Chattogram Veterinary and Animal Sciences University, Chattogram
Faculty of Fisheries
B. Sc. Fisheries (Hons.) Year -4 Semester-1, Final Examination' 2019
Course No: **401 (T)**, Course Title: Algal Biotechnology **(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) (a) Explain the status and prospects of algae culture in Bangladesh — 4
   b) (b) Explain types of algae and their suitable habitats — 3

2. a) Differentiate between 'micro- and macro' algae. Why seaweed belongs to Protista kingdom? — 3
   b) Discuss the history of seaweed culture and its current status in international trade. — 4

3. a) List down 6 (six) commercially important seaweed species (scientific name) popularly culture in sea-nations. — 3
   b) Write the culture technology of *Porphyra* spp. Commercially practiced in Japan. — 4

4. a) What is axenic culture? How will you obtain clean tissue from axenic culture? — 3
   b) Give a brief overview on *in-situ* seaweed culture. Write down the important factors to be considered during seaweed culture in laboratory condition. — 4

5. a) What is the composition of PES medium? Write the challenges of seaweed culture. — 3
   b) Describe the life cycle of Kelp (*Laminaria* spp.). — 4

6. a) Name 2 (two) seaweeds are enriched with agar content? What are the uses of agar? — 3
   b) Give detail processing protocol of agar from seaweed. — 4

7. Write down short notes (**any TWO**) on following: i) Phyto-remediation; (ii) Blue economy. — 3.5 X 2 = 7

Section B

8. a) (a) What do you mean by harmful algal bloom? Write in brief the main types of algae which can form into harmful algal blooms. — 3.5
   b) (b) Write in brief the major causes of algal blooms. — 3.5

9. a) What do you know about algal metabolites? Differentiate primary and secondary metabolites. — 3
   b) Draw and label a schematic diagram of *Undaria pinnatifida*. Write the key characteristics of red algae. — 4

10. a) What do you mean by renewable energy? How algae can be a potential source of renewable energy? — 3
    b) Describe the extraction procedure of bio-fuel from algae. — 4

11. a) Explain the term nutraceutical'. 'Write the importance of micro-algae in pigmentation of marine organism. — 3
    b) How will you extract fucoidan from seaweed? Write the beneficial effects of fucoidan. — 4

12. a) What is algal toxin? Enlist the 5 (five) toxic compounds derived from algae. — 3
    b) Which algae is responsible for red tide' bloom in the ocean? Give a possible solution if an area in the Bay of Bengal is bloomed with 'red tide'. — 4

13. a) Seaweed can be a useful source of nutrients for human being ~explain. — 3
    b) Give a brief overview on prospects of seaweed culture and its potential uses in Bangladesh. — 4

14. Write down short notes (**any TWO**) of the following: — 3.5x2=7
    i) Prospect of dietary supplement of microalgae; (ii) Antimicrobial activities of micro algae ; (iii) Prospects of marine algae as source of dietary fiber; (iv) Value added products from microalgae

Chittagong Veterinary and Animal Sciences University, Chittagong
Faculty of Fisheries
B. Sc. Fisheries (Hons.) Year -2 Semester-1, Final Examination' 2019
Course No: PAH **401 (T)**, Course Title: **Population Approaches in Aquatic Animal Health and Production (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 GIS? — 2.0
   b) Specify the major components of the GIS. — 2.0
   c) Illustrate the process of representing specific information in marine fisheries using different environmental parcels including land, ocean and atmosphere. — 3.0

2. a) Give an extended definition of RS? Briefly describe the energy sources in RS. — 4.0
   b) Briefly describe data collection techniques in RS. — 3.0

3. a) What's the significance of map projection in GIS? — 2.0
   b) Specify the metric properties of the maritime mapping. — 2.0
   c) How do you calculate latitude and longitude properties using Universal Transverse Mercator (UTM) in the marine fishing areas? - Illustrate this process. — 3.0

4. a) Define Multispectral image classification — 2.0
   b) Discuss briefly the basis for classifying an image of maritime space collected from Satellite Landsat 8. — 2.0
   c) What are the sources and types of error observed in remote sensing study especially in maritime field? — 3.0

5. a) How do Satellites make measurement? — 2.0
   b) Explain the basic processes and functionality of Remote sensing. — 3.0
   c) "A picture is worth a thousand Words"- Justify the statement in the field of Satellite Data representation. — 2.0

6. a) What do you understand by vector and raster model? — 2.0
   b) Briefly discuss point, lines and polygon features of vector data with example. — 5.0

7. Write down short notes on followings (Any Two): — 3.5 X 2 = 7
   (i) Active vs. passive RS; (ii) Mercator projection; (iii) Satellite types; (iv) Atmospheric windows.

Section B

8. a) What do you mean by Datum and MSL? — 3.0
   b) Define Geoid. What's the local ellipsoid consider for maritime region along with Bay of Bengal? — 2.0
   c) "The earth shape is irregular- Positioning needs simplification"- Justify the statement with relevant explanations and examples. — 2.0

9. a) Differentiate between spatial entity and objects. — 2.0
   b) "GIS in Marine Fisheries deal with spatial data with digital format"- clarify the sense of spatial data in that statement? — 3.0
   c) Discuss briefly the process of the spatial data interpret in maritime sector with proper example. — 2.0

10. a) What do you mean by DEMs? How can you represent this spatial modeling? — 3.0
    b) What's the significance of triangulation process in case of DEMs? — 2.0
    c) "Avoid the small angles, consider the bigger angles"- Justify the statement in TINs. — 2.0

11. a) How can you specify Fish Habitat mapping? — 1.0
    b) How marine habitats are mapped and integrated in Mapping process? — 3.0
    c) Illustrate the process of marine habitats mapping for Bangladesh Maritime Region using various applicable tools. — 3.0

12. a) What is geometric and radiometric correction? — 3.0
    b) "Remote sensing largely concerned with reflected radiation"- Explain the statement — 4.0

13. a) How spectral signatures initiate the image interpretation as well as image classification. — 3.0
    b) Illustrate the application of RS in the spatial distribution of natural resources in any offshore island of Bangladesh. — 4.0

14. Write down short notes on followings (Any Two): — 3.5 X 2 = 7
    (i) Aerial photography; (ii) LCC, (iii)Ground trothing; (iv) Triangulations in GPS.

*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 endocrinology. 1
    b) Write down the importance of studying endocrinology in fisheries science. 3
    c) Diagrammatically show the location of different endocrine glands in fish. 3

2. a) What is hormone? 1
    b) What are the classes of hormones? 2
    c) Mention the names of anterior pituitary hormones along with their functions. 4

3. a) Make a comparison between fish and human endocrine systems. 2
    b) What do you mean by cell to cell signaling? Describe the cell signaling process with appropriate figure. 5

4. a) Enlist the endocrinological disorders found in aquatic vertebrates. 2
    b) How do ghrelin and leptin hormone work in the animal body? 3
    c) Differentiate between endocrine and exocrine glands. 2

5. a) Classify receptors. 2
    b) Diagrammatically show the signal transduction process in cell. 2
    c) Explain the mechanism of G-protein coupled receptors. 3

6. a) What is chemical messenger? 1
    b) Write down the name of the chemical messengers with two examples from each. 2
    c) Diagrammatically show the mechanism of hormone release in a fish body. 4

7. a) What is neurosecretion? 1
    b) Classify neurotransmitters with example. 2
    c) Write down the roles of serotonin and dopamine in fish body. 4

Section B

8. a) Classify nervous system. 2
    b) Draw a labelled diagram of neurosecretory cell. 2
    c) Differentiate between spermatogenesis and oogenesis. 3

9. a) What are the stages of oocyte maturation in teleost fish? 2
    b) What is vitellogenin? Diagrammatically show the vitellogenesis process in fish. 3
    c) What do you know about gymnoovarian and cystovarian types of fish ovary? 2

10. a) What do you know about testosterone? 2
    b) Briefly describe the hormonal regulation of spermatogenesis in eel testis? 5

11. a) 'Dopamine is a special neurotransmitter'-explain. 3
    b) Describe the autonomic innervations process of hormone secretion in pancreas. 4

12. a) What do you know about steroid hormone? 2
    b) Explain the steroid hormone synthesis and release with diagram. 5

13. a) Define hypophysis. 1
    b) Write down the name of the adenohypophyseal cells. 2
    c) How is the GH synthesized, secreted and transported in blood? 4

14. Write down short notes on any **02 (Two)** of the following: 3.5 × 2 = 7
    i) HPA axis; ii) Negative feedback; iii) Gonadotropin.

Chattogram Veterinary and Animal Sciences University, Chattogram
Faculty of Fisheries
B. Sc. Fisheries (Hons.) Year -4 Semester-1, Final Examination' 2019
Course No: QFC **401 (T)**, Course Title: Quality Control of Fish and Fishery Products **(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 quality, Quality Control and Quality Assurance.   2
    b) Explain three aspects of quality.   2
    c) Write in brief causes of quality deterioration in fish.   3

2. a) Distinguish between food infection and food intoxication.   1
    b) Write in brief the factors influencing the intrinsic quality of fish.   2.5
    c) Explain briefly assessment of fish quality by determining organoleptic aspects of defect points of ice stored fish.   3.5

3. a) Explain briefly the organization of Competent Authority of fish and fishery products of Bangladesh for official control (organogram of FIQC).   4
    b) Write down briefly the major inspection activities of FIQC of Bangladesh.   3

4. a) Explain the components of traceability system in shrimp value chain in Bangladesh.   2
    b) Enumerate some movement documents which are used by stakeholders in fish supply chain for maintaining traceability records.   5

5. a) Write down the organogram of FIQC.   3
    b) Enumerate the inspection activities of FIQC.   2
    c) What are the pre-requisites for issuing health certificate of shrimp for export?   2

6. a) Write down briefly FDA Eight Key sanitation conditions and practices in food processing establishment.   3.5
    b) What is GMP? Write down briefly the standard operating procedure of a fish processing industry.   3.5

7. a) Differentiate between standard and specification.   2
    b) Mention the name of 5 (five) national and 5 (five) international standard organizations.   2
    c) Write down the quality management principles of ISO 9000 series.   3

Section B

8. a) Write in brief preliminary steps in developing a HACCP plan.   3.5
    b) Write in brief where CCPs can be steps in the process flow where hazards can be prevented, eliminated and reduced to acceptable level.   3.5

9. a) What is hazards? Identify species and process related hazards in fish fishery products   3.5
    b) Prepare a risk-based hazard analysis worksheet for IQF hilsha fish in receiving where histamine is a potential hazard.   3.5

10. a) What kind of sensory changes occur in fish after death?   2
    b) List down 2 (two) spore forming and 2 non0spore forming bacteria.   2
    c) Discuss the instrumental method of quality assessment of fish.   3

11. a) Write in brief quality problems in fish and fishery products.   3
    b) Write down briefly two biochemical methods to assess the quality of fish.   4

12. a) Write down briefly hygiene requirement in primary production   3.5
    b) Write in brief conditions and facilities required for depots/auction center in supply chain.   3.5
13. a) Write ~~down briefly hygiene requirement in primary production.~~ in brief the importance of quality assurance in fish and fishery products.   3.5
    b) Write in brief ~~conditions and facilities required for depots/auction center in supply chain.~~ the importance of inspection in the utilization of fishery resources.   3.5
14. Write down short notes **(any TWO)** of the following: 3.5 X 2 = 7
        i)End product specification of fishery products; (ii) SOP of a fish processing establishment;
        (iii) Maintaining raw material quality; (iv) CODEX.

Chittagong Veterinary and Animal Sciences University, Chittagong
Faculty of Fisheries
B. Sc. Fisheries (Hons.) Year -2 Semester-1, Final Examination' 2019
Course No: MRE**401 (T)**, Course Title: **Mangrove Resources (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 is mangrove vegetation?   2.0
    b) Briefly describe the ecological and physiological characteristics of mangroves.   3.0
    c) Describe the factors responsible for the development of mangroves.   2.0

2. a) "Mangrove has some unique characteristics which make them distinct from other plant species"- justify the statement.   3.0
    b) Explain the different ecosystem services provided by mangrove ecosystem.   2.0
    c) How mangrove resources of Sundarban contribute in national economy.   2.0

3. a) Illustrate the settling mangrove through various geological processes.   4.0
    b) Describe the mechanism through which mangrove can survive in critical saline water condition.   3.0

4. a) What do you understand by Reserve Forest?   2.0
    b) "Protected area is an important management tool"- explain the statement.   2.0
    c) Develop your own plan with recommendation for sustainable management of Sundarban mangrove forest.   3.0

5. a) Mention the key features of mangrove fisheries.   2.0
    b) Explain the economic importance of mangrove fisheries in Bangladesh.   2.0
    c) What are the hydro-ecological factors affecting the fisheries diversity in mangrove area?   3.0

6. a) Draw the general pattern of plant succession in different parts of the Sundarban.   3.0
    b) Explain the mangrove zonation on the basis of salinity   3.0
    c) Enlist the major hydrological zones of Sundarban.   1.0

7. Write down short notes on followings (Any Two):
    (i) Blue Carbon;   (ii) Mangrove tourism;
    (iii) Protected area management; (iv) Environmental impacts on Sundarban

Section B

8. a) Differentiate between red and black mangroves.   2.0
    b) Briefly mention the ecological zonation of SRF with name of characteristics species.   2.0
    c) Discuss about the dominant species in the saline zone.   3.0

9. a) "Viviparity is an especial kind of adaptation"- Explain the statement.   2.0
    b) Illustrate the different types of aerial roots with their functions.   5.0

10. a) Illustrate the major aspects and process of mangrove management plan.   4.0
    b) Enlist different national policy related to coastal aquaculture and environmental protection.   3.0

11. a) Explain ecologically critical areas (ECAs) and protected areas.   2.0
    b) What are the threats to mangrove protected areas of Bangladesh?   2.0
    c) Briefly discuss about the programs for natural resources conservation of Bangladesh.   3.0

12. a) What do you mean by restoration and rehabilitation?   2.0
    b) Explain the mangrove resource restoration strategy in Bangladesh.   3.0
    c) "Research is an important management tool"- Justify the statement.   2.0

13. a) "Mangrove ecosystem acts as a heaver for both plants and animals especially for aquatic resources"- justify the statement.   3.0
    b) Illustrate different types of mangrove based on physiognomy.   4.0

14. Write down short notes on followings (Any Two):   3.5 X 2 = 7
    (i) NWFP of Sundarban;   (ii) Mangrove restoration,
    (iii) Aquaculture and mangrove; (iv) Function of pneumatophore.

Chattogram Veterinary and Animal Sciences University, Chattogram
Faculty of Fisheries
B. Sc. Fisheries (Hons.) Year -4 Semester-1, Final Examination' 2019
Course No: **FRP 401 (T)**, Course Title: **Fisheries Research and Planning (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) Distinguish between research process and research purpose. — 3
    b) Sketch Barnett's general schema of the research process. — 4

2. a) Mention the common statistical tests used in fisheries biology. — 3
    b) Describe briefly an observational study as an example. — 4

3. a) Define sampling and sampling error. — 3
    b) Distinguish between standard deviation and standard error. — 4

4. a) What is applied research? Explain with example. — 1
    b) How can you obtain objectives for any fisheries research? — 3
    c) Define $Z\alpha$ notation. Write down its application with the help of a curve. — 3

5. a) What does the method of data analysis in a research depend on? — 2
    b) Why do you check your research findings against original model? — 2
    c) Obtain large sample confidence interval for a population mean algebraically. — 3

6. a) "Abstract is called mini-version of a scientific paper."Explain. — 2
    b) What are the suggested rules for writing a good introduction of a thesis? — 3
    c) Why using census is impractical in biological research? — 2

7. a) Differentiate "Project Monitoring" and "Project Evaluation". — 2
    b) How do you define authorship in your scientific manuscript? — 1
    c) Enlist the sources of confusion in an experiment with their minimizing measures. — 4

Section B

8. a) Why is participatory research necessary in fisheries? — 3
    b) Make a list of field data collection methods. — 4

9. a) Define SWOT. — 2
    b) Give a description of SWOT analysis of a project. — 5

10. a) What is Student's t-distribution? — 1
    b) Differentiate "normal curve" and "standard normal curve". — 2
    c) The mean of a random sample of 80 new motor bikes of Harley Davidson bike manufacturing company in USA is 209 in thousand dollars. Obtain a 95.44% confidence interval for the mean price of all new motor bikes. Assume the population standard deviation of the prices is $18740. — 4

11. a) Discuss the limitations of observational studies with an example. — 3
    b) Why planning in research is mandatory? — 2
    c) Write down the purpose of using maps in socio-economic assessment. — 2

12. a) What is model formulation? — 1
    b) How will you discuss your findings in a thesis? — 3
    c) Why determining areas between two z-values is important? — 3

13. a) What is non-parametric method? 1

 b) Name a problem by which it can be solved. What does it leads to? 3

 c) To estimate a population mean for having a size of minimum 30, what will be your suggestion? 3

14. a) What is package technology? 1

 b) Differentiate null hypothesis and alternative hypothesis. 2

 c) The American Fisheries Society collected information on the retail prices of their textbook- *Methods for Fish Biology* by C.B. Schreck and P. B. Moyle and published on their online portal sold in different countries in US dollars in 2016. The mean retail prices of that book was $ 58.62 with a standard deviation $5.98. Suppose that we want to perform a hypothesis test to decide whether this year's mean retail price of that textbook has increased from the 2016 mean sold in different countries. The mean retail prices from a 60 random samples of that book is $59.85. Use a 5% level of significance (Critical Value- 1.645) 4

Chattogram Veterinary and Animal Sciences University, Chattogram
Faculty of Fisheries
B. Sc. Fisheries (Hons.) Year -4 Semester-1, Final Examination- 2019
Course No: **FEX-401 (T)**, Course Title: **Fisheries Extension (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 extension and agricultural extension.   3
   b) Enlist the principles of agricultural extension.   4

2. a) Define learning. Enlist the elements of learning process.   3
   b) State the law of exercise with its implications in fisheries extension work.   4

3. a) What is innovation? Enlist the perceived attributes of fisheries innovations.   3
   b) Discuss the stages in the innovation-decision process with neat diagram.   4

4. a) Define communication. What are the key elements of a communication process?   3
   b) Write down the characteristics of a good message.   4

5. a) Define motivation.   2
   b) Discuss Maslow's need theory of motivation with its implication in fisheries extension work.   5

6. Write down short notes on the followings:
   a) Socialization and personality.   3.5
   b) Motivation cycle.   3.5

Section B

7. a) Define organization with examples.   2
   b) Write down the qualifications and duties of UFO of the Department of Fisheries.   5

8. a) Define leadership. Mention the importance of leadership in fisheries extension.   3
   b) Outline different types of leadership with examples.   2
   c) Write down the qualities of a good leader.   2

9. a) Define extension programme planning.   2
   b) State the different steps of extension programme planning.   5

10. a) What do you mean by philosophy of agricultural extension?   2
    b) Enumerate the philosophies of agricultural extension work and discuss in brief any one of those   5
       philosophies.

11. a) Define monitoring.   2
    b) Differentiate between monitoring and evaluation.   5

12. a) Write down the role of rural women in fisheries development in Bangladesh.   4
    b) State the needs of rural youth.   3

*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 molecular biology and biotechnology.   1
    b) Justify the significance of studying molecular biology and genetic engineering in fisheries.   2
    c) Explain how the knowledge of molecular biology and genetic engineering can enhance sustainability of   4
       Fisheries sector.

2. a) Describe the functions of restriction endonucleases.   2
    b) Enlist five restriction endonucleases with their source, cutting site with the indication of number of   5
       base cutter and cutting sequences.

3. a) What is PCR? Write the principle of PCR.   2
    b) Explain the procedural steps of PCR with example.   5

4. Discuss in details the construction and screening of cDNA library.   7

5. a) What is meant by dominant and co-dominant marker?   2
    b) Write the principle of RFLP marker. Mention advantages and disadvantages of RFLP marker.   5

6. a) What is recombinant DNA? Write the applications of recombinant DNA.   2
    b) Explain how would you create and screen recombinant DNA.   5

7. a) What is blotting? Mention the blotting techniques with their purpose.   2
    b) Write the principle of Western blotting. Mention its applications.   3
    c) Differentiate between Southern blotting and Western blotting.   2

Section B

8. a) What is molecular marker? Make a list of molecular markers widely used in fish genetic study.   2
    b) How will you use molecular markers in genetic study and conservation of fish population?   5

9. a) Define electrophoresis. Write the principle of gel electrophoresis.   3
    b) What are the factors affecting migration of nucleic acids during electrophoresis?   2
    c) Write the functions of agaorose gel, sodium dodecyl sulphate, ethidium bromide in electrophoresis.   2

10. a) Differentiate transient transformation from stable transformation of gene.   2
    b) Explain the methods of bacterial transformation and retroviral transduction.   5

11. a) List the artificial methods of DNA transfer.   2
    b) Describe the principle of electroporation and microinjection with their advantages and disadvantages.   5

12. a) Define the following terms: exon; promoter and enhancer.   2
    b) Illustrate the general features of a eukaryotic protein coding gene.   5

13. a) What is meant by gene expression and why regulation of gene expression is necessary?   1
    b) Mention the steps at which expression of a gene is regulated.   2
    c) Explain the mechanism of post-transcriptional regulation of gene expression.   4

14. Write down short notes on any **02 (Two)** of the following: 3.5 × 2 = 7
    i) Mobile genetic elements; ii)) Cloning vectors; iii) Southern blotting