

Chittagong Veterinary and Animal Sciences University, Chittagong
Faculty of Fisheries

B. Sc. Fisheries (Hons.) Year-03 Semester 01, Final Examination' 2016

Course code: **SFB-301(T)**, Course Title: **Shellfish Biology (Theory)**

Total Marks: 70, Time: 3 hours

Answer any 5 (five) questions from each section. Figures in the margin indicate full mark. Use separate answer script for each section.

Section-A

1. a) Define shellfish and shellfish biology. 2.0
b) How will you differentiate shellfish from finfish? 2.0
c) Write down the importance of studying shellfish biology in context of Bangladesh. 3.0
2. a) What do you know about habitat of a species? 2.0
b) Write the properties of some habitats which are important for sustaining shellfish growth and abundance. 5.0
3. a) What are the morphological and anatomical differences between *Loligo* and *Octopus*? 2.0
b) Describe the life cycle of *Loligo*. 5.0
4. Describe the reproduction and life cycle of *Penaeus monodon*. 7.0
5. a) Write the common name, scientific name and habitats of 5 commercially important crustaceans' species. 2.0
b) Describe the economic importance of molluscan and crustaceans Bangladesh context. 5.0
6. a) Write down the morphological features of oyster. 3.0
b) What do you know about the shell formation of oyster? 2.0
c) Enlist the commercially important oyster species found in Bangladesh. 2.0
7. a) What are the causes of loss of biodiversity and abundance of shellfish? 2.0
b) Describe how such loss can be mitigated? 5.0

Section-B

8. a) Define cephalopoda. 1.0
b) Draw a labeled diagram of *Octopus*. 2.0
c) Describe the reproduction procedure of *Octopus*. 4.0
9. a) Write down the morphological features of *Pila*. 3.0
b) Describe the female reproductive system of *Pila*. 4.0
10. a) Illustrate the mating procedure of shrimp. 3.0
b) Describe the life cycle of prawn (*Macrobrachium rosenbergii*). 4.0
11. a) Compare the differences between gastropods and bivalve. 2.0
b) Describe the reproduction and life history of green mussel. 5.0
12. a) Write down the taxonomic position of mud crab with it's common name. 2.0
b) Describe the larval development of mud crab (*Scylla serrata*). 5.0
13. a) Enlist the factors that affect the shellfish health. 2.0
b) Describe the environmental factors affects the abundance and biodiversity of shellfish. 5.0
14. Write short note 2 (*Any Two*) of the following: 3.5×2=7.0
 - a. Trochophore ,
 - b. Life cycle of crayfish,
 - c. Lobster, and
 - d. Brine shrimp

Chittagong Veterinary and Animal Sciences University, Chittagong

Faculty of Fisheries

Year -03, Semester-01, Final Examination' 2016

Course Code: FPI-301(T); Course Title: Fish Pathology and Immunology

Total Marks: 70, Time: 3 hours

Answer any 05 (five) questions from each section. The figures in the right margin indicate full marks. Use separate answer script for each section.

Section-A

1. a) What is infection? 2.0
b) Differentiate between infectious and non-infectious diseases. 2.0
c) Discuss the general signs of a diseased fish. 3.0
2. a) Define cyst, telangiectasis and inflammation. 3.0
b) Describe cellular development, distribution in growth and degeneration in fish. 4.0
3. a) What do you mean by septicemia? 2.0
b) Describe musculointegumental and respiratory pathology of a bony fish. 5.0
4. a) Write scientific name of three obligate pathogen of fish. 2.0
b) What are the characteristics of obligate pathogen? 1.0
c) Describe any two viral diseases with their causative agents, diagnosis and epizootiology. 4.0
5. a) Draw and label a typical bacterial cell. 2.0
b) Describe any two of the following diseases with their etiology, symptoms, pathology and control measures: 2.5x2.0=5.0
i) Edwardsiellosis; ii) Vibriosis; and iii) MAS
6. a) Define immune response. 2.0
b) What are the characteristics of non-specific immune response in fish? 2.0
c) Describe cellular factors of non-specific immunity. 3.0
7. Write short notes on any 02 (two) of the following: 3.5x2.0=7.0
a) Cell line,
b) EUS, and
c) Immunomodulator

Section-B

8. a) Distinguish between 'Prebiotic' and 'Probiotic'. 3.0
b) Write down the importance of probiotic usage in Aquaculture. 4.0
9. a) What do you know about 'Pharmacology'? 2.0
b) Give a description of basic principles of pharmacology. 3.0
c) Mention the main differences between pharmacokinetics and pharmacodynamics. 2.0
10. a) Give a list of 4(four) nutritional diseases with their signs and control measures. 5.0
b) Describe pantothenic acid deficiency in various fish species. 2.0
11. a) Define vaccine and vaccination. 2.0
b) What are the different types of fish vaccines? 2.0
c) Name the fish diseases with their pathogens against which commercial vaccines are available. 3.0
12. a) Define dose and dosage. 2.0
b) Briefly describe the drug selection criteria for fish disease treatment. 2.0
c) What do you mean by withdrawal period? Why is it important to follow withdrawal period after treatment? 3.0
13. a) Define antibody titre. 1.0
b) What are the advantages of monoclonal antibody over polyclonal one? 2.0
c) Briefly describe principles of four important immunodiagnostic techniques with their merits and demerits. 4.0
14. Write short notes on any 02 (two) of the following: 3.5x2.0=7.0
a) Immunoglobulin,
b) Serology, and
c) Immunostimulants.

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Faculty of Fisheries

Year -03, Semester-01, Final Examination' 2016

Course Code: IOA-301(T); Course Title: Integrated and Organic Aquafarming

Total Marks: 70, Time: 3 hours

Answer any 05 (five) questions from each section. The figures in the right margin indicate full marks. Use separate answer script for each section.

Section-A

1. a) Define integrated and organic aquafarming. 2.0
b) What are the main objectives of integrated aquaculture? 2.0
c) Describe the current status of integrated aquaculture in Bangladesh. 3.0
2. a) Write down the principle of aquaponics. 2.0
b) Briefly describe different types of aquaponic systems. 5.0
3. a) What are the merits and demerits of integrated farming? 2.0
b) Show the labeled diagram of an integrated aqua-farm. 2.0
c) Give an account of historical background of integrated aquaculture. 3.0
4. a) Describe different categories of integrated aquafarming. 4.0
b) What is the importance of fish culture in paddy field? 3.0
5. a) Write down the constraints and prospects of farming poultry in association with fish in lentic habitat. 2.0
b) Describe in details about the integrated framing of poultry and fish. 5.0
6. a) What is the significance of livestock farming integrated with fish culture? 2.0
b) Describe the culture technique of animal-animal-fish or plant-animal-fish integrated farming. 5.0
7. Write short notes on any 02 (two) of the following: 3.5x2.0=7.0
a) Energy budgeting,
b) Fish breeding and nursing in paddy field, and
c) Combined vs Rotational Culture

Section-B

8. a) What is the relation of organic aquaculture with environment? 2.0
b) What is organic shrimp? 2.0
c) "More than 90% organic shrimp contributed by developing countries"- justify. 3.0
9. a) What types of integrated aquaculture could be practiced in Bangladesh? 2.0
b) Describe different systems attributes of integrated aquaculture. 5.0
10. a) Define Environmental Impact Assessment (EIA). 2.0
b) Mention the factors need to be considered for rice fish culture. 5.0
11. a) What do you mean by organic certification? 2.0
b) Discuss the role of IFOAM group concerning organic aquaculture production. 5.0
12. a) How will you control the environmental degradation in integrated farming? 3.0
b) Calculate a cost-benefit analysis of an integrated farm. 4.0
13. a) Compare conventional and organic aquafarming. 2.0
b) Write down the advantages of fish-horticulture system. 5.0
14. Write short notes on any 02 (two) of the following: 3.5x2.0=7.0
a) Multi-components integrated system,
b) Certified organic fish feed, and
c) Risks and marketing of integrated farming

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Faculty of Fisheries

B.Sc. Fisheries (Hons.) Year-03 Semester 01, Final Examination' 2016

Course code: **IFM-301(T)**, Course Title: **Inland Fisheries Management (Theory)**

Total Marks: 70, Time: 3 hours

Answer any **05 (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 life history data? 1.0
b) Write down the importance of life history data for proper inland fisheries management. 2.0
c) Classify fish species based on different life history parameters. 4.0
2. a) Define fisheries regulation. 1.0
b) What are the importances of regulation in fisheries management? 2.0
c) Briefly discuss different types of fisheries regulations. 4.0
3. a) Define habitat restoration. 1.0
b) What are the basic requirements of a fish way? 2.0
c) How will you improve habitat of a river? 4.0
4. a) Write down the general principles of fisheries cooperative. 2.0
b) How does fisheries cooperative help in fisheries management? 3.0
c) Write down the major activities of fisheries cooperative. 2.0
5. a) What are the characteristics of Hilsa? 1.0
b) List down the Hilsa fish sanctuary areas in Bangladesh. 2.0
c) What are the challenges of managing Hilsa fisheries in Bangladesh? 4.0
6. a) Define recreational fisheries. 1.0
b) How recreational fisheries can be a successful tourism business? 2.0
c) Write down the potentialities of recreational fisheries in Bangladesh. 4.0
7. a) What do you mean by sustainability? 1.0
b) What are the principles of managing fisheries sustainably? 2.0
c) Briefly describe sustainable livelihood framework for managing fisheries in Bangladesh. 4.0

Section-B

8. a) What is fisheries management? 2.0
b) Write down the objectives of fisheries management. 2.0
c) Why is fisheries management so important? 3.0
9. a) List down any three laws and regulation related to fisheries in Bangladesh. 1.0
b) How do you enforce regulation for fisheries management? 2.0
c) What do you know about "National Fisheries Management Policy" in Bangladesh? 4.0
10. a) What is fish pass and fish screen? 2.0
b) What are the purposes of fish screen? 2.0
c) Write down the general types of fish ways. 3.0
11. a) What do you mean by CBFM? 1.0
b) Write down the role of different stakeholders to run a cooperative successfully. 3.0
c) What do you know about the Govt. policy for the management of *Khas* waterbodies in Bangladesh? 3.0
12. a) Why is Hilsa fisheries management important for Bangladesh? 2.0
b) Show the major spawning grounds of Hilsa in the map of Bangladesh. 2.0
c) Write down the government laws to improve Hilsa stock in Bangladesh. 3.0
13. a) List down different types of recreational fisheries activities. 1.0
b) Write down the important considerations to implement recreational fisheries management. 3.0
c) What are the different conservation issues, might facing during recreational fisheries? 3.0
14. a) What are the key indicators to assess the achievement of sustainable livelihoods? 2.0
b) What do you mean by ecosystem approach for fisheries management? 2.0
c) Write down the properties of sustainable fishery? 3.0

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B.Sc. Fisheries (Hons.) Year-03 Semester 01, Final Examination' 2016

Course code: CCF-301(T), Course Title: **Climate Change and Fisheries (Theory)**

Total Marks: 70, Time: 3 hours

Answer any **05 (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 climate change and climate variability? 2.0
b) Discuss the natural processes and anthropogenic activities affecting the earth's temperature and the resultant climate change. 5.0
2. a) What is adaptive response in climate science? 1.0
b) Why solar irradiance is not considered as a potential source of modern climate change on earth? 3.0
c) Predict future climate change on the globe. 3.0
3. a) Define Biodiversity. 2.0
b) "Climate factors play major role in the loss of biodiversity"- justify. 5.0
4. a) What are the influences of climate changes on sea surface temperature and sea level rise? 2.0
b) "Climate change could put additional stress on coastal ecosystem"- explain. 5.0
5. a) What are the expected changes in inland waters due to climate change? 2.0
b) Describe the impacts of temperature variation and rainfall on fish biology. 5.0
6. a) What does IPCC stands for? Mention its aims. 2.0
b) Estimate aquaculture's potential contribution to climate change. 5.0
7. a) Draw a "potential impact pathways" of climate change on capture fisheries. 4.0
b) Discuss the role of institution in undertaking adaptive responses of climate change. 3.0

Section-B

8. a) What are the components of climate? 2.0
b) Mention some evidences of modern climate change. 2.0
c) Write a note on green house gases along with their chemical structures. 3.0
9. a) What do you mean by community based adaptation? 2.0
b) Describe the limits of community based adaptation against sea level rise for the coastal belt of Bangladesh. 5.0
10. a) What do you know about "Kyoto Protocol Adaptation Fund"? 2.0
b) Describe the ongoing adaptive measures against climate change in the fisheries sector of Bangladesh. 5.0
11. a) "Ocean sustainability, density and stratification are highly interlinked" – justify. 3.0
b) How does mechanisms of upwelling affect by unusual climatic events? 4.0
12. a) What is artisanal fisheries? 1.0
b) Mention the positive potential impacts of climate change on capture fisheries. 3.0
c) What should be the adaptive measures in capture fisheries management? 3.0
13. a) What are the major climatic changes that would potentially impact on aquaculture? 4.0
b) Write down the potential direct impacts of climate change on aquaculture. 3.0
14. a) How do spawning and recruitment link with each other? 2.0
b) Describe the impacts of climate change on fish recruitment processes and growth. 5.0

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B. Sc. Fisheries (Hons.) Year-03 Semester 01, Final Examination' 2016
Course code: **APT-301(T)**, Course Title: **Aquatic Pollution and Toxicology (Theory)**

Total Marks: 70, Time: 3 hours

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

Section-A

1. a) What is ocean acidification? 1.0
b) Differentiate between pollutants and pollution. 2.0
c) "Karnafully river estuary gradually being highly polluted from various non-point source pollutants" – explain the statement. 4.0
2. a) What are the roles of atmospheric carbon in ocean pollution? 2.0
b) Why concentration of CO₂ is lower in ocean surface? 2.0
c) Illustrate the dissolution, circulation, transformation and removal of CO₂ in carbonate system in respect of aquatic pollution. 3.0
3. a) What are the bio-chemical characteristics of sewage pollution? 2.0
b) How industrial pollution hampers the natural breeding ground of fish? 1.0
c) Discuss the ecological and biological impact of industrial pollution. 4.0
4. a) What do you understand by oil spill in the ocean? 2.0
b) State the sources and toxicity of petroleum hydrocarbon. 2.0
c) Illustrate the biological, physical and chemical process of treatment to remove oil spill in ocean surface. 3.0
5. a) Define toxicity and toxicology. 3.0
b) Explain the mechanisms of bioaccumulation and biomagnifications of pollutants in food chain. 4.0
6. a) Define solid waste. 2.0
b) Explain the problems of solid waste and medical waste. 5.0
7. Write short note on **any 2 (two)** of the following: 3.5×2=7.0
a) Hydrothermal vents,
b) Eutrophication process,
c) Bilge and Ballast water, and
d) Pollutants.

Section-B

8. a) What do you mean by marine pollution? 1.0
b) Illustrate the human impacts to the hydrological cycle that create aquatic pollution. 3.0
c) "Change in pH and depleted DO enhance the deterioration process of aquatic environment" – explain the statement. 3.0
9. a) Narrate the major diseases caused by water pollutants and their pathway of pollution. 3.0
b) What are the best methods of pollution control in case of shipyard pollution? 2.0
c) Specify the effect of ship recycling activities on coastal waters. 2.0
10. a) What do you mean by organic pollution? 2.0
b) Explain the changes in the benthic community due to organic pollution. 5.0
11. a) What is sedimentation tank? 1.0
b) How waste water is cleaned and treated before returning to the natural waters? 3.0
c) Illustrate the effluent treatment process along with primary to tertiary level to control industrial pollution. 3.0
12. a) What do you mean by contamination? 1.0
b) Specify the sources and toxic effects of mercury in aquatic environment. 2.0
c) How does mercury (Hg) get into the fish tissues? Describe the mechanisms of biomagnifications of Hg. 4.0
13. a) What is pesticide? Differentiate between pesticide and herbicide. 3.0
b) How organochlorine pesticide effect on marine organisms? 4.0
14. Write short note on **any 2 (two)** of the following: 3.5×2=7.0
a) Environmental legislation for harmful chemicals,
b) Active sludge process,
c) Bioassay test, and
d) Heavy metal pollution.

Chittagong Veterinary and Animal Sciences University, Chittagong
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B. Sc. Fisheries (Hons.) Year – 03 Semester – 01, Final Examination 2016

Course No: 301 (T), Course Title: Fish Processing (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) State the modern approach to fish Processing. 2.0
b) Give a schematic diagram of *Tenualosa ilisha* marketing channel practices in Bangladesh. 3.0
c) Write down necessities of fish processing in Bangladesh. 2.0
2. a) Define rigor-mortis. Write down significance of rigor-mortis in fish processing. 2.0
b) How rigor-mortis affects frozen whole fish?. 5.0
3. a) List out different methods of fish chilling. Write down the changes occur in fish during chilling. 3.0
b) List down English name and scientific name of 5 (five) fin fishes commercially harvested from the Bay of Bengal. 2.0
c) Write down the principles of refrigeration. 2.0
4. a) What is cryogenic freezing? 2.0
b) Why water in fish is not frozen at 0°C? 2.0
c) Prepare a list of freezers used for fish freezing in different countries of the world. 3.0
5. a) Suppose you are given to process 1 ton of *Tenualosa ilisha* in an air-blast freezing plant. The ambient temperature of fish is 38°C and the processed fish (*Tenualosa ilisha*) temperature will be -40°C. Calculate the energy requires processing the supplied sample. 4.0
b) What is freezing time? Write down factors affecting freezing time of fish. 3.0
6. a) What is freezing curve? Draw schematic diagram of an ideal fish freezing curve. 3.0
b) Write down detail procedure of shrimp processing in a horizontal plate freezer. 4.0
7. Write short notes **any two** on the following: 3.5 x 2= 7.0
(a) Rancidity; (b) Quick freezing; (c) Thawing, and (d) Glazing

Section B

8. a) Differentiate between drying and dehydration. 2.0
b) What do you mean by maturation or ripening in salt processing of fatty fish? 1.0
c) How will you compare (merits and demerits) among different fish salting techniques? 4.0
9. a) Write down the source of smoke. 2.0
b) Classify smoked fish. Give a detail hot smoking processing techniques of fish. 5.0
10. a) What is fish canning? Write down advantages of canning over other methods of fish processing. 2.0
b) Describe various types of retorts use in heat processing of canned foods. 4.0
c) Define commercial sterility. 1.0
11. a) What do you mean by two-piece cans? Write down advantages of two-piece cans. 3.0
b) Write down spoilage occurs in canned fish. 3.0
c) List out common problems associated with canned fishery products. 1.0
12. a) How will you prepare mince-based fish products? Write down 5 (five) mince-based products. 2.0
b) Write down the composition and role of additives used in 'Surimi' preparation. 2.0
c) Classify fermented fishery products. Write down processing of 'sheedal sutki' from native 'Punti sp'. 3.0
13. a) Mention the advantages of Modified Atomsphere Packaging of fish and fish product. 1.0
b) Write down gas ratio for modified atomsphere packaging of the following: 3.0
(i) Lean fish, (ii) Shrimp, (iii) Fatty fish, and (iv) Smoked fish.
c) Give a brief account on application of irradiation in fish and fishery products preseravtion. 2.0
d) What is freeze drying? 1.0
14. Write short notes **any two** on the following: 3.5 x 2= 7.0
a) Pickle curing, (b) Lacquering of can, (c) 12 D concept, and (d) Design of a cold storage

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B. Sc. Fisheries (Hons.) Year-03 Semester 01, Final Examination' 2016

Course code: **RSO-301(T)**, Course Title: **Rural Sociology (Theory)**

Total Marks: 70, Time: 3 hours

*Answer any **4 (four)** questions from each section where question **1(one) & 6 (six)** are compulsory. Figures in the right margin indicate full mark. Use separate answer script for each section.*

Section-A

1. a) Define rural sociology. 2.0
b) Write down the advantages of sociology. 3.0
c) Discuss the role of rural sociologist to fishermen community development. 3.0
2. a) What is rural and urban society? 4.0
b) Discuss the social and economic differences between rural and urban societies. 5.0
3. a) What is poverty? 2.0
b) What is urbanization? 3.0
c) Narrate the factors of human development. 4.0
4. a) Write the difference between livelihood and sustainable livelihood. 3.0
b) What are the objectives of sustainable livelihood? 2.0
c) Explain the core principle of livelihood. 4.0
5. Write the history of fisheries development of Bangladesh. 9.0

Section-B

6. a) What is meant by social survey? 2.0
b) Name the different types of questionnaire. What are the objectives of social survey? 3.0
c) What are the various types of survey? 3.0
7. a) What is aquatic environment? 3.0
b) Discuss the causes of degradation fisheries habitat and aquatic environment. 6.0
8. a) Define migration. What are the categories of migration? 4.0
b) Explain the causes and effects of migration. 5.0
9. a) What is ecology? 3.0
b) What is fish diversity index? 3.0
c) What kind of crop produced in high diversity index area? 3.0
10. a) What do you understand the inter-relationship among poverty, fisheries and food security? 4.0
b) Briefly discuss the role and contribution of GO, NGO and private sector towards agro-fishery development in Bangladesh. 5.0

Chittagong Veterinary and Animal Sciences University, Chittagong
Faculty of Fisheries

B. Sc. Fisheries (Hons.) Year -02 Semester-01, Final Examination' 2018

Course No: MBI-201 (T), Course Title: **Marine Biology (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 Marine Biology? How will you apply your knowledge of Marine Biology in the field of marine sector in Bangladesh? 4.0
b) How marine archaea differ from bacteria? Write down the general characteristics of marine virus with their ecological roles. 3.0
2. a) Why is virus called both living and non-living organism? How marine bacteria contribute in nitrogen fixation and nitrification in marine environment? 3.0
b) Are marine protozoans autotrophic or heterotrophic? 1.0
c) Discuss the role of foraminifera in marine aquatic environment. 3.0
3. a) "Phytoplankton is the base of food chain"- explain the statement. 2.0
b) Differentiate between Calcareous and Siliceous phytoplankton 2.0
c) Briefly discuss the major factors affecting growth and distribution of phytoplankton in Oceans. 3.0
4. a) What is benthic community? Classify marine benthos with their role in EPS formation. 3.0
b) "Benthic organisms are important bio-indicator of estuarine system"-Explain the statement. 2.0
c) "Neritic zone is the productive oceanic zone"- briefly explain. 2.0
5. a) Define Seaweed and Sea grass. What are the potential seaweeds available in Bangladesh coast for commercial culture? 3.0
b) What is coral and coral reef? What are the probable causes of coral bleaching? 2.0
c) What are the ecological roles of algae in marine environment? 2.0
6. a) Describe the life cycle of Aurelia. 4.0
b) What is algal Bloom? Give a brief account of its impact on marine environment. 3.0
7. a) Why hagfishes are called slime eel? 2.0
b) What do you know about Ichthyoplankton? 1.0
c) Discuss the physiological mechanism of marine fishes for living in high saline water. 4.0

Section-B

8. a) What do you mean by the term "Purging"? 1.0
b) What are the different types of cephalopods found in ocean environment? 2.0
c) Describe the life cycle of oyster. 4.0
9. a) What is "Gemmules" and "Smoking" of sponge? 2.0
b) Why scyphozoans are called true jellyfish? 2.0
c) Illustrate the life cycle of marine protozoans. 3.0
10. a) Why plankton concentration is high in higher latitude and spring season in marine environment? 2.0
b) Briefly describe the theories to explain the apparent mutual explosion of the phytoplankton and the zooplankton. 5.0
11. a) What are the ecological roles of marine Arthropods? 2.0
b) How will you identify a healthy adult *Penaeus monodon*? 2.0
c) Illustrate the life cycle of shrimp. 3.0
12. a) How does seagrass reproduce? Briefly describe the structure of seagrass. 4.0
b) Describe the life cycle of seaweed which show alternation of generation. 3.0
13. a) List down ten scientific names and common names of commercially important marine fishes of Bangladesh. 3.0
b) Describe the life cycle of Hilsha fish in Bangladesh. 4.0
14. Write short notes on **any two** of the followings: 3.5×2
a) Marine reptiles and birds b) HNLC c) Redtide d) Marine mammals