

Chattogram Veterinary and Animal Sciences University, Chattogram
Faculty of Fisheries
B. Sc. Fisheries (Hons.), Year-03, Semester-02 (July-December), Final Examination' 2022
Course No. FIL-402(T), Course Title: Fish Inspection and Legislation (Theory)
Total Marks: 70, Time: 3 hours

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

Section-A

1. a) What are the task and duties of inspectors/auditors? 2
b) What are the major activities for an inspector during inspection of a pre-export consignment? 2
c) Write down the procedure for inspection of a processing establishment. 3
2. a) Name what kind of different fishery establishments in Bangladesh needs listing/registration for official control. 3
b) Define "Official Control of Fish and Fishery Products". Choose the documents required for getting approval from the Competent Authority for a newly established fish processing establishment in Bangladesh. 4
3. a) What is NRCP? Explain briefly the substance groups that are monitored in NRCP. 4
b) Explain briefly the sampling strategy of NRCP. 3
4. a) Define traceability. What are the purposes of introducing traceability system particularly in shrimp value chain of Bangladesh? Briefly outlined the benefit of introducing traceability in food chain. 4
b) Enlist the information that is necessary to record a farmer and depot owner to maintain traceability. 3
5. a) Discuss about different types of verifications practiced in fish processing plant in Bangladesh. 4
b) List down the intentionally and unintentionally added chemicals, veterinary drugs in fish farms, hatchery and fish feed mills. 3
6. a) "Receiving is a high risk zone of a fish processing plant"- Do you agree with this statement? 2
b) Why pre-export testing of fishery products is important? Justify. 2
c) What is factory own check system? What kind of testing is done in FIQC laboratory for analysis of microorganisms in fish and fishery products? 3
7. a) Describe briefly measures to be taken as per FIQC rule-7 after the return of fish which has been exported previously. 3
b) Write down the conditions of necessary facilities for fish landing center as outlined in FIQC rules in schedule 6. 4

Section-B

8. a) Enumerate sampling plan and microbiological limit for fishery products. 4
b) Describe briefly sample collection process of water and ice in a processing industry. 3
9. a) What is critical non-compliance? List down 8 key points of USFDA general sanitation conditions of the processing industry. 4
b) Briefly describe the inspection criteria of frozen fishery products. 3
10. a) What kinds of training programs are conducted for depot and factory personnel by FIQC officials? Explain. 3
b) Define critical non-compliant. Describe briefly eight key sanitation conditions and practices in the fish processing establishment. 4
11. a) Narrate the evaluation criteria of a processing plant which are checked during full verification. 4
b) List down six spore forming and non-spore forming bacteria usually contaminated in seafood. 3
12. a) Enlist some legal regulatory national legislation which is in place for official control of fishery products in Bangladesh. 2
b) Who will be an authorized officer for official control of fishery products in the processing establishment as per FIQC rule-3? 2
c) Explain briefly regulation (EC) No. 852/2004 Chapter II, Article 5. 3
13. a) Prepare a checklist for inspection of a depot. 3
b) List five international legislation in place in meeting the global requirements and getting export market access for fishery products. 4
14. Write down short notes any TWO of the following: 3.5 x 2 = 7
a) RASFF notification; b) Hatchery Act and rules and c) HACCP

Chattogram Veterinary and Animal Sciences University, Chattogram

Faculty of Fisheries

B. Sc. Fisheries (Hons.) Year -04, Semester-02 (July-December), Final Examination' 2022

Course No: BHM-402 (T), Course Title: Fish Breeding and Hatchery Management (Theory)

Total Marks: 70 Time: 3 hours

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

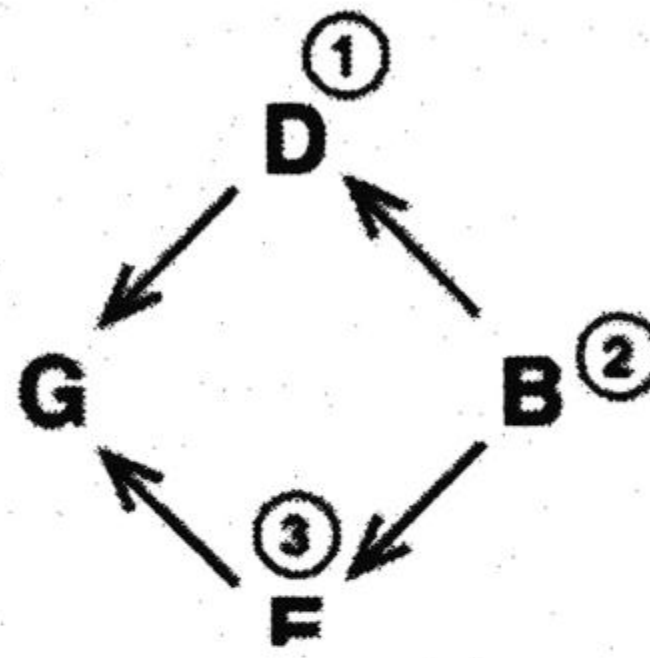
Section-A

1. a) What do you mean by natural breeding, induced breeding and bundh breeding? 3
b) Discuss about the present status of carp induced breeding and hatchery in Bangladesh. 4
2. a) Enlist the causes for decreasing wild fish fry in all ecosystem Bangladesh. 2
b) Suppose you are appointed as a hatchery manager to establish a new hatchery in Cox's Bazar region. What are the criteria you will consider to establish a hatchery? 5
3. a) What are the advantages of conditioning before fish fry transportation? 2
b) "Circular incubator is the main component in the card hatchery" – explain with pros and cons. 3
c) "Brine storage tank is essential component in shrimp/prawn breeding"- explain the statement. 2
4. a) Do you think that collecting eggs, larvae and fry from natural habitat is suitable for aquaculture and why? 3
b) How could you collect and maintain broodfish for induced breeding? 4
5. a) Why carps do not breed in captivity? 2
b) How you will prepare pituitary gland extract for induced breeding? 2
c) Which factor can affect the first feeding of fish? "Live fish is better than artificial feed for larvae as first feeding"- explain your opinion. 3
6. a) What are the measures you will take to breed the fish before spawning season? 2
b) Diagrammatically show the effect of environmental factors and endocrine gland in gonadal maturation. 2
c) Explain the role of gonadotropin hormone application in induced breeding. 3
- 7 Write short note on **any 02 (two)** of the following: 3.5 × 2 = 7
a) Transportation of broods, b) Modern larval rearing practice, c) Independent culling, and
d) Operational issues of fish hatchery

Section-B

8. a) What do you understand by quantitative phenotype and phenotypic variance? 2
b) " V_A is inherited"- explain. 2
c) Suppose, a fish farmer decides to initiate a selection program for increased growth rate in the *Mystusgulio*, which currently averages 110g at his farm. To implements his program, the farmer selects 70 females that average wt. 125g and 130 males that average wt. 115g. What will be the predicted average weight in the next generation? ($h^2 = 0.4$). 3
9. a) What are the roles of selection in fish breeding program? 2
b) What do you know about selection index? 2
c) In a given population of Tilapia, the weight (gm) of the fishes was as follows- 3
587, 659, 689, 710, 812, 677, 692, 703, 746, 530, 724, 616, 1024, 666, 739, 845, 549, 777, 492, 814, 725, 845, 670, 705, 770, 690, 820, 528, 790, 634, 802, 798, 655, 591, 735, 809, 757, 591, 603, 835, 505, 956, 501, 995, 698 776, 690, 752, 800, and 692g.
Select 10 fishes for stabilizing selection program.
10. a) What is inbreeding and what are the effects of inbreeding? 3
b) Briefly describe how you will control the rate of inbreeding in your hatchery? 4

11. a) Establish a relationship between inbreeding and effective breeding number. 2
 b) "Inbreeding could be helpful for producing outstanding/test animals"- justify the statement. 2
 c) Calculate the inbreeding from the following path for the population G where the common ancestor B have inbreeding value was 1.13. 3



12. a) What do you know about two-breed cross, top-crossing and back crossing? 2
 b) Explain interspecific and intergeneric hybridization with example. 2
 c) Suppose, a carp farmer decides to initiate a hybridization program using *Labeo rohita* (average weight 1630gm) and *Labeo calbasu* (average weight 1750gm). The farmer found average offspring weight 1380 gm when mated with *Labeo rohita* male and *Labeo calbasu* female. In another mating, the farmer found average offspring weight 1830 gm when mated with *Labeo rohita* female and *Labeo calbasu* male. In which cases, hybrid vigor will be produced? 3
13. a) How can you prevent unintentional selection in our hatcheries? 2
 b) Differentiate between inbreeding and hybridization. 2
 c) "Hybridization does not produce good broodstock"- Explain. 3
14. Write short note on **any 02 (two)** of the following: 3.5 × 2 = 7
 a) Family selection, b) Epistatic genetic variance, c) Pedigree analysis, and d) Outbreeding depression

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Faculty of Fisheries
B. Sc. Fisheries (Hons.), Year-04, Semester-02 (July-December), Final Examination' 2022
Course No. FFT-402(T), Course Title: Fish Feed Technology (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) | Classify the fish feed based on the stage of life cycle of fish. | 3 |
| | b) | Outline the current problems and constraints in the manufacturing and use of aquafeeds in Bangladesh. | 4 |
| 2. | a) | Enlist the criteria for selecting feed antioxidants during feed formulation. | 4 |
| | b) | Why feeding rate and frequency are important for the successful feed management in aquaculture? | 3 |
| 3. | a) | Define anti-nutritional factors. Are anti-nutritional factors a major concern when formulating fish feed, and if so, why? | 3 |
| | b) | Briefly describe the anti-nutritional factors present in soy-based feed ingredients. | 4 |
| 4. | a) | What is feed pelleting? Differentiate between compressed pellets and extruded dry pellets. | 3 |
| | b) | Provide a schematic explanation of the relationship between appetite and satiation in fish. | 4 |
| 5. | a) | What are the functions of immunostimulant, enzymes and pigments in aquaculture production? | 3 |
| | b) | Write down the major features of the Fish Feed and Animal Feed Act-2010. | 4 |
| 6. | a) | Define feed formulation. Write down the limitations of Pearson square feed formulation technique. | 2 |
| | b) | Formulate a 28% crude protein (CP) based diet for tilapia through Pearson square feed formulation technique by using the following ingredients: Fishmeal (55% CP), Ground nut cake (34.5% CP), Soybean meal (45.0% CP), Rice bran (12.8 % CP) and maize meal (9.8% CP). | 5 |
| 7. | Write short notes on any two of the following: | | 3.5×2=7 |
| | a) Adventitious toxins; b) Microencapsulated diet and c) Least-cost feed formulation | | |

Section B

- | | | | |
|-----|--|--|---------|
| 8. | a) | Define digestibility. Write down the factors affecting digestibility. | 3 |
| | b) | Differentiate between apparent and true nutrient digestibility. | 4 |
| 9. | a) | Write down the chemical, physiological and recommended inclusion rate of the following feed ingredients: i) Fishmeal; ii) Cotton seed meal; iii) Soybean meal and iv) Blood meal | 4 |
| | b) | What are the by-products derived from soybean during processing? | 3 |
| 10. | a) | Distinguish between conventional and non-conventional feedstuffs. | 3 |
| | b) | List down the conventional and non-conventional feedstuffs available for feed formulation in Bangladesh. | 4 |
| 11. | a) | What are the benefits of aquafeed storage? | 2 |
| | b) | Discuss the causes of the deteriorative effects in feed and feedstuffs during storage. | 5 |
| 12. | a) | Illustrate different steps of food intake by fish. | 3 |
| | b) | Explain in details the factors influencing food intake in fish. | 4 |
| 13. | a) | Describe different methods for feed evaluation. | 2 |
| | b) | The juvenile sea bass with an initial average weight of 11.52 g was stocked in a recirculating aquaculture system (RAS) for 90 days. At harvest, the average weight of fish becomes 53.44g. During the culture period, the average feed intake was 84.37g. It is assumed that there was no mortality. The supplied feed contains 11% moisture and 40% protein. Calculate the following parameters: | 5 |
| | | 1. Percent weight gain | |
| | | 2. Specific growth rate | |
| | | 3. Feed conversion ratio | |
| | | 4. Protein efficiency ratio | |
| 14. | Write short notes on any two of the following: | | 3.5×2=7 |
| | a) Probiotics; b) Protease inhibitors and c) On-farm fish feed | | |