

Chattogram Veterinary and Animal Sciences University, Chattogram

Faculty of Fisheries

B. Sc. Fisheries (Hons.) Year -01 Semester-02 (July-December), Final Examination 2021

Course No: HPF-102 (T), Course Title: **Handling and Preservation of Fish (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) What do you mean by handling and preservation of fish? Discuss the importance of this course. 3
b) What do you know about proximate composition of fish? Describe physical structure of fish muscle with diagram. 4
2. a) Define rigor-mortis. Briefly discuss the factors influencing rigor mortis of fish. 3
b) Draw a flow diagram on post mortem changes in fish. 4
3. a) Explain in brief the cleaning steps of a fish working premise. 3
b) Draw a layout of an ideal shrimp processing plant. 4
4. a) Differentiate between perishable and semi-perishable food products. 2
b) How lipid content contributes to palatability and perishability of fish? 2
c) Discuss the causative agents responsible for fish spoilage. 3
5. a) Define fish packaging. Write down the functions of fish packaging. 3
b) Identify good practices in boxing of fish for transportation. 4
6. a) Discuss briefly the principles of fish preservation. 3
b) Describe the factors affecting successful transportation of live fish. 4
7. a) Every 1-hour delay in fish chilling reduces 1-day shelf-life of fish-Justify your answer. 3
b) Briefly explain quality problems occur in fish during freezing and subsequent storage. 4

Section B

8. a) Diagrammatically show the operations of catch handling of pelagic and demersal fish. 3
b) Discuss the aims of commercial handling of fish. Describe briefly good handling practices on board fishing vessels. 4
9. a) 'Vitamins and minerals are essential to maintain biological functions'-justify the statement. 3
b) Write down the functions of protein. Classify fish protein based on its solubility. 4
10. a) How gapping, toughness and drip-loss are related with the quality changes during rigor mortis? 3
b) Define glazing. Briefly explain the present status of shrimp processing industries in Bangladesh. 4
11. a) Differentiate between quick- and slow freezing. Why fish is frozen at -40 °C but stored at -18 °C? 3
b) Draw and explain the temperature profile of freezing fish. Write down the importance of "thermal arrest time" in the freezing curve. 4
12. a) What is chilling? Write down the different methods of fish chilling. 3
b) 'Fish muscle is more easily digestible than other meat muscle'- justify the statement. 2
c) Explain briefly the properties of fish white and dark muscles. 2
13. a) What is fish conditioning? How conditioning helps in reduction of fish mortality during transportation? 3
b) Discuss the advantages and disadvantages of different live fish transportation methods. 4
14. Write short notes on **any two** of the following: 3.5 x 2=7
a) Air freight packaging; b) Cold storage; and c) Fish supply chain

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B. Sc. Fisheries (Hons) Year-01, Semester-02 (July-December) Final Examination' 2021

Course Code: LAN – 102 (T), Course Title: **Communicative English (Theory)**

Total Marks: 35 Time: 2 Hours

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

Section: A

1. Correct the following sentences if they are incorrect. If a sentence is correct, just copy it. 5
 - a. He went to work despite of his illness.
 - b. It is recommended that every student studies on a regular basis.
 - c. It is I who is to blame for this incident.
 - d. One of my friends were absent today.
 - e. What has you been able to find out?

2. Complete the following sentences. 5
 - a. If I'd seen him, _____
 - b. _____ as people have almost stopped eating balanced diet.
 - c. He confessed that _____.
 - d. If you want to travel to Switzerland, _____.
 - e. A graveyard is a place _____.

3. Despite Bangladesh's long coastline and large freshwater and marine water bodies, fisheries are underdeveloped compared to other industry sectors. Inland fisheries production has increased over the years, but the productivity per hectare water area is not yet attained at its optimum. Now, write a letter to the editor of an English daily stating how fish production could be increased utilizing numerous water bodies of Bangladesh. 7

Section: B

4. Change the following sentences as directed: 5
 - a. I noticed the shouting of the boys (Make it passive)
 - b. Cigarettes are known to be poisonous for people's health. (Change the voice.)
 - c. The girl said, "It gives me great pleasure to be here this evening." (Change the speech.)
 - d. Tom asked Bob if he (Bob) had seen his (Tom's) wristwatch that he (Tom) had lost the previous day. (Change the speech.)
 - e. He opened the door and asked for my permission to come in (Make it complex.)

5. Write a paragraph of about 150 words on "The importance of having good friends in life". 5

6. Read the passage carefully and answer the questions that follow.

8

A Japan has a significantly better record in terms of average mathematical attainment than England and Wales. Large sample international comparisons of pupils' attainments since the 1960s have established that not only did Japanese pupils at age 13 have better scores of average attainment, but there was also a larger proportion of 'low' attainers in England, where, incidentally, the variation in attainment scores was much greater. The percentage of Gross National Product spent on education is reasonably similar in the two countries, so how is this higher and more consistent attainment in maths achieved?

B Lower secondary schools in Japan cover three school years, from the seventh grade (age 13) to the ninth grade (age 15). Virtually all pupils at this stage attend state schools: only 3 per cent are in the private sector. Schools are usually modern in design, set well back from the road and spacious inside. Classrooms are large and pupils sit at single desks in rows. Lessons last for a standardised 50 minutes and are always followed by a 10-minute break, which gives the pupils a chance to let off steam. Teachers begin with a formal address and mutual bowing, and then concentrate on whole-class teaching.

Classes are large — usually, about 40 — and are unstreamed. Pupils stay in the same class for all lessons throughout the school and develop considerable class identity and loyalty. Pupils attend the school in their own neighbourhood, which in theory removes ranking by school. In practice in Tokyo, because of the relative concentration of schools, there is some competition to get into the 'better' school in a particular area.

C Traditional ways of teaching form the basis of the lesson and the remarkably quiet classes take their own notes of the points made and the examples demonstrated. Everyone has their own copy of the textbook supplied by the central education authority, Monbusho, as part of the concept of free compulsory education up to the age of 15. These textbooks are, on the whole, small, presumably inexpensive to produce, but well set out and logically developed. (One teacher was particularly keen to introduce colour and pictures into maths textbooks: he felt this would make them more accessible to pupils brought up in a cartoon culture.) Besides approving textbooks, Monbusho also decides the highly centralised national curriculum and how it is to be delivered.

D Lessons all follow the same pattern. At the beginning, the pupils put solutions to the homework on the board, then the teachers comment, correct or elaborate as necessary. Pupils mark their own homework: this is an important principle in Japanese schooling as it enables pupils to see where and why they made a mistake, so that these can be avoided in future. No one minds mistakes or ignorance as long as you are prepared to learn from them.

After the homework has been discussed, the teacher explains the topic of the lesson, slowly and with a lot of repetition and elaboration. Examples are demonstrated on the board; questions from the textbook are worked through first with the class, and then the class is set questions from the

textbook to do individually. Only rarely are supplementary worksheets distributed in a maths class. The impression is that the logical nature of the textbooks and their comprehensive coverage of different types of examples, combined with the relative homogeneity of the class, renders work sheets unnecessary. At this point, the teacher would circulate and make sure that all the pupils were coping well.

E It is remarkable that large, mixed-ability classes could be kept together for maths throughout all their compulsory schooling from 6 to 15. Teachers say that they give individual help at the end of a lesson or after school, setting extra work if necessary. In observed lessons, any strugglers would be assisted by the teacher or quietly seek help from their neighbour. Carefully fostered class identity makes pupils keen to help each other — anyway, it is in their interests since the class progresses together.

This scarcely seems adequate help to enable slow learners to keep up. However, the Japanese attitude towards education runs along the lines of 'if you work hard enough, you can do almost anything'. Parents are kept closely informed of their children's progress and will play a part in helping their children to keep up with class, sending them to 'Juku' (private evening tuition) if extra help is needed and encouraging them to work harder. It seems to work, at least for 95 per cent of the school population.

F So what are the major contributing factors in the success of maths teaching? Clearly, attitudes are important. Education is valued greatly in Japanese culture; maths is recognised as an important compulsory subject throughout schooling; and the emphasis is on hard work coupled with a focus on accuracy.

Other relevant points relate to the supportive attitude of a class towards slower pupils, the lack of competition within a class, and the positive emphasis on learning for oneself and improving one's own standard. And the view of repetitively boring lessons and learning the facts by heart, which is sometimes quoted in relation to Japanese classes, may be unfair and unjustified. No poor maths lessons were observed. They were mainly good and one or two were inspirational.

Choose the correct heading for sections **B - F** from the list of headings below.

Write the correct number, **i—ix**, beside question number **a—e** on your answer sheet.

List of Headings

- i The influence of Monbusho
- ii Helping less successful students
- iii The success of compulsory education
- iv Research findings concerning achievements in maths
- v The typical format of a maths lesson
- vi Comparative expenditure on maths education
- vii Background to middle-years education in Japan
- viii The key to Japanese successes in maths education
- ix The role of homework correction

- a) Section B
- b) Section C
- c) Section D
- d) Section E
- e) Section F

Example:

Section A Answer iv

Choose the correct letter, A, B, C or D.

- f) Maths textbooks in Japanese schools are
 - A. cheap for pupils to buy.
 - B. well organised and adapted to the needs of the pupils.
 - C. written to be used in conjunction with TV programmes.
 - D. not very popular with many Japanese teachers.
- g) When a new maths topic is introduced,
 - A. students answer questions on the board.
 - B. students rely entirely on the textbook.
 - C. it is carefully and patiently explained to the students.
 - D. it is usual for students to use extra worksheets.
- h) How do schools deal with students who experience difficulties?
 - A. They are given appropriate supplementary tuition.
 - B. They are encouraged to copy from other pupils.
 - C. They are forced to explain their slow progress.
 - D. They are placed in a mixed-ability class.

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B. Sc. Fisheries (Hons.) Year -01 Semester-02 (July-December) Final Examination' 2021

Course Code: **WQM-102 (T)**, Course Title: **Water Quality 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

1. a) Why is water quality management important for aquaculture? 2
b) Write down the significance of water depth and light in maintaining water quality in fish pond. 2
c) Mention the acceptable range of water quality parameters required for aquaculture. 3
2. a) Define turbidity. 1
b) Explain the effects of turbidity in a fish pond. 3
c) How can you control turbidity of an aquaculture pond? 3
3. a) How will you identify and solve H₂S gas problem in pond? 2
b) What do you know about different forms and toxicity of ammonia in aquaculture? 2
c) How will you manage ammonia toxicity in fish pond? 3
4. a) What are the sources of dissolved oxygen (DO) in a waterbody? 2
b) Explain the relationship between DO and CO₂ in a pond. 2
c) What are the methods can be applied for the management of DO in a fish pond? 3
5. a) Classify water pollutants based on source. 2
b) What do you mean by eutrophication and biomagnification? 2
c) What are the major causes of pollution in waterbody? 3
6. a) How do you compare carp and cat fishes based on tolerance of different water quality parameter? 2
b) Why does water pH value fluctuate from morning to evening? 2
c) How will you maintain good water quality in a fish hatchery? 3
7. a) What are the problems associated with overfeeding in aquaculture? 2
b) Note down different liming agents and explain which one is best to use in aquaculture? 2
c) Why is nitrogen fertilizer less important than phosphorus fertilizer in fish pond? 3

Section B

8. a) What do you mean by TAN? 1
b) What are the significance of temperature in fish production? 3
c) How do you avoid overfeeding problem in fish pond? 3
9. a) Which form of iron is more harmful for fish culture? Explain. 2
b) How do you solve iron problem in fish hatchery? 2
c) How does excess iron affect fish? 3
10. a) What are the sources of ammonia in fish pond? 2
b) What are the effects of high pH on aquatic life? 2
c) How will you maintain acceptable range of pH in fish pond? 3
11. a) What are the characteristics of persistent organic pollutants (POPs)? 2
b) List down the major water pollutants with example. 2
c) What are the effects of water pollution on aquatic animals? 3
12. a) Why does fertilization important in aquaculture? 2
b) When shouldn't you fertilize the pond? 2
c) What are the roles of liming in aquaculture? 3
13. a) Classify vital water quality variables for pond aquaculture. 3
b) Describe briefly the interactions among pH, CO₂, alkalinity and hardness in fish ponds. 4
14. a) What aspects to be considered during site selection for cage culture? 2
b) How does water quality maintain in Recirculatory Aquaculture System? 2
c) What are the different criteria need to be considered in integrated culture system? 3

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B. Sc. Fisheries (Hons.) Year -01 Semester-02 (July-December) Final Examination' 2021
Course Code: ASS-102 (T), Course Title: Aquatic Soil Science (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) Define soil and soil science. 3
b) Write down the importance of studying aquatic soil science in fisheries. 4
2. a) Define pH. 1
b) Write down the importance of soil pH. 2
c) Discuss the mechanism of buffering in soils. 4
3. a) Name the essential nutrients of plants. 2
b) Write down the different management procedures of pond bottom mud for aquaculture. 5
4. a) Write down the problems of clay soil in aquaculture. 3
b) Describe briefly the general management of clay soils. 4
5. a) Differentiate between actual acid sulphate soil and potential acid sulphate soil. 2
b) Discuss the management and reclamation of acid sulphate soils. 5
6. a) What are the processes of increasing beneficial microorganisms? 2
b) List the soil microorganisms with mentioning their action in soil. 5
7. Write short notes on **any two** of the following: 3.5x2=7
a) Soil structure; b) Cation Exchange Capacity; and c) Importance of soil microorganism.

Section B

8. a) What are the components of soil? 2
b) List down the physical and chemical properties of soil. 2
c) Differentiate among sand, silt and clay based on their properties. 3
9. a) What do you mean by soil textural class? 2
b) Discuss the suitability of soil textural class for fish culture, pond construction and fisheries management. 5
10. a) List down cations and anions, which are mostly common in soil. 2
b) Briefly describe nutrient exchange process between soil and plant. 5
11. a) Define Bioturbation, with the examples for bioturbators. 2
b) Write down the effects of bioturbation on physicochemical properties of overlying water. 5
12. a) What are the advantages and disadvantages of developing aquaculture on sandy soil? 3
b) Write down the management practices of sandy soils for aquaculture. 4
13. a) What is salted soil? 1
b) What are the available soluble salts in salted soils? 3
c) Define Saline, Sodic and Saline-Sodic soils. 3
14. Write short notes on **any two** of the following: 3.5x2=7
a) Soil density; b) Soil temperature; and c) Impacts of acid sulphate soil.

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B. Sc. Fisheries (Hons.) Year -01 Semester-02 (July-December), Final Examination 2021

Course Code: EME-102 (T), Course Title: Estuarine and Marine Ecology (Theory)

Total Marks: 70, Time: 3 hours

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

Section A

1. a) Describe the general characteristics of an estuary? 3.0
b) Classify estuary on the basis of geomorphology. 4.0
2. a) Discuss how the crucial intertidal habitats including salt marsh and seagrass act as eco-engineering agents in coastal regions. 4.0
b) Draw a food web of: i) a mangrove ecosystem and ii) a salt marsh 3.0
3. a) Turbidity currents, submarine canyons, and continental rise are very much interrelated with each other in ocean bottom topography
i) How are they interrelated among each other? 1.0
ii) What are the mechanisms of the formation of submarine canyons? 1.5
iii) What is the impact of turbidity currents on ocean bottom topography? 1.0
b) Write down the single most important difference among the following terms: 0.5×7 = 3.5
i) Guyots and seamounts;
ii) Habitat and niche;
iii) Benthic fish and benthopelagic fish;
iv) Photoautotroph and chemoautotroph;
v) Hard coral and soft coral;
vi) Continental and oceanic crust;
vii) Estuary and marine environment.
4. a) In the coral reef ecosystem, coral and zooxanthellae algae are closely associated with each other
i) What is the ecological significance of such a close association? 1.0
ii) Under which condition such association is broken down? 1.0
iii) What is the ecological term used to denote when zooxanthellae are separated from the coral? 1.0
b) Briefly describe Darwin's subsidence theory regarding coral reef formation. 4.0
5. a) Why the epipelagic zone is very rich in biodiversity? 4.0
b) Write down special adaptations found in the many species of bathypelagic and abyssopelagic organisms to survive in the complete darkness environment. 3.0
6. a) What are the five steps of the nitrogen cycle in the marine environment? Briefly discuss the carbon cycle of the marine environment. 4.0
b) Describe briefly the geographical factors affecting the distribution of estuarine and marine communities. 3.0
7. Write short notes on **any two** of the following: 3.5×2 = 7.0
a) Migration of marine fishes, b) Upwelling, and c) Estuarine nutrient flux

Section B

8. a) Briefly describe the estuarine types based on water circulation. 3.0
b) How the estuary plays significant role in fisheries? 2.0
c) Enlist the intertidal and subtidal communities existing in coastal communities with examples. 2.0
9. a) Illustrate a typical marine bottom topography. 3.0
b) How is ocean acidification influencing the abundance and distribution of marine primary production? Discuss adaptation of phytoplankton to the changing of light intensity in marine environment. 4.0
10. a) Explain open ocean habitat and describe the major characteristics of open ocean habitat (Draw picture where necessary). 3.0
b) Marine fishes have a high adaptive capacity for surviving in the critical marine environment. Now describe the major adaptive features of marine fishes. 4.0
11. a) Coral is very much sensitive to environmental change. Discuss the environmental features required for coral growth. 2.0
b) Differentiate between seaweed and seagrass. 2.0
c) "Coral reef ecosystems become endangered day by day"- discuss the statement with a proper explanation. 3.0
12. a) "Mangrove habitat is considered one of the most important coastal habitats due to its biological and physical importance" - Justify the statement. 4.0
b) What are the causes of mangrove forest destruction in Bangladesh? 3.0
13. a) What do you mean by zoo-geological distribution? 2.0
b) Describe the geographical distribution of a commercially important marine fish species. 5.0
14. Write short notes on any two of the following: 3.5x2 = 7.0
a) Buffer zone, b) Hedal zone habitat, and c) ENSO

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B.Sc. Fisheries (Hons.) Year -1, Semester -2 (July-December), Final Examination, 2021

Course Code: **FWA-102 (T)**, Course Title: **Freshwater Aquaculture (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) Define aquaculture. Explain in details the types of aquaculture on the basis of farming system. 3
b) Write down the advantages and disadvantages of organic aquaculture. 4
2. a) What do you mean by water quality? 3
b) Name physical, chemical and biological water quality parameters of aquaculture pond. 4
3. a) Define water filtration process in a hatchery. 2
b) Discuss the function and uses of water filtration in shrimp hatchery. 5
4. a) What are the impacts of natural shrimp seed collection in context of Bangladesh? 2
b) Write down the principle of Integrated Multi-Trophic Aquaculture (IMTA). 5
5. a) What do you mean by biofouling in aquaculture? 3
b) Give an account on the impacts of pollutants of fish farm. 4
6. a) Write down the site selection criteria of a fish farm. 3
b) Illustrate the process of compost preparation for aquaculture use. 4
7. Write short notes on **any two** of the following: 3.5 x 2=7
a) Aquatic weeds; b) Integrated fish farming and c) Biofertilizer

Section B

8. a) Composite fish culture is advantageous over monoculture- do you agree or not? Justify your answer. 3
b) Differentiate between composite and integrated fish farming. 4
9. a) How do you determine the size of pond for fish farming? 2
b) Illustrate the reason of applying lime to a culture pond. 3
c) What are the causes of harmful algal blooms in fish pond? 2
10. a) What are the main factors that affect fish transportation? 3
b) List down 5 indigenous ornamental fish of Bangladesh with common and scientific name. 4
11. a) What do you know about broodstock management? List down the aspects to be considered for broodstock management. 3
b) Discuss the common problems of hatchery seeds in Bangladesh. 4
12. a) What do you know about pre and post stocking pond management? 2
b) Formulate a generalized feeding schedule for aquaculture. 5
13. a) Mention the characteristics of pond soil that are related with fish pond. 3
b) Discuss freshwater prawn culture technique with their specific management measures. 4
14. Write short notes on **any two** of the following: 3.5 x 2 = 7
a) Pen culture; b) Cage culture, and c) Organic aquaculture

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B. Sc. Fisheries (Hons.) Year -01, Semester-02 (July-December) Final Examination' 2021

Course Code: **ICH-102 (T)**, Course Title: **Ichthyology (Theory)**

Total Marks: 70

Time: 3 hours

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

Section-A

1. a) Define Ichthyology and Pisces. 2
b) How can you utilize the knowledge of Ichthyology in the fisheries sector of Bangladesh? 3
c) What is Dipnoi? Why the fish belonging to this order are unique? 2
2. a) Draw and label a typical cartilaginous fish. 2
b) Write at least three most notable features and two examples of each of the following orders: 5
i) Laminiformes; ii) Torpediniformes; iii) Perciformes; iv) Hexanchiformes, and v) Beloniformes
3. a) What do you mean by fish scale? 1
b) Mention the functions of fish scale. 2
c) Briefly explain the derivatives of fish skin. 4
4. a) Define and classify receptors. 2
b) Enumerate the function of receptor in fish. 2
c) Describe the structure of neuron with figure. 3
5. a) Mention the different parts of fish gill with their function. 3
b) Briefly describe the structure of gill pouch. 4
6. a) Define feeding adaptation. 1
b) How can you identify a predatory fish? 2
c) Discuss the feeding adaptation found in gill raker, mouth, and intestine of fishes. 4
7. Write short notes on **any two** of the following: 3.5 × 2 = 7
a) Thayer's principle; b) Living fossil; c) Weberian apparatus, and d) Pineal gland

Section-B

8. a) Illustrate the anatomical features of pectoral girdle of bony fish. 3
b) Discuss the skeletal muscle of fish trunk. 4
9. a) Differentiate between efferent and afferent artery. 2
b) What do you know about blood formation in different groups of fishes? 2
c) Briefly explain the hepatic portal system of *Cyprinus carpio*. 3
10. a) Write the name of excretory organs in fishes with their secreted products. 2
b) Differentiate between pronephric and mesonephric kidneys. 2
c) Show the schematic diagram of a glomerular nephron in a fish kidney. 3
11. a) What do you know about air tree? 1
b) 'Gas bladder is a sound producing organ'-explain. 2
c) Briefly describe the variations of swim bladder found in Latimaria, Chondrostei and Teleostei. 4
12. a) Why hypophysis is called the master gland? 1
b) Mention the major glands of endocrine system with their secretion and function. 6
13. a) What is electric organ of fish? 1
b) "Electric organ helps to maintain territory and sex recognition"- Justify. 2
c) How could fish produce electricity in aquatic environment? 4
14. Write short notes on **any two** of the following: 3.5 × 2 = 7
a) Fish heart; b) Siluriformes; c) Blood circulatory system, and d) Fish barbell