

SIXTH SEMESTER U.G. DEGREE EXAMINATION, MARCH 2022

Aquaculture

AQC 6B 24 (E2)—LIMNOLOGY AND OCEANOGRAPHY

(2019 Admissions)

Time : Two Hours

Maximum : 60 Marks

Section A

*Answer atleast **eight** questions.**Each question carries 3 marks.**All questions can be attended.**Overall ceiling 24.*

1. Compare *euphotic zone* and *disphotic zone*.
2. Upwelling.
3. Littoral zone.
4. Secchi disc.
5. Algal bloom.
6. Ichthyoplankton.
7. Compare *GPP* and *NPP*.
8. Placer minerals.
9. SOFAR Channel.
10. Ox-bow lakes.
11. Diatomaceous earth.
12. Compare *centrales* and *pennales*.

(8 × 3 = 24 marks)

Section B

*Answer atleast **five** questions.**Each question carries 5 marks.**All questions can be attended.**Overall ceiling 25.*

13. Ecological roles of benthos.
14. Explain vertical migration of zooplankton.
15. Comment on fresh water macrophytes with examples.

Turn over

16. Mud banks of Kerala.
17. Write a short note on ocean acidification.
18. What are the biotic and abiotic components of ecosystem ?
19. Comment on various oceanographic sampling equipments.

(5 × 5 = 25 marks)

Section C

*Answer any **one** questions.*

Each question carries 11 marks.

20. Write an essay on the ecological divisions of the sea. Explain the characteristics of each division.
21. Explain in detail about the ecosystem services and bio-diversity of mangroves.

(1 × 11 = 11 marks)

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SIXTH SEMESTER U.G. DEGREE EXAMINATION, MARCH 2022

(CBCSS—UG)

Aquaculture

AQC 6B 24 (E1)—FISH BIOCHEMISTRY AND NUTRITION

(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. Chitosan.
2. Pearson's square method.
3. Trypsin inhibitor.
4. Biological value.
5. EAAI.
6. DL Methionine.
7. Wheel animalcules.
8. Proximate composition.
9. Lipid peroxidation.
10. INFIC.
11. Scoliosis.
12. Nutrient digestibility.

(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. Quality standards of aquafeed.
14. Different forms of feed.
15. Feed storage and transportation.
16. Energy partitioning in fish.

Turn over

17. Non-conventional feed ingredients.
18. Extrusion technology and floating feed.
19. Lipids and fatty acids in fish.

(5 × 5 = 25 marks)

Section C

*Answer any **one** question.*

The question carries 11 marks.

20. Nutritional requirement studies in fish nutrition and importance.
21. Role additives in the qualitative development of feed, fish and environment.

(1 × 11 = 11 marks)

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SIXTH SEMESTER U.G. DEGREE EXAMINATION, MARCH 2022

(CBCSS—UG)

Aquaculture

AQC 6B 20—FISHERIES ECONOMICS AND EXTENSION

(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. Carp culture.
2. Tariff.
3. India's fishery export.
4. Middlemen.
5. Diseconomies of scale.
6. Consumer Equilibrium.
7. Shut down point.
8. PPC.
9. Implicit cost.
10. Marketing institutions.
11. Fish marketing.
12. Utility.

(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. Explain the concept of law of diminishing utility.
14. What are the importance of co-operative societies in the fishery sector ?
15. Discuss the different economic systems in operations.

Turn over

16. What do you know about the price determination of fishery products ?
17. Summarizes the basic principles of management.
18. Explain the concept of elasticity of demand.
19. What are the different methods of extension ?

(5 × 5 = 25 marks)

Section C

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

20. Discuss the concept of production function by citing the examples from fisheries.
21. Explain the methods of economic analysis of business organizations.

(1 × 11 = 11 marks)

SIXTH SEMESTER U.G. DEGREE EXAMINATION, MARCH 2022

(CBCSS—UG)

Aquaculture

AQC 6B 19—FISHERY MICROBIOLOGY

(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. Germ theory of disease.
2. Scanning electron microscope.
3. Protozoans.
4. Nitrogen fixing microbes.
5. Photoheterotrophs.
6. Differential media.
7. *Listeria monocytogenes*.
8. Water activity and fish spoilage.
9. Endospore.
10. Bacterial growth curve.
11. Bacterial classification based on temperature.
12. Lysogenic cycle.

(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. Contributions of Louis Pasteur, Koch and Winogradsky.
14. Bright field and Dark field microscope.
15. Structure of fungi and yeast cell.
16. Different culture techniques.
17. Effect of environmental factors on growth of bacteria.
18. Role of autotrophic and heterotrophic microorganisms in the culture pond.
19. Filter feeding and associated health risk with bivalve shellfish.

(5 × 5 = 25 marks)

Section C

*Answer any **one** question.*

The question carries 11 marks.

20. Discuss the spoilage microflora of fish and shellfish and the factors affecting spoilage.
21. Explain the role of microbes in biogeochemical cycles.

(1 × 11 = 11 marks)

SIXTH SEMESTER U.G. DEGREE EXAMINATION, MARCH 2022

(CBCSS—UG)

Aquaculture

AQC 6B 18—FISH PATHOLOGY AND HEALTH MANAGEMENT

(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. Significance of biofilm in maintaining water quality.
2. Larval mycosis in shrimps.
3. What is a Trophozoite ?
4. Shrimp bacterial diseases.
5. Differentiate vertical and horizontal disease transmission.
6. Life cycle of trematodes.
7. Mycoses in fishes.
8. Tail and fin rot.
9. Freshwater white spot disease.
10. Differentiate vertical and horizontal disease transmission.
11. Enteric Red Mouth disease.
12. Name any *two* disinfectants used for treating parasitic infections.

(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. Emerging diseases in aquaculture.
14. Nutritional diseases in fishes.
15. Biosecurity in aquaculture.
16. Parasitic diseases of shellfishes.
17. Epizootic ulcerative syndrome.
18. Viral diseases of finfishes.
19. Filamentous bacterial disease.

(5 × 5 = 25 marks)

Section C

Answer any one question.

The question carries 11 marks.

20. Describe the various health management strategies used in aquaculture and its significance.
21. Comment on the pathology and treatment of protozoan parasites of fishes.

(1 × 11 = 11 marks)

SIXTH SEMESTER U.G. DEGREE EXAMINATION, MARCH 2022

(CBCSS—UG)

Aquaculture

AQC 6B 17—FISH GENETICS, BIOTECHNOLOGY AND BIOINFORMATICS

(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. Mitochondria.
2. Nucleosome.
3. Prophase.
4. Co-dominance.
5. Mutagens.
6. Hybrid vigor.
7. Hermaphroditism.
8. Restriction Enzymes.
9. Cloning vectors.
10. Saxitoxin.
11. BLAST.
12. FAO.
13. Law of segregation.
14. Taq polymerase.
15. Trisomy.

(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. Difference between prokaryotic and eukaryotic cell.
17. Types of biological databases.

Turn over

18. Chromosome structure and types.
19. Complete, incomplete and co-dominance.
20. Sex determination in fishes.
21. Transgenic fish.
22. Cryopreservation.
23. Marine toxins.

(5 × 6 = 30 marks)

Section C

*Answer any **two** questions.*

Each question carries 10 marks.

24. Discuss about applications of biotechnological tools in aquaculture.
25. Write in detail about the types of mutations and mutagens.
26. Explain mitosis and its various stages with diagram.

(2 × 10 = 20 marks)

SIXTH SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION, MARCH 2022

Aquaculture

AQC 6B 20—FISHERIES ECONOMICS, BUSINESS ADMINISTRATION, EXTENSION
AND TOURISM

(2014 to 2018 Admissions)

Time : Three Hours

Maximum : 80 Marks

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

1. _____ deals with the creation, transmission & application of knowledge designed to bring about planned changes in the behavior-complex of people.
(A) Formal education. (B) Extension education.
(C) High-tech education. (D) Behavioral Education.
2. Indian economy is _____.
(A) Socialistic. (B) Mixed.
(C) Gandhian. (D) Free economy.
3. Goal or target to be achieved is known as _____.
(A) Schedule. (B) Budget.
(C) Procedures. (D) Objective.
4. The word "co-operation" derived from which language :
(A) German. (B) Latin.
(C) Italian. (D) Greek.
5. Marketing is a _____ activity.
(A) Goal oriented. (B) Social process.
(C) Exchange process. (D) All of these.
6. How do manufactures reach directly to customers ?
(A) Factory outlet. (B) Wholesalers.
(C) Independent retailers. (D) None of these.

Turn over

7. _____ is the act of increasing the knowledge and skills of an employee for doing a job.
- (A) Training. (B) Induction.
(C) Placement. (D) Orientation.
8. _____ means a process of stimulating people to action to accomplish desired goals.
- (A) Motivation. (B) Leadership.
(C) Communication. (D) None of these.
9. Economics is the study of _____.
- (A) How society manage its unlimited resources.
(B) How to reduce our wants until we are satisfied.
(C) How society manage its scarce resources.
(D) How to fully satisfy unlimited wants.
10. 5. What is the short form of Kerala State Co-operative Federation for Fisheries Development Ltd :
- (A) KSCFFFD. (B) MASTYAFED.
(C) KSMASTYAFED. (D) KSCMASTYAFED.

(10 × 1 = 10 marks)

Part B

*Write any five of the following questions.
Each question carries 2 marks.*

11. What is benefit cost ratio ?
12. What is discounting method ?
13. Distinguish between merchant middlemen and agent middlemen.
14. Write notes on market survey.
15. Comment on mixed economy.
16. What are the features of a registered company ?
17. Write notes on payback period.

(5 × 2 = 10 marks)

Part C

*Answer any six of the questions below.
Each question carries 5 marks.*

18. Define fisheries extension and briefly describe its importance and scope in fisheries.
19. Briefly describe about various types of management.

20. Briefly explain various methods of extension applicable to fisheries sector in Kerala.
21. Elaborate various requisites of a successful business.
22. Comment on identifying and selecting markets with regard to fisheries.
23. Briefly explain the theories of production.
24. Elaborate the components of a project report.
25. Prepare cost and earnings of a shrimp hatchery.

(6 × 5 = 30 marks)

Part D

Answer any two of the following questions.

Each question carries 15 marks.

26. Write an essay on the socio-economics condition of fishermen in India and Kerala.
27. Write an essay on the present status and future prospects of recreation fishing in economic growth and fish conservation in Kerala.
28. Describe in detail about the methods of economic analysis of business organizations.
29. Describe various functions of managements.

(2 × 15 = 30 marks)

SIXTH SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION, MARCH 2022

Aquaculture

AQC 6B 19—FISHERY MICROBIOLOGY

(2014 to 2018 Admissions)

Time : Three Hours

Maximum : 80 Marks

Part A*Answer all questions.*

1. Lichens are associations of———.
 - (a) Algae and bacteria.
 - (b) Algae and protozoans.
 - (c) Algae and fungi.
 - (d) Algae and viruses.
2. Microorganisms living in a microbial community have the benefit of———.
 - (a) Increased metabolic efficiency.
 - (b) Antimicrobial resistance.
 - (c) Protection from host defense.
 - (d) All of the above.
3. Which of the following growth phase is characterized by the induction of new enzymes that to use available nutrients in the medium ?
 - (a) Lag phase.
 - (b) Log phase.
 - (c) Stationary phase.
 - (c) Death phase.
4. Write any one advantage of the phase-contrast microscope.
5. Degree of scattering in transmission electron microscope is a function of———.
 - (a) Wavelength of the electron beam.
 - (b) Vacuum in the column.
 - (c) Number and mass of atoms that lie in the electron path.
 - (d) Strength of electromagnetic lenses.
6. Selective medium for *E. coli* is———.
 - (a) Mac Conkey Agar.
 - (b) Brain heart infusion agar.
 - (c) Baird Parker Medium.
 - (d) EMB medium.

7. Some organisms can use reduced inorganic compounds as electron donors and are termed as _____.
- (a) Lithotroph. (b) Chemotrophs.
(c) Organotrophs. (d) Photo-organotroph.
8. The spike-like projections on the viral capsid are known as :
- (a) Viriod. (b) Proteomes.
(c) Peplomers. (d) Capsomeres.
9. Name one intrinsic factor affecting spoilage of food :
10. Conversion of nitrates to nitrogen is called _____.
- (a) Ammonification. (b) Nitrification.
(c) Nitrogen fixation. (d) Denitrification.

(10 × 1 = 10 marks)

Part B

*Write short note on any **five** of the following questions.*

11. What do you mean by microbial consortium ?
12. Write the significance of endospore formation in Bacteria.
13. Write a short note on the phases of the bacterial growth curve.
14. Write on the protozoal infections in aquaculture systems.
15. Write a note on water activity.
16. Explain the significance of the depuration of bivalves.
17. Explain the procedure of pour-plate method.

(5 × 2 = 10 marks)

Part C

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

18. Mention the contributions of Sergei Winogradsky.
19. Write down the general characteristics of viruses.
20. Differentiate Eukaryotic and Prokaryotic cells.
21. What do you mean by serial dilution and plating of sediment samples for enumeration of bacteria ?

22. Explain the stages of the life cycle of lysogenic bacteriophage.
23. Briefly explain the allochthonous flora of culture ponds.
24. How can we control pathogenic *Vibrio* infections ?
25. Comment on storage atmosphere and its effect on food spoilage.

(6 × 5 = 30 marks)

Part D

Write essays on any two of the following.

26. Write an essay on the contributions of Robert Koch for the development of the field of Microbiology.
27. Briefly explain the role of the microbes in the nitrogen cycle.
28. Write a brief note on : a) Characteristics of different phases of the growth curve. b) Factors affecting the growth of bacteria
29. Give an account of the biology and epidemiology of pathogenic bacteria in aquaculture systems.

(2 × 15 = 30 marks)

**SIXTH SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION
MARCH 2022**

Aquaculture

AQC 6B 18—FISH PATHOLOGY AND HEALTH MANAGEMENT

(2014 to 2018 Admissions)

Time : Three Hours

Maximum : 80 Marks

Part A

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

I. Name the following :

- 1 B12 vitamin.
- 2 Vitamin C.
- 3 IHNV.
- 4 CCVD.
- 5 One mineral deficiency disease of fish.

II. Fill in the blanks :

- 6 The deficiency of _____ Vitamin causes “Black Death” in Shrimps.
- 7 _____ is an ectoparasite known as “fish louse”.
- 8 _____ causes Edwardsiellosis in fishes.
- 9 _____ causes Columnaris.
- 10 Costiasis is caused by _____.

(10 × 1 = 10 marks)

Part B

*Write short notes on any five questions.
Each question carries 2 marks.*

11. Write notes on Gregaria disease.
12. Comment on Luminous vibriosis in shrimp.

Turn over

13. What is eco-friendly aquaculture ?
14. What is Lagenidium disease ?
15. Comment on EUS.
16. Write notes on the symptoms of White Spot disease of shrimps.
17. What is dropsy ? Mention about its causative 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. Briefly describe about major CCVDS and baculovirus diseases.
19. Discuss about the role of environmental and genetical factors in inducing various diseases in cultured fishes and shell fishes.
20. Write detailed notes on the aetiology, symptoms and management of brown spot and white spot diseases in shrimp.
21. Describe about various protozoan diseases among shrimps in hatchery and farming phase.
22. How the use of probiotics helps in management of health among cultured organisms ?
23. Discuss about the significance of zero exchange culture system in management of diseases in aquaculture.
24. Explain the preventive methods and prophylaxis against the occurrence of fish and shrimp diseases.
25. Explain about the immune detection through DNA and RNA techniques.

(6 × 5 = 30 marks)

Part D

Write essays on any two of the following.

Each question carries 15 marks.

26. Write an essay on the bacterial diseases of fishes and their aetiology, disease management and prevention.
27. Write an essay on the application of development of vaccines, diagnostic tools which help in managing various diseases in aquaculture.
28. Describe in detail about the vitamin and mineral deficiency disease.
29. Discuss about the good pond management practices and eco-friendly and sustainable aquaculture.

(2 × 15 = 30 marks)

**SIXTH SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION
MARCH 2022**

Aquaculture

AQC 6B 17—FISH GENETICS, BIOTECHNOLOGY AND BIOINFORMATICS

(2014 to 2018 Admissions)

Time : Three Hours

Maximum : 80 Marks

Part A

Answer all questions.

Each question carries 1 marks.

I. Name the following :

- 1 Fisheries database.
- 2 Example of one transgenic fish.
- 3 Scientific name of one Peral producing mollusc.
- 4 Probiotic used in aquaculture.
- 5 Molecular visualization tool.

II. Match the following :

- | | | |
|-----------|---|---------------------------------|
| 6 BLAST | — | (a) Protein data base |
| 7 DDBJ | — | (b) Transcriptomics. |
| 8 CLUSTAL | — | (c) Drug discovery. |
| 9 PDB | — | (d) Multiple sequence analysis. |
| 10 CADD | — | (e) Nucleotide database. |
| | — | (f) Pair wise sequence analysis |

(10 × 1 = 10 marks)

Part B

Write short notes on any five questions.

Each question carries 2 marks.

- 11 What are supplementary and complementary genes ?
- 12 What is cloning ?

Turn over

- 13 What is hybrid vigor ?
- 14 What are probiotics ?
- 15 What are the different types of cryopreservation methods.
- 16 What are marine toxins ?
- 17 What is mono-sex population and mention its importance in aquaculture.

(5 × 2 = 10 marks)

Part C

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

Each question carries 5 marks.

- 18 Briefly describe the structure of chromosomes.
- 19 Comment on the scope and production of triploid and polyploid fishes.
- 20 Explain the determinant of DNA replication.
- 21 Write notes on the types of synthetic hormone, its production methods and uses in induced breeding.
- 22 Describe the importance of proteomic studies.
- 23 Briefly explain the sequence alignment types and tools used for it.
- 24 Comment of fisheries databases.
- 25 Write brief account on molecular docking and computer aided drug discovery.

(6 × 5 = 30 marks)

Part D

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

Each question carries 15 marks.

- 26 Write an essay on the classification of fish genetics.
- 27 Describe the relevance of biological data bases.
- 28 Write an essay on the scope of marine biotechnology.
- 29 Explain detail about the genetics of sex determination in fishes and prawns.

(2 × 15 = 30 marks)