Chattogram Veterinary and Animal Sciences University, Chattogram
Faculty of Fisheries
B. Sc. Fisheries (Hons.) Year-4, Semester-2, Final Examination' 2019
Course No: **FFT-402 (T)**, Course Title: **Fish Feed Technology (Theory)**
Total Marks: 70, Time: 3 hours

*Answer any **05 (five)** questions from each section. Figures in the right margin indicate full mark. Use separate answer script for each section.*

Section-A

1.	a)	Describe the different types of fish feed readily available in Bangladesh.	3
	b)	What are the factors need to be considered in selecting the potential feedstuff for feed formulation?	4
2.	a)	Write down the basic limitations for feed stuff selection.	4
	b)	How do you overcome the problems with EAA imbalance and toxic or anti-nutritional factors during feed formulation?	3
3.	a)	Classify the major groups of feed ingredients available in Bangladesh with five examples.	3
	b)	Summarize the selection criteria for feed ingredients to formulate aqua-feed.	4
4.	a)	Illustrate the different feeding habits of fish and give two examples for each feeding habit.	5
	b)	Explain the following terminology used in fish feed technology: Extruded feed; feed conversion ratio; feed efficiency ratio; semi-moist diet and non-specific immunostimulant.	2
5.	a)	Write down the objectives of feeding fish.	2
	b)	Discuss the different factors that affect the feed quality in storage condition.	5
6.	a)	Define the anti-nutritional factors in feed formulation and write down the major four groups of anti-nutrient of plant origin.	4
	b)	Write down the commonly available dietary protein ingredient sources for feed formulation.	3
7.		Write short notes on any 02 (two) of the following: a) Feeding rate; b) Aflatoxin and c) Compensatory feeding.	3.5 X 2 = 7

Section B

8.	a)	What are the characteristic of a quality feed?	2
	b)	Briefly discuss fish feed on the basis of moisture and life cycle stages of fish.	5
9.	a)	Define the pearson square method and explain how to apply this method.	3
	b)	Formulate a diet containing 36% crude protein (CP) for carp using squid meal : 78 % CP, fish silage: 55% CP, corn meal: 12% CP and wheat flour : 16% CP.	4
10.	a)	Define digestibility. Write down the factors affecting digestibility.	3
	b)	Differentiate between apparent and true nutrient digestibility.	4
11.	a)	Enlist the conventional and unconventional feedstuffs available for feed formulation in Bangladesh.	3
	b)	Distinguish between conventional and unconventional feedstuffs.	4
12.	a)	Define feeding frequency.	2
	b)	Schematically show and discuss the relationship between appetite and satiation.	5
13.	a)	Write down the importance of fish feed law and regulations.	2
	b)	Briefly discuss the international code of conducts for inclusion of feed ingredients in fish feed formulation.	5
14.	a)	Mention the deleterious substances available in sesame meal.	2
	b)	Classify the major feed ingredients from nutritional point of view and explain the nutritional sources of those ingredients.	5

Chattogram Veterinary and Animal Sciences University, Chattogram
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B. Sc. Fisheries (Hons.) Year -4 Semester-2, Final Examination' 2019
Course No: **FIL-402 (T)**, Course Title: **Fish Inspection and Legislation (Theory)**
Total Marks: 70, Time: 3 hours

*Answer any **5 (five)** questions from each section. Figures in the right margin indicate full mark. Use separate answer script for each section.*

Section-A

1.	a)	Explain briefly the importance of safety and quality in fishery products.	2
	b)	List down some major food borne disease associated after consumption of contaminated fish.	2
	c)	List down the intentionally or unintentionally added chemicals/veterinary drugs in fish/shrimp farms, hatchery and feeds.	3
2.	a)	"Traceability helps to uplift seafood business."- Do you agree with this statement?-Justify	3
	b)	Enlist the information that is necessary to record a farmer and depot owner to maintain traceability.	2
	c)	Explain the components of traceability system of shrimp value chain.	2
3.	a)	Write down the major inspection activities of FIQC in fish and shrimp processing plants.	1.5
	b)	What is factory own check system? What kind of testing are done in FIQC laboratory for analysis of microorganisms in fish and fishery products.	2.5
	c)	What kind of training programs are conducted for depot and factory personnel by the FIQC officials? Explain.	3
4.	a)	Briefly discuss problems focused by the fish processing industries of Bangladesh.	3
	b)	What is non-compliance? List down 8 key points of USFDA general sanitation conditions required for a fish processing establishment.	4
5.	a)	What types of fishery establishments in Bangladesh which needs listing/registration for official control? Explain.	3
	b)	What do you mean "Official Control of Fish and Fishery Products"? What kinds of documents are required for listing/ licensing and getting approval of a newly established fish processing establishment? Explain.	4
6.	a)	Mention the objectives of NRCP.	2
	b)	Write in brief the substance groups that are monitored under NRCP program.	2.5
	c)	What should be the sampling strategy according to policy guidelines for NRCP?	2.5
7.	a)	Mention the objectives of food law.	1
	b)	Briefly discuss main features of Fish Hatchery Act, 2010.	3
	c)	Write down the conditions of necessary facilities for fish landing center/ service center as outlined in FIQC rules in schedule 6.	3

Section B

8.	a)	Define EU Directives and Decisions.	1
	b)	Write in brief some legal regulatory national legislations in place in Bangladesh for official control of fishery products.	2
	c)	Differentiate between medium and low risk levels of non-compliance. Write in brief key points of GMP conditions of a fish processing industry.	4
9.	a)	List down some international legislations which were also being used in view of harmonization to meet the global requirements for producing safe fishery products in Bangladesh.	4
	b)	Write in brief regulation (EC) No 852/2004 Chapter II, Article 5.	3
10.	a)	State briefly the sampling plan and microbiological limit for fish and fish products (ICMSF-1986).	4
	b)	Prepare a checklist for inspection of fish/shrimp farms.	3
11.	a)	Who is an authorized officer for official control of fishery of fish and fishery products in the processing establishment as per FIQC rule 3? Explain.	3.5
	b)	Write in brief measures need to be taken as per FIQC rule-7after the return of consignments containing fish and fishery products which has been exported previously.	3.5

12. a) Pre export testing of fishery product is important- Justify. 3
    b) Write in brief sample collection process for the purpose of microbiological testing in fish and fishery products. 4

13. a) Enlist the name of 5 (five) naturally occurring bio toxins. 2
    b) Enlist the information required for a sampling report. 2
    c) Differentiate between food infection and intoxication with examples. 3

14. Write short notes on **any 2 (TWO)** on following: 3.5 X 2 = 7
    i) Hatchery act and rules; (ii) ISO 9000 and (iii) RASSF notification.

Chattogram Veterinary and Animal Sciences University, Chattogram
Faculty of Fisheries
B. Sc. Fisheries (Hons.) **Year -4 Semester-2**, Final Examination' 2019
Course No: **BHM-402 (T)**, Course Title: **Fish Breeding and Hatchery Management (Theory)**
Total Marks: 70, Time: 3 hours

*Answer any **05 (five)** questions from each section. Figures in the right margin indicate full mark. Use separate answer script for each section.*

Section-A

1. a) Define fish hatchery and hatchery management. 2
   b) Outline the brief history of induced spawning of fish. 5

2. a) Mention the important components of a carp hatchery. 2
   b) What types of incubators are used in fish hatcheries? Mention the special features, merits and demerits of circular incubator. 4
   c) What types of incubators are used for catfish breeding and why? 1

3. a) Explain the following terms: fertilization, embryo, larva and ovulation. 2
   b) Differentiate between induced spawning and artificial spawning. 2
   c) How will you control onset of fish spawning? 3

4. a) Justify the importance of induced spawning in context of aquaculture industry of Bangladesh. 3
   b) Explain how does gonadotropin control gonadal development and ovulation? 4

5. a) What is inbreeding? Mention the symptoms of inbreeding depression. 2
   b) What is effective breeding number (Ne)? How does Ne control the seed quality of Indian major carps in hatcheries? 3
   c) How will you control the inbreeding accumulation? 2

6. a) Define selection and mention its importance. 2
   b) "No selection is the best selection"- Explain the statement. 3
   c) Differentiate between 'within family selection' and 'between family selection'. 2

7 a) Mention the important technical issues of hatchery management. 2
   b) What is cost-benefit analysis? Explain it with an example. 4
   c) List down some water treatment methods in fish hatcheries? 1

Section B

8. a) Mention the major problems existing in fish hatchery of Bangladesh. Point out the remedial measures to mitigate these problems. 4
   b) Outline an ideal broodstock development protocol for artificial breeding in fish hatchery. 3

9. a) What is broodfish and left over fish? How will you identify ready to spawn male and female Indian major carps? 3
   b) Why management of broodstock nutrition and genetics are most important in fish hatchery? 4

10. a) What are the criteria should you consider during site selection of a fish hatchery? 2
    b) What is hybridization? Mention the different types of cross breeding program. 3
    c) Hybridization is not a good program for brood production-why. 2

11. a) What is conditioning? Why conditioning is important before live fish transportation? 2
    b) Explain any two live fish transportation systems extensively used in Bangladesh with their advantages and disadvantages. 5

12. a) What are the important aspects need to be considered during rearing of fish fry? 2
    b) Explain double stage fry rearing technique of carps including pond preparation. 5

13. a) Explain the factors affecting first feeding of fish larvae. 3
    b) Explain with example the influence of temperature on yolk-sac absorption and first feeding of fish larvae. 4

14. Write short notes ***any 02 (TWO)*** on following: 3.5 X 2 = 7
    i) Heterosis and hybrid vigor; (ii) Prospects of marine fish hatchery in Bangladesh and (iii) Hatchery originated water pollution and remedy.