biogeochemical cycle"- why? Define following terminologies with examples **i)** Limiting factors and **ii)** Trace elements.	2
	b.	Discuss the theories which explain phytoplankton-zooplankton relationship.	6
	c.	Write down the names of phytoplankton groups containing noxious algae. What are the probable ecological impacts caused by eutrophication?	2
3.	a.	Define seasonal succession in phytoplankton. Briefly describe the factors responsible for it?	2
	b.	Write an essay on causes and effects of phytoplankton bloom.	6
	c.	How is human population affected by consumption of contaminated seafoods?	2
4.	a.	What is meant by cyclomorphosis in zooplankton? What are the reasons behind this phenomenon?	2
	b.	Discuss cyclomorphosis in zooplankton at length.	6
	c.	Write a short note on Calcium cycle in an aquatic ecosystem.	2
5.	a.	What do you mean by soil function?	2
	b.	Discuss nitrogen cycle in details.	6
	c.	What are the functions of phosphorus?	2
6.	a.	What are the mechanisms of eutrophication?	2
	b.	Explain carbon cycle.	6
	c.	How eutrophication can be prevented?	2

Chittagong Veterinary and Animal Sciences University
M.S. in Fisheries Resources Management,
Course No. FSA 501 (T), Course Title: Fish Stock Asssessment (Theory)
January-June Semester Final Examination 2017
Total Marks: 40, Time: 2 hour

Answer any four (4) of the following questions.

1. a. What is the necessary condition to be fulfilled in running depletion experiments? 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 *Kaupichthys hyoproroides* caught and the number of effort used per hour are shown in the following table.

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

   i. Estimate the catchability coefficient and the initial exploitable stock size using data of the above table. 6

   ii. If a survey of an adjacent larger stock of 500 m^2 resulted in CPUE of 5 fish per effort, use the catchability coefficient obtained in the above depletion experiment to estimate the size of eel stock in this larger area. 2

2. a. Derive the equations of Ford-Walford plot for growth estimation. 4

   b. Analyze the mean lengths at ages of ribbon fish stock in Kagoshima Bay, Japan given in the following table to estimate growth parameters K and $L\alpha$. 6

Age (year)	I	II	III	IV	V	VI
Length (mm)	234	295	346	390	427	458

3. a. Define unit stock with an example. 2

   b. Mention the advantage of measuring length over weight of marine species. Why is weight measurement required for fisheries work? 2

   c. The numbers of sea cucumbers of seven quadrates sampled from a habitat of 15600 m^2 area were 4,15,9,6,7,13 and 5. All the quadrates are of equal size of 100 m^2. Calculate the absolute abundance of the population with 95% confidence level. Use t = 2.45. 6

4. a. Estimate the relationship between the standard length and body weight of Chapila (*Gudusia chapra*) obtained from a random sampling of 10 (ten) individuals using the following data. Comment on its growth pattern. Use t = 2.31. 10

SL(mm)	BW(g)
50	1.57
49	1.34
49	1.54
53	2.05
55	1.96
55	1.84
48	1.40
54	2.25
55	2.07
48	1.39

5. a. Define MSY and MEY. 2

b. Elaborate the yeild per recruit model algebraically. 6

c. Show algebraically the maximum sustainable yeild occurs when biomass is one-half its unexploited level. 2

6. a. Define Length at sexual maturity (L_m). 1

b. Derive the straight line equation from length-weight relationship. Describe factors reducing the chance of survival of individuals in a fish population. Why do marine species face a high mortality during planktonic larval stage? 3

c. Langerman (1980) conducted marking and tagging experiments on tigerfish *Hydrocynus vittatus* in Lake Kariba. In that experiment, 984 fish were tagged and released. Upon fishing one day later with a chartered vessel, 3253 fish were caught, 68 of which bore tags. 6

Make an estimate of absolute abundance of tigerfish in Lake Kariba. Determine the stock size with 95% confidence limits. Use t = 1.96.

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' 2017

Course No: **AEC-501 (Compulsory)**, Course Title: Aquatic Ecology

Total Marks: 40, Time: 2 hours

Answer any **FOUR** questions. Illustrate your answer wherever necessary.

1	a)	Define ecology. Write down the scope of ecology.	2.5
	b)	Briefly describe about the history of ecology.	2.5
	c)	Briefly describe the levels of integration found in ecology.	05
2.	a)	What is decomposition?	02
	b)	Why green plants are called producers in an ecosystem?	02
	c)	Differentiate between habitat and ecological niche.	03
	d)	Enumerate the role of consumers in nutrient cycling and nutrient limitation.	03
3	a)	Define population ecology.	02
	b)	Enlist the properties of population.	01
	c)	Explain population density. How to calculate population density?	02
	d)	Compare and contrast exponential and logistic growth curve.	05
4	a)	Write down some important characteristics of floodplains.	02
	b)	Explain in details about the ecological significance of floodplains.	02
	c)	Briefly describe about the energy flow of floodplain with an appropriate example.	03
	d)	State the modification of floodplain ecosystem.	03
5	a)	Illustrate general views of estuary.	02
	b)	Classify estuary based on geomorphology with example.	03
	c)	Estuaries are considered as a high productive ecosystem. Explain this statement.	03
	d)	Differentiate between marsh and swamp.	02
6	a)	Classify freshwater organism based on their position on the food chain with example.	03
	b)	How organisms are adapted in lotic habitat?	02
	c)	How are limiting factors related to population density?	02
	d)	Briefly describe about law of tolerance with example.	03

Chittagong Veterinary and Animal Sciences University, Chittagong

Faculty of Fisheries

Department of Fisheries Resources Management

Master of Science in Fisheries Resource Management, January-June Semester Final Examination' 2017

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)	How physico-chemical properties of soil interlinked with each other?	**4.0**
	b)	Write down the role of soil-based aquaculture in the economy of Bangladesh.	**6.0**
2.	a)	Develop a classification of salt-affected soils based on different laboratory analysis process.	**4.0**
	b)	How do you reclaim it for successful aquaculture?	**6.0**
3.	a)	Why visual evaluation of soil is necessary?	**2.0**
	b)	How lime requirement depends on soil pH?	**3.0**
	c)	Prepare a flow chart of organic carbon estimation with equation.	**5.0**
4.	a)	Why acid-sulphate soil is concentrated mainly in the coastal basins?	**2.0**
	b)	Show the chemical interaction & processes involved in the development of acid-sulphate soils.	**6.0**
	c)	Why aquaculture is not suitable in sandy soils?	**2.0**
5.	a)	Elaborate your understandings regarding nutrient exchange between soil and water.	**5.0**
	b)	How bottom mud can be efficiently managed in aquaculture?	**5.0**
6.	a)	How do oxidized layer develop in soils?	**3.0**
	b)	Illustrate an appropriate model of aquaculture in clay soils after possible modification.	**7.0**

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' 2017

Course No: **ECF-501 (Compulsory)**, Course Title: Ecology of Fishes

Total Marks: 40, Time: 2 hours

Answer any **FOUR** questions. Illustrate your answer wherever necessary.

1	a)	What do you know about inter specific relationships of fish.	02
	b)	Distinguish between inter and intra specific relationship pattern of fish.	03
	c)	Briefly describe the different types of interrelationships among fishes and other biota in ecosystems with example.	05
2	a)	How fish sensory system helps to detect predators?	03
	b)	Differentiate among oviparity, ovoviviparity and viviparity.	03
	c)	Briefly describe the factors which trigger the spawning.	02
	d)	Define the terms: Fish Ontogeny, Egg stage, Flexion stage, Transitional stage.	02
3	a)	Define migration and migration ecology.	02
	b)	Write down the importance of migration for fish biology.	03
	c)	Briefly describe the migratory ecology of hilsa shad.	05
4	a)	What is hibernation? Write down the risk of hibernation.	02
	b)	How do koi fish live in the winter?	02
	c)	Distinguish between hibernation and aestivation.	02
	d)	Elaborately discuss about the life cycle of freshwater eel with figure.	04
5	a)	What is match-mismatch hypothesis?	02
	b)	How match-mismatch hypothesis integrated with life history strategies?	02
	c)	Life history data is a management tool. Explained it on your point of view.	03
	d)	Why r and k selection is needed for life history pattern?	03
6	a)	Explain evolutionary ecology.	02
	b)	Write down the mechanisms of evolutionary changes.	03
	c)	Briefly describe the effects of evolutionary changes.	05

Chittagong Veterinary and Animal Sciences University, Chittagong

Faculty of Fisheries

Department of Fisheries Resources Management

Master of Science in Fisheries Resource Management, January-June Semester Final Examination' 2017

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)	How do you formulate objectives in a fisheries research?	**2.0**
	b)	Which one is more important in a research process between 'execution' and 'planning'? – Explain.	**3.0**
	c)	Write down the scopes of field research in Chittagong region of Bangladesh.	**5.0**
2.	a)	How many samples are suitable for an authentic research? Explain with an example.	**2.0**
	b)	Why do you calculate 'standard error' while collecting samples for a research?	**2.0**
	c)	Give a detail outline on Student's t-test in the data analysis of a research.	**6.0**
3.	a)	How do you graphically represent your obtained results?	**3.0**
	b)	Provide a detail on appropriate reference write-up in a thesis.	**7.0**
4.	a)	Why reconnaissance survey is important in socio-economic assessment?	**3.0**
	b)	Why conducting 'census' is impractical in research process?	**2.0**
	c)	Obtain a large sample confidence interval that suits the parametric nature of a population.	**5.0**
5.	a)	What are the fundamental parts of a research proposal?	**3.0**
	b)	Mention the significance of 'Budgeting' in conducting a sophisticated research.	**4.0**
	c)	How can you orient your readers by a catchy and attractive title?	**3.0**
6.	a)	Compare the 'primary' and 'secondary' sources of data in a research process.	**3.0**
	b)	When do data analysis become successful?	**3.0**
	c)	How can you overcome the weakness in participation?	**4.0**