Chittagong Veterinary and Animal Sciences University, Chittagong

Department of Fish Biology and Biotechnology

MS in Fish Biology and Biotechnology; Jan- Jun Semester, Final Exam/18

Course No&Title.: RDA- 501 (T), Research Design and Genetic Data Analysis

Total Marks-40, Time: 2 hours

Answer **any five (05)** from the followings. Figure in the right margins indicates full marks. Split answers are not acceptable.

1. a) What is an experiment? Describe the basic principles of an experimental design. 3.0
   b) Explain Randomized complete block design with example. 5.0

2. a) What are the different types of data? Give examples of different types of data from the fisheries science. 4.0
   b) What do you mean by standard deviation and standard error? What are the importance of standard deviation and standard error in any research? 4.0

3. a) What do you know about ANOVA? Write the advantages of ANOVA. 2.0
   b) How will you compute one-way ANOVA? 6.0

4. a) What do you mean by phylogenetic tree? Mention the different methods of phylogenetic tree construction. 2.0
   b) Mention the general steps for phylogenetic tree construction. Explain the different parts of a phylogenetic tree. 3.0
   c) Write the advantages and disadvantages of distance and maximum parsimony method. 3.0

5. a) What do you mean by linkage disequilibrium? What are the reasons of linkage disequilibrium? 4.0
   b) Explain linkage disequilibrium with example. 4.0

6. a) What is Chi-Square test? How will you calculate Chi-Square (χ^2) statistic? 3.0
   b) The following numbers of the human A-B blood groups were recorded in a sample of American whites: AA= 1787, AB=3039, BB=1303, total=6129. 5.0
      i) What are the genotype and gene frequencies observed in this sample?
      ii) What is the genotype frequencies expected from the Hardy- Weinberg law?
      iii) How well do the observed frequencies agree with the expectation (t=3.841)?

7. a) What are the advantages and disadvantages of one way ANOVA? 1.0
   b) The following table shows the weight (g) of a fish species in four different situations (using four different feeding regimes, FR). Determine if the mean weight of the four groups significantly differs ($F_{3,36}$=2.88; at 5% level of significance). 7.0

Wt. (g) with FR1	Wt. (g) with FR2	Wt. (g) with FR3	Wt. (g) with FR4
130	122	134	108
127	128	129	112
124	125	133	113
126	127	132	111
130	133	133	116
131	125	136	108
125	126	127	109
136	120	128	110
122	129	132	114
123	119	135	112

Chittagong Veterinary and Animal Sciences University, Chittagong

Department of Fish Biology and Biotechnology

MS in Fish Biology and Biotechnology, Jan-Jun/Final Exam/2018

Course No.: FEN- **501 (T),** Course Title: **Fish Endocrinology**

Time: 2hr, Full Marks: 40

Answer **any five (05)** from the following. Figure in the right margins indicates full marks. Split answers are not acceptable.

1.	a.	What do you mean by endocrinology and endocrine system?	2.0
	b.	"Endocrinology has great scope in fisheries science."-Justify the statement.	2.0
	c.	Differentiate between endocrine and exocrine glands?	2.0
	d.	Show the position of different endocrine glands found in fishes.	2.0
2.	a.	Why do you think hormone is essential for every activity in life?	2.0
	b.	Write the secretions of adenohypophyseal lobe and their specific functions.	4.0
	c.	"Hormone is called the chemical messenger molecule in the body"- prove the statement.	2.0
3.	a.	"Androgen is a steriod hormone"- Justify your answer.	2.0
	b.	Construct a diagram showing the synthesis of steroid hormone in the body of organisms.	4.0
	c.	Negative feedback can control the secretion of excess amount of hormone- explain with diagram.	2.0
4.	a.	What do you mean by HPA and HPG axis in fish?	2.0
	b.	Describe how HPG-axis controls the reproduction in fish.	6.0
5.	a.	"A hormone can be a neurotransmitter"-Defend against your answer.	2.0
	b.	"Dopamine is both an inhibatory and excitatory neurotransmitter"- Discuss the statement	2.0
	c.	Summarize the neural regulation mechanisms by neurosecretory cells.	4.0
6.	a.	HPG axis controls the reproduction and development in an animal- How will you explain the statement?	3.0
	b.	Discuss the hormonal regulation of steroidogenesis and spermatogenesis in the testis.	5.0
7.	a.	What do you mean by vitellogenesis and oocyte maturation?	2.0
	b.	Integrate the maturation of oocyte and related hormonal control in a diagram.	4.0
	c.	How egg-yolk and egg-precursor protein is synthesized?	2.0

Chittagong Veterinary and Animal Sciences University, Chittagong

Department of Fish Biology and Biotechnology

MS in Fish Biology and Biotechnology, Jan-Jun Semester, Fianl Exam/2018

Course No.: AFP- **501 (T),** Course Title: **Advanced Fish Physiology**

Time: 2 hrs, Full Marks: 40

Answer **any five (05)** fromthe followings. Figure in the right margins indicates full marks. Split answers are not acceptable.

1.	a.	What do you mean by fish physiology and how does it differs from anatomy?	2.0
	b.	How will you apply physiological knowledge in fisheries.	3.0
	c.	What are the legal aspects you should consider while using anesthesia in fishes?	3.0
2.	a.	What do you understand by energy metabolism?	1.0
	b.	Describe any two of the energy metabolism measurement techniques.	5.0
	c.	What are the factors affecting metabolism in fish?	2.0
3.	a.	Write down the component of fish circulatory system with their functions.	3.0
	b.	Compare and contrast the circulatory mechanisms of fish and human.	5.0
4.	a.	Describe any four of the anesthesia with their chemical name, doses and precautions.	6.0
	b.	How will you apply anesthesia during brood fish trasportation?	2.0
5.	a.	"Fish production is being hampared due to stress"- justify the statement.	2.0
	b.	Make a list of different stressors causing stress to fish.	2.0
	c.	Diagrammatically show response to stress in fishes.	2.0
	d.	How will you minimize the stress in culture fisheries?	2.0
6.	a.	Define ration. How it is related to fish production?	2.0
	b.	Outline the different techniques for measuring growth in fishes.	4.0
	c.	Summarize the effects of temperature on the growth of fishes.	2.0
7.	a.	Explain how fish endocrine system response to stress.	4.0
	b.	Outline the hormonal changes during stress in aquatic animals.	4.0

Chittagong Veterinary and Animal Sciences University, Chittagong

Department of Fish Biology and Biotechnology

MS in Fish Biology and Biotechnology, Jan-Jun semester, Final Exam/2018

Course No.: BAA- **501 (T),** Course Title: **Biology of Aquatic Animals**

Time: 2hr, Full Marks: 40

Answer **any five (05)** fromthe following. Figure in the right margins indicates full marks.Splits answer is not acceptable.

1.	a.	What do you mean by biology of fish?	1.0
	b.	Justify the significance of studying biology of aquatic animals in context of Bangladesh.	4.0
	c.	'Breeding biology study is prior to artificial breeding.'-explain the statement with logic.	3.0
2.	a.	Characterize the breeding behavior of *Mugil cephalus*.	4.0
	b.	Prepare a comparative statement about the life history events in *Salmo salar* and *Anguilla bengalensis*.	4.0
3.	a.	What do you mean by hibernation and aestivation?	2.0
	b.	How you will differentiate between male and female frog?	2.0
	c.	Summarize the life cycle events of Dolphin.	4.0
4.	a.	What do you mean by spat, veliger, PL and zoea?	2.0
	b.	Explain the reproduction and larval developmental stages of giant tiger shrimp, *Penaeus monodon.*	4.0
	d.	Why culture of lobster is quite difficult in Bangladesh perspective?-Defend against your answer.	2.0
5.	a.	What do you mean by protandry, protogyny and hermaphrodism?	2.0
	b.	Briefly describe the pearl formation mechanisms in Oyster.	4.0
	c.	Assess the feasibility of mussel and oyster culture in Bangladesh.	2.0
6.	a.	What do you know about sexuality and migratory pattern of *Lates calcarifer.*	3.0
	b.	Describe the life cycle of *Lates calcarifer.*	5.0
7.	a.	What do you mean by migration and mention its types?	2.0
	b.	Identify the causes of fish migration?	2.0
	c.	Describe the migratory pattern of *Tenualosa ilisha*.	4.0

Chittagong Veterinary and Animal Sciences University, Chittagong
Department of Fish Biology and Biotechnology

MS in Fish Biology and Biotechnology; Jan- Jun Semester, Final Exam/18

Course No & Title.: **PCG- 501 (T), Fish Population and Conservation Genetics**

Total Marks-40, Time: 2 hours

Answer **any five (05)** from the following. Figure in the right margins indicates full marks. Split answers are not acceptable.

1. a) What do you mean by genetic management and conservation of fish population? 3.0

   b. How will you use molecular markers in genetic study and conservation of fish population? 5.0

2. a. What o you mean by Hardy Weinberg Equilibrium? What are the assumptions underlying HWE? 3.0

   b) Explain the HWE law with an example from fish. 5.0

2. a) What is genetic marker? Make a list of genetic marker widely used in fisheries research. 3.0

   b) Explain the production method of RAPD with examples. 5.0

3. a) Write down the theory of electrophoresis. 2.0

   b) Discuss the steps for protein separation with diagram. 6.0

4. a) Write the principle of microsatellite. 2.0

   b) Make a comparison between RFLP, RAPD and Microsatellite marker. 3.0

   c) Which marker is best for genetic study of fish? Explain why. 3.0

5. a) What is genetic drift? Mention the relationship with inbreeding number. 3.0

   b) Explain the effect of genetic drift with examples. 5.0

6. a) What do you mean by natural hybridization and gene introgression in fishes? 2.0

   b) What are the factors promoting natural hybridization in fishes? 2.0

   c) Explain the negative impacts of hybridization in fishes. 4.0

7. a) What do you mean by genetic distance? What are the bases of genetic distance? 2.0

   b) Explain the Nei's standard genetic distance method as a measure of genetic distance. 6.0

Chittagong Veterinary and Animal Sciences University, Chittagong
Department of Fish Biology and Biotechnology
MS in Fish Biology and Biotechnology; Jan- Jun Semester, Final Exam/18

Course No & Title.: FGE- 501 (T), Fish Genetic Engineering

Total Marks-40, Time: 2 hours

*Answer**any05(five)**question.Figures in the right margin indicate full mark.*

1.	a)	Discuss the prospects of genetic engineering in fisheries.	5.0
	b)	Explain fish as model animal for genetic engineering and biotechnology.	3.0
2.	a)	Write the basic steps of gene cloning.	2.0
	b)	How will you produce and screen cDNA library?	6.0
3.	a)	What do you mean by In-Situ Hybridization?	1.0
	b)	Write the principle of Fluorescence In Situ Hybridization (FISH).	3.0
	c)	What are the procedural steps of Genomic In Situ Hybridization (GISH)?	4.0
4.	a)	Describe the basic steps to produce recombinant DNA with figure.	5.0
	b)	How will you apply recombinant DNA technology to improve products?	3.0
5.	a)	What is transgenesis? Make a list of gene transfer techniques.	3.0
	b)	Explain any two of gene transfer techniques used in fisheries?	5.0
6.	a)	What is blotting? Mention different blotting techniques with their purpose.	2.0
	b)	Write the principle of Southern blotting. Write its applications.	4.0
	c)	Differentiate between Southern and Northern blotting technique.	2.0
7.	a)	Write do you mean by bioethics and biosafety?	2.0
	b)	Discuss bioethical and biosafety issues of biotechnological applications.	6.0

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**