

**FIFTH SEMESTER U.G. DEGREE EXAMINATION, NOVEMBER 2021**

(CBCSS—UG)

Aquaculture

AQC 5D 01—VALUE ADDITION AND FISHERY BYPRODUCTS

(2019 Admissions)

Time : Two Hours

Maximum : 60 Marks

**Section A***Answer at least eight questions.**Each question carries 3 marks.**All questions can be attended.**Overall Ceiling 24.*

1. Kamaboko.
2. Sorbitol.
3. Gel strength.
4. Lobster tails.
5. Bowl chopper.
6. Pillowing.
7. Batter.
8. FPC.
9. Cooked marinades.
10. Chitosan.
11. Pink spoilage.
12. Botulism.

(8 × 3 = 24 marks)

**Section B***Answer at least five questions.**Each question carries 5 marks.**All questions can be attended.**Overall Ceiling 25.*

1. Classification of proteins in fish muscle.
2. Extraction and purification of fish oil.
3. Production of fish meal using wet reduction.
4. Fish outlet production.
5. Different kinds of breeding for coated products.

**Turn over**

6. Spoilage in dried fish products.
7. BIS quality standards for dried fish.

(5 × 5 = 25 marks)

### Section C

*Answer any one question.  
The question carries 11 marks.*

1. Explain the fish meal production process and equipments involved using a flow chart.
2. Significance of value addition in India.

(1 × 11 = 11 marks)

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**FIFTH SEMESTER U.G. DEGREE EXAMINATION, NOVEMBER 2021**

(CBCSS—UG)

Aquaculture

AQC 5B 13—AQUACULTURE ENGINEERING AND BIostatISTICS

(2019 Admissions)

Time : Two Hours

Maximum : 60 Marks

**Section A***Answer at least eight questions.**Each question carries 3 marks.**All questions can be attended.**Overall Ceiling 24.*

1. What do you mean by sedimentation ?
2. What are the merits and demerits of median ?
3. Expand BHP and write the formula for calculating BHP.
4. Write down the classification of aerators.
5. Define Frequency curve.
6. Write down the functions of compressors.
7. What is the difference between null hypothesis and alternate hypothesis ?
8. Define raceway system.
9. What you mean by dyke ?
10. Write short notes on the methods of representation of data.
11. Explain ranging in surveying.
12. Write a note on Gunter's chain.

(8 × 3 = 24 marks)

**Section B***Answer at least five questions.**Each question carries 5 marks.**All questions can be attended.**Overall Ceiling 25.*

13. Classify and write notes on surveying based on the nature of the field.
14. What are filters ? Write brief notes on types of filters used in fish culture.

**Turn over**

15. What do you mean by 'canal'? Write short on various types of canals.
16. Calculate mean, mean deviation and co-efficient of mean deviation for the following frequency distribution of marks of 60 college students :

Marks obtained	0-10	10-20	20-30	30-40	40-50	50-60	60-70
No. of students	4	6	10	20	10	6	4

17. Describe quartiles and its applications.
18. Write detailed notes on different types of pumps used in aquafarms.
19. A pond is to be dug with 15 m wide and 20 m long at the bottom to a depth of 2.5 m. If the side slope recommended is 1 in 1. Find the volume of earth work.

(5 × 5 = 25 marks)

### Section C

*Answer any one question.  
The question carries 11 marks.*

20. Write an essay on measures of central tendency.
21. Define chaining and types of instruments and chains used for chaining.

(1 × 11 = 11 marks)

**FIFTH SEMESTER U.G. DEGREE EXAMINATION, NOVEMBER 2021**

(CBCSS—UG)

Aquaculture

AQC 5B 12—BREEDING AND REARING OF AQUARIUM FISHES

(2019 Admissions)

Time : Two Hours

Maximum : 60 Marks

**Section A***Answer at least eight questions.**Each question carries 3 marks.**All questions can be attended.**Overall Ceiling 24.*

1. Redline torpedo barb.
2. Brackish water ornamental fishes of India.
3. *Carinotetraodon travancoricus*.
4. Protein skimmer.
5. Major requirements for a planted aquarium.
6. Marine Aquarium Council.
7. Syngnathidae.
8. Import quarantine.
9. Touch pool.
10. Symbiosis exhibited by clownfish.
11. Grading and sorting.
12. Java moss.

(8 × 3 = 24 marks)

**Turn over**

**Section B**

*Answer at least five questions.*

*Each question carries 5 marks.*

*All questions can be attended.*

*Overall Ceiling 25.*

13. Analyse the ornamental fish export sector in India.
14. What are the aquarium accessories needed for a reef aquarium ?
15. Sexual dimorphic characters of Goldfish and breeding setup.
16. Use of Moina in ornamental fish culture.
17. Describe the parental care in freshwater angelfishes.
18. What are the biosecurity aspects in an ornamental fish hatchery ?
19. Harvesting and packaging of ornamental fishes.

(5 × 5 = 25 marks)

**Section C**

*Answer any one question.*

*The question carries 11 marks.*

20. Role of developmental agencies in the ornamental fish sector of India.
21. Describe commercial propagation of *Poecilia reticulata*.

(1 × 11 = 11 marks)

**FIFTH SEMESTER U.G. DEGREE EXAMINATION, NOVEMBER 2021**

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Aquaculture

AQC 5B 11—FISHING METHODS

(2019 Admissions)

Time : Two Hours

Maximum : 60 Marks

**Section A (Short Answer Type Questions)***Answer at least **eight** questions.**Each question carries 3 marks.**All questions can be attended.**Overall Ceiling 24.*

1. Fish eye.
2. Dyneema.
3. Gorge.
4. Squid jigs.
5. Fish pumps.
6. *Batchari* boats.
7. ICAR CIFT TED.
8. High density floats.
9. Search and Rescue Transponders (SARTs).
10. Medina panel.
11. Sustainable fishing.
12. FRP.

(8 × 3 = 24 marks)

**Turn over**

**Section B**

*Answer at least five questions.*

*Each question carries 5 marks.*

*All questions can be attended.*

*Overall Ceiling 25.*

13. Acoustic methods of fish detection.
14. Passive fishing gears.
15. Yarn numbering.
16. Kelly's eye and stopper.
17. Ghost fishing.
18. Safety precautions during fishing.
19. Remote sensing for fish stock assessment.

(5 × 5 = 25 marks)

**Section C**

*Answer any one question.*

*The question carries 11 marks.*

20. Give an account of FAD. Enumerate technical aspects on setting, construction, deployment and maintenance of FADs.
21. Give a comparative account on the major types of boat building materials and their relative advantages.

(1 × 11 = 11 marks)



**FIFTH SEMESTER U.G. DEGREE EXAMINATION, NOVEMBER 2021**

(CBCSS—UG)

Aquaculture

AQC 5B 10—FISH PROCESSING TECHNOLOGY AND QUALITY CONTROL

(2019 Admissions)

Time : Two Hours and a Half

Maximum : 80 Marks

**Section A***Answer at least ten questions.**Each question carries 3 marks.**All questions can be attended.**Overall Ceiling 30.*

1. F-value.
2. Commercial sterility.
3. GMP and GLP.
4. Re-glazing.
5. *Salmonellosis*.
6. EIA.
7. SOP and SSOP.
8. Flake ice.
9. Cold spot.
10. Radurization.
11. Tempura batter.
12. Z-value.
13. Peroxide value.
14. Principle of freezing.
15. Mycotoxin.

(10 × 3 = 30 marks)

**Turn over**

**Section B**

*Answer at least five questions.*

*Each question carries 6 marks.*

*All questions can be attended.*

*Overall Ceiling 30.*

16. Principle of salting and types of salts.
17. Principle of drying and stages of drying fish.
18. Chemical methods of fish quality assessment.
19. Preparation of masmin.
20. Preparation of chitin.
21. Different types of cold storages.
22. Retort pouch and its advantages.
23. TFS can and its advantages.

(5 × 6 = 30 marks)

**Section C**

*Answer any two questions.*

*Each question carries 10 marks.*

24. Discuss on biotoxins associated with seafood.
25. Discuss the ingredients and steps involved in the canning of sardine.
26. Discuss on HACCP and its seven principles.
27. With the help of flow charts explain the preparation of Katsubushi.

(2 × 10 = 20 marks)

**FIFTH SEMESTER U.G. DEGREE EXAMINATION, NOVEMBER 2021**

(CBCSS—UG)

Aquaculture

AQC 5B 09—HATCHERY TECHNOLOGY OF AQUATIC ORGANISMS

(2019 Admissions)

Time : Two Hours and a Half

Maximum : 80 Marks

**Section A***Answer at least ten questions.**Each question carries 3 marks.**All questions can be attended.**Overall Ceiling 30.*

1. Pearl spot.
2. Conditioning.
3. Microalgae.
4. Decapsulation.
5. Eyestalk ablation.
6. MS222.
7. CIBA.
8. *Cyprinus carpio*.
9. Green tiger.
10. Kakabans.
11. *Epinephelus tauvina*.
12. Berried female.
13. Exotic carps.
14. Jar hatchery.
15. Pituitary extract.

(10 × 3 = 30 marks)

**Section B***Answer at least five questions.**Each question carries 6 marks.**All questions can be attended.**Overall Ceiling 30.*

16. Component of bivalve hatcheries.
17. Induced breeding methods used in Indian major carps.

**Turn over**

18. Chinese hatchery and it's working principles.
19. Seed production and nursery rearing of Scampi.
20. Criteria for site selection to construct a shrimp hatchery.
21. Collection and transportation of brooders.
22. Microalgal culture.
23. Broodstock management in seabass hatchery.

(5 × 6 = 30 marks)

### Section C

*Answer any two questions.  
Each question carries 10 marks.*

24. Induced breeding techniques used in seed production of marine finfishes.
25. Prospect of brackishwater shrimp seed production in Indian hatcheries.
26. Scope and present status of molluscan breeding in India.
27. Write on carp breeding and seed production systems.

(2 × 10 = 20 marks)

## FIFTH SEMESTER U.G. DEGREE EXAMINATION, NOVEMBER 2021

(CUCBCSS—UG)

Aquaculture

AQC 5D 01—ORNAMENTAL FISH CULTURE

Time : Two Hours

Maximum : 40 Marks

## Part A

*Answer all questions.*

Choose the correct answer :

1. Which type of filtration uses bacteria :

- (a) Biological. (b) Mechanical.  
(c) Chemical. (d) None of these.

2. The sex ratio for gold fish breeding :

- (a) 1 : 2. (b) 2 : 1.  
(c) 1 : 1. (d) 2 : 2.

3. Breeding traps are generally used for :

- (a) Gold fish. (b) Danios.  
(c) Livebearers. (d) None of these.

4. The eggs of gold fish are :

- (a) Adhesive. (b) Floating.  
(c) Buoyant. (d) None of these.

5. The device is used to add or remove water to an aquarium :

- (a) Siphon. (b) Filter.  
(c) Valves. (d) None of these.

(5 × 1 = 5 marks)

Turn over

**Part B**

*Write short notes on any five questions.*

6. Live feeds.
7. Biological filters.
8. Name any *two* Indigenous ornamental fishes of Kerala.
9. Nano aquarium.
10. Acclimatisation.
11. Name two popular tetras.
12. Artemia cyst.

(5 × 2 = 10 marks)

**Part C**

*Answer any three of the following in not more than two paragraphs.*

13. Preparation of breeding environment for Angel fish.
14. White spot disease.
15. The propagation and maintaining of aquarium plants.
16. Viral diseases of fishes.
17. Marketing strategies of ornamental fishes.

(3 × 5 = 15 marks)

**Part D**

*Write essays on any one of the following.*

18. Write an essay on setting up of freshwater aquarium and the problems involved in maintaining a freshwater aquarium.
19. Nutrition and preparation of aquarium fish feed of ornamental fishes.
20. Current status of ornamental fish trade in India.

(1 × 10 = 10 marks)

**FIFTH SEMESTER U.G. DEGREE EXAMINATION, NOVEMBER 2021**

(CUCBCSS—UG)

Aquaculture

**AQC 5B 11—FISHING METHODS, FISHERY BYPRODUCTS AND VALUE ADDED  
FISHERY PRODUCTS**

Time : Three Hours

Maximum : 80 Marks

I. Answer *all* questions. (One word / fill in the blanks/ multiple choices). 1 mark each :

- 1 The headquarters of CIFNET is in \_\_\_\_\_.  
(a) Chennai. (b) Cochin.  
(c) Hyderabad. (d) Mumbai.
- 2 Gaping is a quality problem in \_\_\_\_\_.
- 3 The choice gear for catching pelagic predatory fish is \_\_\_\_\_.
- 4 Mechanised fishing fleet constitute about \_\_\_\_\_ % of the total marine fishing fleet in India.  
(a) 75 %. (b) 50 %.  
(c) 80 %. (d) 24 %.
- 5 Deacetylated chitin is :  
(a) Chitinase. (b) Glucosamine.  
(c) Chitosan. (d) Carboxy methyl chitin.
- 6 The various constituent pieces of netting panels are assembled by \_\_\_\_\_.
- 7 An iron bar with wide angle attached to the wings of the trawl net through bridles to facilitate the vertical spread of the net is called \_\_\_\_\_.  
(a) Vertical rod. (b) Shackle.  
(c) Swivel. (d) Danleno.
- 8 Ideal pH for fish pickle should be \_\_\_\_\_.

**Turn over**

- 9 Highly localized corrosion on the metal surface is called \_\_\_\_\_.
- (a) Creviceing. (b) Gaping.  
(c) Pitting. (d) Leaching.

10 \_\_\_\_\_ is an active fishing gear.

(10 × 1 = 10 marks)

II. Answer any *five* questions. 2 marks each :

- 11 Cryoprotectants.  
12 Disadvantages of natural fishing gear materials.  
13 Sonar.  
14 Ghost fishing.  
15 Fish ensilation.  
16 BRD.  
17 Live bait fishery.

(5 × 2 = 10 marks)

III. Answer any *six* questions. 5 marks each :

- 18 Briefly explain the quality problems encountered during storage of fish mince.  
19 Importance of Fish Aggregating Devices.  
20 Give an account on the operation of a dol net.  
21 What are light assisted fishing systems ? Explain with a suitable example.  
22 Give an account of Squalene-its source, characteristics and uses.  
23 Outline the articles which encompass the FAO Code of Conduct for Responsible Fisheries.  
24 Outline the process of preparation of shark fin rays from shark fin.  
25 Briefly explain the major destructive fishing methods practiced in inland water bodies.

(6 × 5 = 30 marks)

IV. Answer any *two* questions. 15 marks each :

- 26 List the major value added products for export from the cultured shrimp *Litopenaeus vannamei*.  
Outline the steps involved in the preparation of frozen PD shrimp from whole shrimp.



- 27 Explain the different types of gill nets used in marine and inland fisheries.
- 28 Explain the basic steps involved in the commercial production of battered and breaded products with the help of a flow chart. What is an overflow batter applicator ?
- 29 Draw a design of a simple trawl net and mark the major parts. Give an account on the operation of a simple trawl net.

(2 × 15 = 30 marks)

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**FIFTH SEMESTER U.G. DEGREE EXAMINATION, NOVEMBER 2021**

(CUCBCSS—UG)

Aquaculture

AQC 5B 10—FISH PROCESSING TECHNOLOGY AND QUALITY CONTROL

Time : Three Hours

Maximum : 80 Marks

**Part A***Answer all questions.**Each question carries 1 mark.*

1. Which class of bacteria is most significant in spoilage of refrigerated seafood ?
  - (a) Halophile.
  - (b) Mesophile.
  - (c) Psychrotroph.
  - (d) Psychrophile.
2. The approximate ratio of ice to fish in the chilling process is \_\_\_\_\_ in the tropical climate.
  - (a) 1 : 40.
  - (b) 1 : 60.
  - (c) 1 : 3.
  - (d) 1 : 90.
3. Most of the temperature based food processing techniques are based on destroying one of the following bacteria and its spores in particular :
  - (a) *Salmonella*.
  - (b) *Clostridium botulinum*.
  - (c) *Staphylococcus*.
  - (d) *Bacillus cereus*.
4. The advantage of Refrigerated Sea-Water chilling is/are \_\_\_\_\_.
  - (a) Quicker cooling.
  - (b) Possibility of bulk chilling with low holding temperature.
  - (c) Reduced pressure on fish.
  - (d) All of the above.
5. Retort pouch is :
  - (a) Flexile metal-plastic laminate.
  - (b) Withstand pressure cooking.
  - (c) Suitable for packing ready to eat fish products.
  - (d) All of the above.

**Turn over**

6. Expand MIPQC.
7. \_\_\_\_\_ ice is manufactured by spraying water and freezing it on to the outer surface of a refrigerated plate to form a sheet of ice, which is usually released by an internal hot gas to defrost.
- (a) Block ice. (b) Tube ice.  
(c) Plate ice. (d) Flake ice.
8. Histamine is formed in the fish post mortem by biological decarboxylation of the amino acid \_\_\_\_\_.
9. Which of the following bacterium is associated with food intoxication ?
- (a) Staphylococcus. (b) Salmonella.  
(c) Campylobacter. (d) Vibrio parahaemolyticus.
10. Statement 1 : Pesticides are unintentionally added chemical hazards.  
Statement 2 : The whole fish or fillets frozen pre-rigour can give a better product.
- (a) True, True. (b) True, False.  
(c) False, True. (d) False, False.

(10 × 1 = 10 marks)

### Part B

*Give short notes on any five questions.*

11. What are the ways to prevent autolysis in fresh fish ?
12. Write four sensory quality indicators of whole fish.
13. Seafood toxins.
14. Super chilling.
15. SSOP.
16. Write the significance of F-value in canning preservation.
17. Explain the importance of 'Process Flow diagram' in HACCP program.

(5 × 2 = 10 marks)

**Part C**

Answer any **six** of the following in not more than **two** paragraphs.

*Each question carries 5 marks.*

18. Write a note on the quality changes occurring in fish during freezing.
19. Chlorination of ice and water.
20. Write a note on the various types of spoilage seen in canned seafood.
21. Seafood borne infections.
22. Fishery waste management.
23. Write briefly on the regulatory role of MPEDA in fishery export.
24. Describe 'Risk Assessment' in seafood processing.
25. Explain the principle of curing preservation of fish.

(6 × 5 = 30 marks)

**Part D**

Write essays on any **two** of the following.

*Each question carries 15 marks.*

26. Write an essay on :
  - (a) Methods for packaging of fish.
  - (b) Irradiation preservation methods.
27. Discuss the post-partem quality changes (organoleptic, sensory, physical, chemical and bacteriological) in fishes.
28. Explain important quality management programmes for the seafood industry.
29. Describe the consideration for frozen storage during export of fishery from India.

(2 × 15 = 30 marks)

## FIFTH SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2021

COURSE: (10)

Aquaculture

USE OF STATISTICS/ TECHNOLOGY OF AQUATIC ORGANISMS

(2014-2018 Admissions)

Time: 1 hour

Maximum: 80 Marks

## Part A

Answer all questions

Each question carries 1 mark

1. The backbone

- (a) makes up the support structure in each in
  - (b) is composed of the repetition of
  - (c) segments called vertebrae
  - (d) is composed of cartilage
- Answer is: Fish

2. A disease called Ichthyofobia

is a disease of fish. It was first used in

- (a) Brazil
- (b) China
- (c) USA
- (d) India

3. The body parts of bony fish which are

- (a) 1000-2000 kg/ha
- (b) 100-200 kg/ha
- (c) 10-20 kg/ha
- (d) None of these

4. Disease called Ichthyofobia

- (a) *Paratuberculosis*
- (b) *Paratuberculosis*
- (c) *Paratuberculosis*
- (d) None of these

9 *M.rosenbergii* attains first maturity in :

- (a) 4 - 7 month. (b) 10 months.  
(c) 12- 15 months. (d) None of these.

10 pH for carp culture :

- (a) 8 - 8.6. (b) 4 - 5.  
(c) 5 - 7. (d) 7 - 11.

(10 × 1 = 10 marks)

### Part B

Write short notes on any **five** questions.

Each question carries 2 marks.

- 11 Artemia cyst.  
12 Eugenol.  
13 Wet and dry bundhs.  
14 List down the criteria for selecting brood stock.  
15 Mouth brooders.  
16 Artificial fertilization.  
17 Name any *two* natural fish food organism.

(5 × 2 = 10 marks)

### Part C

Answer any **six** of the following in not more than **two** paragraphs.

Each question carries 5 marks.

- 18 Method of packing and transportation of carp seeds.  
19 Inducing agents in fish breeding.  
20 Seed production and nursery rearing of sea bass.  
21 Carp seed resources in major rivers.  
22 Types of bundh breeding techniques.

- 23 Mass culture of Artemia.
- 24 Nursery rearing of trout.
- 25 Quality assessment of seeds.

(6 × 5 = 30 marks)

#### Part D

*Write essays on any two of the following.*

*Each question carries 15 marks.*

- 26 Write about the status and scope of Aquaculture in present scenario.
- 27 Write an essay on hatchery design and construction.
- 28 Explain the carp breeding techniques and methods followed in China and India.
- 29 Describe the brood stock management of Shrimps.

(2 × 15 = 30 marks)

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