*Answer any **4 (four)** questions. Figures in the right margin indicate full mark.*

1 a) Analyze the formation of the ocean relief features with their appropriate illustration.　4.0

   b) Assess how thermohaline circulation is conveyed and regulated around the world.　4.0

   c) Describe the chronology for the development of oceanographic study.　2.0

2 a) Compare and contrast in between the submarine features of Indian Ocean and Bay of Bengal.　6.0

   b) "Sediments are characterized by their bedding patterns"- explain with appropriate examples.　4.0

3 a) Compose a scenario where all the gyres help regulate the global climatic condition.　4.0

   b) Explain how El Niño and La Niña take place. Denote their substantial aftermaths.　4.0

   c) Outline the origins of sediments with their special features.　2.0

4 a) Rough a draft on the consequences of mid oceanic ridge in the movement of plate tectonics. Indicate how this process impacts on continental drift.　5.0

   b) Appraise the principles and mechanisms of the survey methods used in hydrography and bathymetry.　5.0

5 a) Discuss the formation of marine snow and ooze in ocean. Are these the same thing? How can they facilitate the ecosystem of the ocean.　4.0

   b) Summarize how the major nutrient cycling processes regulate the oceanic system.　6.0

Department of Marine Bioresource Science
Chattogram Veterinary and Animal Sciences University
MS in Marine Bioresource Science Final Examination Jan-June' 2023
Course No: RMF-501 (T), Course Title: Remote Sensing in Marine Fisheries (Theory)
Total Marks: 40, Time: 2 hours

*Answer any **4 (four)** questions. Figures in the right margin indicate full mark.*

1. a) What are the characteristics of spatial data? 3.0
   b) GIS is routinely used in applications such as habitat mapping. What are the advantages of using GIS in this context? 7.0

2. a) What is image enhancement and image filtering? 3.0
   b) Describe the pre-processing methods of digital image processing 7.0

3. a) Explain the classification of photogrammetry. 5.0
   b) Explain the importance of map projections for the users of GIS. 5.0

4. a) How many data structures can be used in GIS mapping and scales? 5.0
   b) What are the potential and existing uses of RS modeling in the field of marine fisheries management? 5.0

5. a) What do you mean by image classification? What are the major steps in satellite image classification? 5.0
   b) Explain the advantages and disadvantages of supervised and unsupervised classification. 5.0

6. a) Differentiate between Raster data and Vector data. 4.0
   b) What are the possible uses of photogrammetry in the sector of marine fisheries? 6.0

Chattogram Veterinary and Animal Sciences University, Chattogram
Department of Marine Bioresource Science
Master of Science in Marine Bioresource Science, January-June Semester Final Examination' 2023
Course No: **MRF-501 (Elective)**, Course Title: Mangrove and Reef Fisheries
Total Marks: 40, Time: 2 hours

<u>Answer any **FOUR** questions. Illustrate your answer wherever necessary.</u>

1. a) Discuss about the red mangrove, white mangrove, black mangrove, and buttonwood mangrove. — 4
   b) Mangroves function as the natural habitat for endangered species—Explain the statement. — 3
   c) Discuss in brief about the role of mangrove forest as nursery ground for coastal and marine fishes. — 3

2. a) Indiscriminate expansion of shrimp farming is the major cause of Chakaria Sundarban destruction of Bangladesh –Justify the statement. — 3
   b) Why Chakaria Sundarban mangrove restoration and regeneration is important for Bangladesh? — 3
   c) Formulate your own plan and recommendation for the restoration and regeneration of the Chakaria Sundarban mangrove forest of Bangladesh. — 4

3. a) Sundarbans mangrove forest is a unique ecosystem for fisheries resources of Bangladesh- Justify the statement — 3
   b) What are the major issues of the Sundarban mangrove-based fisheries of Bangladesh? Formulate your suggestions and recommendations to improve present scenario of Sundarban mangrove-based fisheries of Bangladesh. — 3+4

4. a) What do you mean by coral bleaching? Why coral bleaching is increasing day by day? — 3
   b) Why are coral reefs important in marine ecology? — 2
   c) Discuss how climate change affects the coral reef ecosystem? — 5

5. a) Coral reef fisheries are of great importance both economically and for food security-Justify the statement. — 3
   b) What do you mean by ecosystem-based coral reef fisheries management? — 2
   c) Discuss the major challenges of managing the reef fisheries. — 5

6. a) What do you know about Coral Reef Resilience? — 2
   b) MPAs promote responsible fishery management and habitat protection in the coral reef ecosystem----Justify the statement? — 4
   c) Explain about the MPA declaration of Saint Martin Island of Bangladesh. — 4

*Answer any **4 (four)** questions including **3 & 5**. Figures in the right margin indicate full mark.*
Download EXCEL using the link https://classroom.google.com/c/MjQ4ODQ1OTgwOTM2?cjc=zkpms6o

1.	a)	What are the main characteristics of a scientific research?	3
	b)	Enlist commonly used methods/tools used for qualitative research?	3
	c)	Differentiate between qualitative and quantitative research	4
2.	a)	What do you know about parametric and nonparametric assumption?	3
	b)	What do you know about seminar, conference, and workshop?	3
	c)	Write down the general guidelines for authors seen in a journal for article publications.	3
3.	a)	What is the use of SONAR in marine research?	2
	b)	How and what common statistical test are selected for biological data analysis?	4
	c)	Fish length (cm) and weight (gm) of *Tenualosa toli* from Bay of Bengal are given in **attached excel- Sheet3 from google classroom.** Now analyze the length-weight relationship and report the result accordingly.	4
4.	a)	Write down the assumptions of linear regression, t-test and ANOVA used in statistical test?	3
	b)	What is the use of p value in statistical analysis?	3
	c)	Parent size (µm) and offspring size (µm) of two sea star species is given in **attached excell-Sheet5.** How offspring size vary between these species?	4
5.	a)	How ichthyoplankton can be sampled from marine environment?	4
	b)	Fish length (cm) and egg diameter (µm) for three populations (1, 2, 3) of a fish species collected from Bay of Bengal **(data is in attached excell- Sheet1).** Now write hypothesis, statistical method, analyse data and report your findings based on given data.	6
6.	a)	What should be emphasized in abstract, introduction and result sections of a thesis?	6
	b)	In a feeding trial, 10 fishes were supplemented with vitamins. The length (cm) of fish before and after vitamin supplement is given below. What is the effect of vitamin supplement?	4

Fish no.	1	2	3	4	5	6	7	8	9	10
Before	54	62	58	70	73	80	72	60	68	67
After	68	80	76	85	85	90	80	78	78	70

*Answer any **4 (four)** of the following questions.*

1. a) What is the scope of Marine Biology in Fisheries Sector? — 2
   b) Describe the major groups of marine fishes. — 3
   c) How diverse the reproductive strategies in marine fishes are? — 5

2. a) Write down the major groups of echinoderm with their characteristics. — 5
   b) Describe the evolution of echinoderm larvae as a model for morphological diversity. — 5

3. a) How do sharks respire? — 4
   b) How diverse is larval nutrition in sharks? — 4
   c) How sharks are different from other fishes? — 2

4. a) Differentiate among seaweed, seagrass and saltmarsh. — 3
   b) Sketch the morphology of a typical seaweed. — 3
   c) Explain alteration of generations in seaweed reproduction. — 4

5. a) What are stenohaline and euryhaliane organisms? — 2
   b) Describe marine fish migration patterns with examples. — 5
   c) Enlist the marine mammals and their conservation status in the maritime boundary of Bangladesh. — 3

6. a) What is osmoregulation in fish? — 2
   b) How marine bony and cartilaginous fishes osmoregulate? — 5
   c) Write down the life cycle of any one of clam or mussel. — 4

Department of Marine Bioresource Science
Chattogram Veterinary and Animal Sciences University
MS in Marine Bioresource Science Final Examination Jul-Dec' 2022
Course No: MED-502 (T), Course Title: Marine Ecological Dynamics (Theory)
Total Marks: 40, Time: 2 hours

*Answer any **4 (four)** questions. Figures in the right margin indicate full mark.*

1. a) Briefly describe the marine faunal communities according to habitats and depth 3.0
    b) Discuss the ecological interactions between and among marine communities. 7.0

2. a) Explain the Large Marine Ecosystem (LME) and BOBLME 3.0
    b) Briefly describe the major features and zones of BOBLME 7.0

3. a) Illustrate the ocean food chain by including its major biotic and abiotic components 5.0
    b) Discuss the ecological pyramids of marine ecosystems. 5.0

4. a) Briefly describe the energetics of the marine ecosystem. 5.0
    b) Discuss the primary productivity and factors affecting the primary productivity of marine ecosystems. 5.0

5. a) "The coral reef is a unique marine ecosystem supporting one of the world's richest faunal biodiversity"- explains the statement. 5.0
    b) Briefly describe the major components of the coral reef ecosystem and present challenges of the coral reef ecosystem management. 5.0

6. a) Explain the ecosystem approach with its importance in marine fisheries management. 4.0
    b) Write short notes on any two (02): 6.0
        i. Deep ocean ecology;   ii. Coral food web;   iii. Marine microbial food web;