

Chittagong Veterinary and Animal Sciences University, Chittagong
Faculty of Fisheries

B. Sc. Fisheries (Hons.) Year -4 Semester-2, Final Examination' 2018
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

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|----|----|--|-------------|
| 1. | a) | What is supplementary feed? | 1 |
| | b) | Discuss about the selection criteria of feed ingredients, feed formulation and preparation. | 6 |
| 2. | a) | Illustrate the different feeding habits of fish and give two examples for each feeding habits. | 4 |
| | | Explain the following terminology used in fish feed technology- | 3 |
| | | i) Extruded feed ; ii) FCR; iii) FER; iv) Semi-moist diet; v) non-specific immunostimulant | |
| 3. | a) | Describe the importance of storage of aqua-feeds. | 3 |
| | b) | Summarize the different preventive measures during storage of aqua-feed | 4 |
| 4. | a) | Mention the non-nutrient components of diets. | 1 |
| | b) | Write note on any two of the following components- | 6 |
| | | i) Binders; ii) Fibre; iii) Stimulant | |
| 5. | a) | Describe the 'pearson square' method and discuss how to apply pearson square method for feed formulation? | 3 |
| | b) | Formulate a diet containing 26% crude protein (CP) for carp using-
Squid meal: CP 88%, Fish silage: CP 65%, Corn meal: CP 22%, Wheat flour: CP 16%. | 4 |
| 6. | | Describe the manufacturing process and recommended inclusion levels in fish feed of any two of the following- | 3.5×2=7 |
| | | i) Fish meal; ii) Soybean meal; iii) Blood meal | |
| 7. | | Write down short notes on any two of the followings: | 3.5 X 2 = 7 |
| | a) | Protease inhibitor; b) Probiotics; c) Larval diet | |

Section -B

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|-----|----|--|-------------|
| 8. | | Discuss the material flow in feed manufacturing. | 7 |
| 9. | a) | What are the characteristics of a quality feed? | 2 |
| | b) | Discuss fish feed on the basis of life cycle stages of fish. | 5 |
| 10. | a) | Define the anti-nutritional factors in feed formulation and write down the major four groups of antinutrients of plant origin. | 5 |
| | b) | Write down the commonly available dietary ingredient sources for feed formulation. | 2 |
| 11. | a) | Define digestibility. Write down the factors affecting digestibility. | 5 |
| | b) | Differentiate between apparent and true nutrient digestibility. | 2 |
| 12. | a) | List down the conventional and non-conventional feed stuffs available for feed formulation. | 3 |
| | b) | Distinguish between conventional and non-conventional feedstuffs. | 4 |
| 13. | a) | Write down the importance of fish feed laws and regulations. | 2 |
| | b) | Describe the international code of conducts for inclusion of feed ingredients in fish feed formulation. | 5 |
| 14. | | Write down short notes on any two of the followings: | 3.5 X 2 = 7 |
| | | a) Feeding frequency b) Poultry by-products meal; c) Feeding response | |

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B. Sc. Fisheries (Hons.) Year -4, Semester-2, Final Examination' 2018

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. Figures in the right margin indicate full mark. Use separate answer script for each section.

Section-A

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|----|----|--|---|
| 1. | a) | What is fish hatchery? Mention its importance in aquaculture. | 2 |
| | b) | Explain the genetic problems related to quality brood production in fish hatcheries. | 3 |
| | c) | Can brood bank improve the quality of seeds and how? | 2 |
| 2. | a) | Outline the major considerations in the site selection of a prawn hatchery. | 3 |
| | b) | Describe the components of hatchery proper of a finfish hatchery. | 3 |
| | c) | Differentiate a finfish hatchery from a prawn hatchery. | 1 |
| 3. | a) | What do you know about brood fish? | 1 |
| | b) | Explain the broodstock replacement practices followed by hatchery operators with diagram. | 3 |
| | c) | Explain the importance of stocking density and nutrition in broodstock management? | 3 |
| 4. | a) | What is incubator? Mention its special features. | 2 |
| | b) | Write the functional mechanism of a circular incubator. | 3 |
| | c) | Which incubator is best for incubation of finfish eggs? Explain. | 2 |
| 5. | a) | What is induced spawning? Make a list of inducing agents widely used in fish spawning. | 2 |
| | b) | Explain how environmental factors and endocrine secretions impact on the gonadal maturation and ovulation in fishes. | 5 |
| 6. | a) | What is inbreeding? Mention the consequences of inbreeding. | 2 |
| | b) | How will you calculate inbreeding value using pedigree method of a hatchery population? | 5 |
| 7. | a) | What is selection? Make a list of different types of selection programme. | 2 |
| | b) | What type of selection program will you use to achieve a particular goal and why? | 2 |
| | c) | 'No selection is the best selection'- justify the statement. | 3 |

Section-B

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|-----|---|---|----------|
| 8. | a) | What is hybridization? Mention its applications. | 2 |
| | b) | What component of genetic variance is exploited by hybridization and how? | 2 |
| | c) | Hybridization is a big problem in quality seed production in hatcheries-explain why. | 3 |
| 9. | a) | What are the important things need to be considered for fry rearing? | 4 |
| | b) | Mention the advantages and disadvantages of using artificial feed in fry rearing. | 2 |
| | c) | Make a list of commonly used live food in fish hatcheries. | 1 |
| 10. | a) | Define heterosis. Explain heterosis with an example. | 3 |
| | b) | Differentiate between cross breeding and hybridization. Describe different cross breeding programmes. | 4 |
| 11. | a) | What do you mean by effective breeding number and inbreeding co-efficient? | 2 |
| | b) | Why effective breeding number and genetic drift are inversely related? | 2 |
| | c) | Explain rotational line crossing as a control measure of inbreeding. | 3 |
| 12. | a) | Define fertilization, ovulation and embryo. | 2 |
| | b) | Explain with example the effects of incubation temperature on hatching of fish eggs. | 5 |
| 13. | a) | What is conditioning? Why conditioning is important during live fish transportation? | 2 |
| | b) | Describe modern live fish transportation systems mostly used in Bangladesh with their advantages and disadvantages. | 5 |
| 14. | Write notes on any 02(Two) of the followings: | | 3.5×2= 7 |
| | i) History of induced breeding of fish; ii) Genetic drift and iii) Cost-benefit analysis of a hatchery. | | |

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B. Sc. Fisheries (Hons.) Year -4 Semester-2, Final Examination' 2018
Course No: **FIL-402 (T)**, Course Title: **Fish Inspection & 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.*

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|-------------------------|----|---|----------------|
| 1. | a) | What do you mean by RASFF? | 2.0 |
| | b) | Enumerate the major inspection activities of FIQC. | 2.0 |
| | c) | Write down the organogram of FIQC. | 3.0 |
| 2. | a) | Differentiate between food infection and food intoxication with examples. | 1.5 |
| | b) | Name some spore forming and non-spore forming bacteria usually contaminated in seafood. | 2.5 |
| | c) | Explain briefly some control measures for pathogenic bacteria in processing of fishery products. | 3.0 |
| 3. | a) | Why pre-export testing of fishery products is important? Explain. | 2.0 |
| | b) | Write down main features of Fish Feed and Animal Feed Act. 2010. | 5.0 |
| 4. | a) | Explain the components of traceability system of shrimp value chain. | 2.0 |
| | b) | Enumerate some movement documents which are used by stakeholders in fish supply chain for maintaining traceability records. | 5.0 |
| 5. | a) | Name of different kinds of fishery establishments in Bangladesh which needs listing/registration for official control | 3.0 |
| | b) | Define "Official Control of Fish and Fishery Products". Choose the documents required in getting approval from the Competent Authority for a newly established fish processing establishment in Bangladesh. | 4.0 |
| 6. | a) | Mention sampling plan and microbiological limit for fish and fishery products. | 4.0 |
| | b) | Explain briefly the task and duties of FIQC inspectors/auditors. | 3.0 |
| 7. | a) | Define critical non-compliant? Describe briefly eight key sanitation conditions and practices in the fish processing establishment. | 4.0 |
| | b) | Differentiate between medium and low risk levels of non-compliance. Explain briefly key points of GMP conditions and practices in a fish processing establishment. | 3.0 |
| <u>Section B</u> | | | |
| 8. | a) | Outline the objectives of food law? | 1.0 |
| | b) | Mention some legal regulatory national legislation in place for official control of fishery products in Bangladesh. | 2.0 |
| | c) | In addition to the regulation, mention some policies and guidelines in place for official control of fishery products in Bangladesh. | 4.0 |
| 9. | a) | List some international legislation in place in meeting the global requirements and getting export market access for fishery products. | 4.0 |
| | b) | Explain briefly regulation (EC) No 852/2004 Chapter II, Article 5. | 3.0 |
| 10. | a) | Define NRCP? Explain briefly the policy guideline for implementing NRC in Bangladesh. | 3.0 |
| | b) | Outline briefly the Fish and Animal Feed Act, 2010 and rules 2011. | 4.0 |

11. a) Explain briefly as per FIQC rule 3, who is an authorized officer for official control of fish and fishery products. 3.0
- b) Interpret briefly as per FIQC rule-7, what kind of measures need to be taken when non-compliant consignment of fishery products return to Bangladesh after rejection from importing country. 4.0
12. a) Identify the control measures of pathogenic bacteria, chemicals, parasites and physical hazard in fishery products. 3.0
- b) Suppose you are a member of specialized audit team and have been asked to audit a fish processing industry. Discuss how will you do that. 4.0
13. a) State briefly the sampling plan and microbiological limit for fish and fish products (ICMSF- 1986). 4.0
- b) Prepare a checklist for inspection of fish and shrimp farms. 3.0
14. Write notes on the followings (any two): 3.5 x 2.0
- i) Testing facilities of fisheries products in Bangladesh; (ii) Hatchery Act and rules; & (iii) Importance of Fish Inspection and legislation course.