

Chattogram Veterinary and Animal Sciences University, Chattogram

Faculty of Fisheries

B.Sc. Fisheries (Hons.) Year - 4 Semester -2 (July-December), Final Examination, 2020

Course No: FFT 402 (T), Course Title: Fish Feed Technology (Theory)

Full Marks: 70; Time: 3 hours

Answer **any 5 (five)** questions from each section. Figures in the right margin indicate full marks. 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. Write down briefly the factors need to be considered for selection of potential feedstuffs for feed formulation. 4
2. a. Enlist the criteria for selecting feed antioxidants for feed formulation. 2
b. Write down the scientific name of the following ingredients used for feed formulation in Bangladesh: 3
i) Cotton seed; ii) Soyabean; iii) Linseed; iv) Sesame; v) Mustard oilcake and vi) Water hyacinth 2
3. a. Explain in details the different types of feed available in Bangladesh for aquaculture organisms. 4
b. Illustrate the advantages and disadvantages of formulated feeds used in Bangladesh. 3
4. a. Define the Best-Buy Ingredients method and how to apply it in feed formulation. 4
b. Formulate a 26% crude protein based diet for carp by using the following ingredients where fishmeal level is fixed at 10% of the dietary ingredients. 3
Fish meal: CP, 55.0%; Groundnut cake: CP, 34.5%; Soybean meal: CP, 46.8%; Rice bran: CP, 13.3%; Maize meal: CP, 9.8%
5. 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
6. a. Explain in details the general consideration needs to follow in formulating practical diet. 3
b. Classify the major ingredients based on nutritional point of view. 4
7. Write short notes on any 02 (two) of the following: 3.5x2=7
i) Antioxidants; ii) Least-cost feed formulation; iii) Poultry by-products

Section B

8. a. Describe different methods for feed evaluation. 4
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: 3
I. Percent weight gain
II. Specific growth rate
III. Feed conversion ratio
IV. Protein efficiency ratio
9. a. Write down the different types of quality losses that are occurred in fish during storage? 2
b. Briefly describe the different stages of fish feed manufacturing process. 5
10. a. Define digestibility? Write down the factors affecting digestibility? 3
b. Differentiate between apparent and true nutrient digestibility? 4
11. a. Write down the chemical, physiological and recommended inclusion rate any 3 of following feed ingredients: i) Fishmeal; ii) Cotton seed meal; iii) Soybean meal and iv) Blood meal 3
b. What are the by-products derived from soybean during processing? 4
12. a. Define feed storage? Explain in details the importance of storage of aqua-feed. 6
b. Write down the general guidelines for storage of aqua-feed? 1
13. a. Write down the major features of Fish Feed and Animal Feed Act-2010. 4
b. Schematically show the relationship between appetite and satiation. 3
14. Write short notes on any 02 (two) of the following: 3.5x2=7
i) Purified & simplified diet; ii) Probiotics; iii) Protease inhibitors

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B.Sc. Fisheries (Hons.) Year -4, Semester -2 (July-December), Final Examination, 2020

Course No: **FIL-402 (T)**, Course Title: **Fish Inspection and Legislation (Theory)**

Full Marks: 70; Time: 3 hours

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

Section-A

1. a) Explain briefly the importance of safety and quality in fishery products. 1.5
b) List down some naturally occurring biotoxins in fishery products 1.5
c) List down the name of some intentionally or unintentionally added chemicals/veterinary drugs in fisheries establishments. 4
2. a) Define CCA, RCA and LCA. 1.5
b) Mention some legal regulatory national legislations in place for official control of fishery products in Bangladesh. 2
c) In addition to the regulation, mention some policies and guidelines in place for official control of fishery products in Bangladesh. 3.5
3. a) Define inspection and audit. Prepare a checklist for monitoring/inspection of fish farm. 3
b) Explain briefly inspection procedure of auditors/inspectors in the processing establishment. 4
4. a) What are the major activities for an inspector? 2
b) Explain the components of traceability system of shrimp value chain. 2
c) Illustrate the organogram of FIQC. 3
5. a) Define audit. Explain briefly about the full verification/audit of a newly established processing factory. 4
b) Explain briefly preparations that are needed for the auditors/inspectors before arriving the fish processing establishment in conducting audit/verification. 3
6. a) What is NRCP? Mention the objectives of NRCP. 2
b) What are the investigation measures needed to be taken in case of NRCP positive results? 2.5
c) Explain briefly the sampling strategy of NRCP. 2.5
7. a) Enumerate the measures to be taken after the return of fish which has been exported previously as outlined in FIQC rule-7. 3.5
b) Write down the conditions of necessary facilities for fish landing center, service center and vending center as outlined in FIQC rules in schedule 6. 3.5

Section-B

8. a) Mention the objectives of food law. 2
b) Outline briefly the Fish and Animal Feed Act, 2010 and rules 2011. 5
9. a) Why pre export testing of fishery product is important? What are the major issues and challenges in seafood industry? 4
b) Enlist some legal regulatory national legislation which is in place for official control of fishery products. 2
c) Differentiate between food infection and food intoxication with example. 1
10. a) Briefly discuss the mechanism for listing newly established fish processing establishment. 4
b) Identify the control measures of pathogenic bacteria, chemicals, parasites and physical hazards in fishery products. 3
11. 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 depots. 3
12. a) Describe briefly sample collection process for the purpose of microbiological testing in fish and fishery products. 4
b) Write in brief the substance groups that are monitored under NRCP program. 3
13. 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 system in food chain. 3.5
b) Explain briefly sample collection procedure from the processing establishment for microbiological testing of fish and fishery products. 3.5
14. Write short notes on any 2 (TWO) of the following: 3.5 x 2 = 7
a) RASFF notification; b) Hatchery Act and Rules; and c) HACCP.

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B. Sc Fisheries (Hons.), Year -04, Semester-02 (July-December), Final Examination, 2020

Course Code: BHM- 402 (T), Course Title: Fish Breeding and Hatchery Management (Theory)

Full Marks: 70

Time: 3 hours

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

Section-A

1. a. Outline the present status of carp induced breeding and hatchery in Bangladesh. 4.0
b. Discuss the role of hatchery in meeting the fish seed production for aquaculture. 3.0
2. a. What is incubator? Mention the major features of an incubator. 2.0
b. Explain the functional mechanism of a circular incubator. 3.0
c. Which incubator is the best for incubation of finfish eggs? Explain. 2.0
3. a. Explain how environmental factors and endocrine secretions impact on the gonadal maturation and ovulation in fishes. 3.0
b. 'Proper technical, personal and economic considerations are prerequisite for successful hatchery operation'-justify the statement. 4.0
4. a. Describe the mostly used live fish transportation system in Bangladesh with its merits and demerits. 4.0
b. What are the advantages of conditioning of fish fry before transportation? 2.0
c. Which factors affect the oxygen consumption in oxygenated polybag during transportation? 1.0
5. a. What are the factors to be considered during fish fry rearing? 2.0
b. Which fish fry rearing technique is more effective? Justify your answer. 3.0
c. "Feeding frequency and feed particle size affect the growth and survival of larvae during rearing"- Explain the statement. 2.0
6. a. Define selection. What is the role of selection in fish breeding program? 2.0
b. Briefly discuss about selection index and family selection. 3.0
c. Why no selection is the best selection for fish breeding program? 2.0
7. a. Differentiate between inbreeding and gene introgression. 2.0
b. 'Inbreeding changes genotype frequencies'-Explain. 2.0
c. What is effective breeding number? Make a relationship between effective breeding number and inbreeding. 3.0

Section-B

8. a. Define fish hatchery and hatchery management. 1.0
b. List down the components of a finfish hatchery. 1.0
c. Which features must be considered if you are asked to select a site for finfish hatchery? 3.0
d. Do you think that collection of eggs, larvae or fry from natural habitats is suitable for aquaculture? – justify your answer. 2.0
9. a. What is inbreeding? Mention the consequences of inbreeding. 2.0
b. Describe briefly how will you control the rate of inbreeding in hatchery population. 5.0
10. a. What is hybridization? Mention its applications. 2.0
b. Explain the statement "The result of hybridization is unpredictable". 3.0
c. Hybridization is a major problem in quality seed production in hatcheries- explain. 2.0
11. a. What is brood fish and culled fish? Write down the importance of broodstock nutrition and genetics in fish hatchery. 4.0
b. How will you identify ready to spawn male and female Indian major carps? 3.0
12. a. Differentiate between induced spawning and artificial spawning. 2.0
b. How will you control onset of fish spawning? 3.0
c. How you will identify ready to spawn broodfish for induced breeding? 2.0
13. a. Which factors can affect the first feeding of fish? 1.0
b. Live food is better than artificial feed for larvae as first feeding- explain. 2.0
c. Explain the influence of temperature on yolk-sac absorption and first feeding of fish larvae. 4.0
14. Write short notes on **any 02 (two)** of the following: 3.5×2= 7.0
 - i) Waste water treatment; ii) Prospects of biofloc system in larval rearing; iii) Heterosis; and
 - iv) Cryopreservation of gametes

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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.