R0601	Sub. Code
	548501

M.Sc. DEGREE EXAMINATION, NOVEMBER – 2023

Fifth Semester

Integrated Marine Biology

BIOCHEMISTRY

(CBCS – 2019 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

All questions carry equal marks.

1. Define pH and add a note on acid and base.
2. Explain co–valent bond with example.
3. Note on chemical characters of carbohydrates.
4. What is stereoisomerism?
5. Note on aromatic aminoacids.
6. Explain conjugated protein.
7. Define micelles.
8. Write about good and bad cholesterol.
9. HMP pathway.
10. Define deamination and transamination.

Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Write an account on bio–macromolecules and their significance.

Or

(b) Explain various thermodynamics laws and their biological importance.

12. (a) Write an account on the structural configuration of disaccharides with suitable example.

Or

(b) Define polysaccharide and add a note on its importance.

13. (a) Give a short account on denaturation and iso–electric point of proteins.

Or

(b) Describe the properties of aminoacids.

14. (a) Explain the chemical composition and biological properties of fats.

Or

(b) Comment on LDL and HDL and their significance.

15. (a) Briefly discuss tricarboxylic acid cycle.

Or

(b) Explain the role of ribonucleotide reductase in nucleic acid metabolism.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Give a detailed account on acid–base maintenance and its significance.

17. Write an essay on classification, structure, properties and functions of carbohydrates.

18. Classify aminoacids and explain the reactions of aminoacids due to amino and carboxyl groups.

19. Write an essay on types, structure, properties and functions of lipids.

20. Discuss in detail about urea cycle and its importance.

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R0602	Sub. Code
	548502

M.Sc. DEGREE EXAMINATION, NOVEMBER – 2023

Fifth Semester

Integrated Marine Biology

COASTAL AND BRACKISH WATER AQUACULTURE

(CBCS – 2019 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

All question carry equal marks.

1. Natural stock
2. Aquaculture
3. Drainage canal
4. Pen culture
5. Seaweed
6. Parasites
7. Spat
8. Brood stock
9. CAA
10. RGCA

Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Write about the socio economic problems in aquaculture.

Or

(b) Why overfishing must be banned?

12. (a) Describe briefly on the various dykes shrimp ponds.

Or

(b) Write about the Cage culture.

13. (a) Briefly explain the economic importance of seaweeds.

Or

(b) Write down the measures for controlling the pests and predators in aquaculture pond.

14. (a) Write about the present status of molluscan culture in India.

Or

(b) Write notes on various filters used in shrimp hatchery.

15. (a) Briefly write about the role of BFDA in aquaculture extension programs.

Or

(b) Write notes on the roles of NGO in fisheries development.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Write an essay on the criteria for selecting a suitable site for aquaculture.

17. Why coastal aquaculture is proposed in India?

18. Describe in detail the present status of Vannamei farming in India.

19. Write an essay on hatchery seed production of *P. monodon*.

20. Describe in detail the roles of various government agencies involved in coastal aquaculture development.

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R0603	Sub. Code
	548E01

M.Sc. DEGREE EXAMINATION, NOVEMBER – 2023

Fifth Semester

Integrated Marine Biology

Elective – MARINE BIODIVERSITY AND CONSERVATION

(CBCS – 2019 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

All questions carries equal marks.

1. Define Ecological diversity.
2. Note on Shannon's index.
3. Define deme.
4. What is endemism?
5. What is a marine protected area?
6. Explain the objectives of restoration.
7. Note on threats to marine biodiversity.
8. Define biocultural diversity.
9. Explain the purpose of Biodiversity Act.
10. Write an ocean acidification.

Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Write an account on the importance of species diversity in the marine ecosystem.

Or

(b) Explain the concept of species evenness and richness.

12. (a) Explain the concept of small population.

Or

(b) Illustrate the various provisions for protection of marine species.

13. (a) List out the various marine protected areas in India and their significance.

Or

(b) Write an account on management of marine protected areas.

14. (a) Discuss in detail about the major impediments to marine biodiversity conservation.

Or

(b) Write an essay on fragmented decision making.

15. (a) Discuss the Laws and Acts which govern the conservation of marine diversity.

Or

(b) Give a detailed account on role of National Biodiversity Authority of India.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Write a detailed account on extinction of marine bio-resources.

17. Explain the various strategies of conservation of small population.

18. Give a detailed account on restoration and management of marine protected areas.

19. Write an essay on jurisdictional gaps and overlaps of biodiversity conservation.

20. Discuss in detailed about the National and International approaches for conservation and sustainable development of biodiversity.

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R0604	Sub. Code
	548E02

M.Sc. DEGREE EXAMINATION, NOVEMBER – 2023

Fifth Semester

Integrated Marine Biology

Elective : COASTAL ZONE MANAGEMENT

(CBCS – 2019 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Define "Coastal Zone".
2. Write four points on IMO responsibility.
3. Differentiate marine biosphere reserves and marine park.
4. Name four "Coastal Ecosystem".
5. Give example for mitigation measures in India about Coastal ecosystem protection.
6. Write short notes on global warming.
7. How can you protect coast?
8. What do you mean by Beach nourishment?
9. Name four international agencies for Ocean management.
10. Role of UNEP for Ocean protection.

Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Write about Mangroves and their importance.

Or

(b) Explain law of the sea.

12. (a) How can you make Coastal resources conservation and what are the issues you are facing?

Or

(b) Short notes on protected Area management.

13. (a) Name any four natural hazards and give short notes on any one of them.

Or

(b) Write about global warming and their impact on ocean.

14. (a) Differentiate sea wall and groine with neat diagram.

Or

(b) Write short notes on Bioshields and their impact on coasts.

15. (a) Role of UNESCO – Explain.

Or

(b) Role of MPEDA – Explain.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Explain about Coastal wetlands.

17. Differentiate endanger and extinct species and write short notes on resources conservation and what are the conservation site in India.

18. Write about mitigation measures on Marine pollution in India.

19. Explain about Coastal protection structures.

20. What are the research activities carrying NIOT and NIO.

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R0605	Sub. Code
	548701

M.Sc. DEGREE EXAMINATION, NOVEMBER – 2023

Seventh Semester

Integrated Marine Biology

IMMUNOLOGY

(CBCS – 2019 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Innate Immunity
2. Bone Marrow
3. Acquired Immunity
4. Immunoglobulin
5. Three way Antibody work
6. Antigen made up of?
7. Tonsil
8. Thymus
9. Spleen
10. Lymphocyte

Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) How active Immunity different from Passive Immunity?

Or

(b) Describe the Primary and Secondary lymphoid organs.

12. (a) What is Immune Diseases and how it works?

Or

(b) Explain the function of Immunoglobulin.

13. (a) Describe Hypersensitivity and its type.

Or

(b) Explain the Antigen and Antibody interaction and types of Antigen – Antibody Reaction.

14. (a) What is the nature of Lymphocytes and its characteristics?

Or

(b) Give a brief description about T lymphocytes.

15. (a) What is Primary and Secondary response?

Or

(b) Discuss in brief about Humoral immune response.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Discuss in detail about the Immunity and its types.

17. Give a detailed description on the structure and biological properties of Immunoglobulin.

18. Write an essay on the Tumor Immunology and its working principle.

19. Describe the definition and function of Lymphocyte and how it worked as an Immune response.

20. Write an essay on the Stem cells.

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R0606	Sub. Code
	548702

M.Sc. DEGREE EXAMINATION, NOVEMBER – 2023

Seventh Semester

Integrated Marine Biology

GENETICS

(CBCS – 2019 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Define Mendel's law of dominance.
2. Note on Punnett's checker board.
3. What is epistatic and hypostatic gene.
4. Define atavism.
5. Define allele with example.
6. Write the possible genotype for long wings in Drosophila.
7. What is bleeder's disease?
8. Define holandric gene.
9. Define non-disjunction.
10. Note on heterosis.

Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Explain the Mendel's law of segregation with suitable example.

Or

(b) Write an account on simple Mendelian traits in man.

12. (a) Give a note on duplicate recessive genes with example.

Or

(b) What is polygenic inheritance? Explain with example.

13. (a) List out the characters of multiple alleles.

Or

(b) Write an account on linkage and crossing over in Drosophila.

14. (a) A woman who is not herself a haemophilic, marries a normal man but whose father was haemophilic. What is the chance of haemophilia in their children?

Or

(b) Write an account on Cynandromorph.

15. (a) Discuss the chances of Turner's syndrome and add a note on its clinical features.

Or

(b) Explain the role of genetic counselling.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Discuss in detail about Mendel's law of independent assortment and its mechanism.

17. Write an essay on interaction of genes.

18. Give an elaborate account on genetics of human blood groups and their inheritance.

19. Describe the chromosome maps of sex chromosomes of man and add a note on the sex-linked genes and their inheritance.

20. Write an essay on different types of inborn errors of metabolism.

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R0607	Sub. Code
	548703

M.Sc. DEGREE EXAMINATION, NOVEMBER – 2023

Seventh Semester

Integrated Marine Biology

APPLICATION OF REMOTE SENSING AND GIS

(CBCS – 2019 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Sensor
2. Aerial camera
3. Microwave sensing
4. NRSA
5. NOAA
6. GIS
7. QuikBird
8. EMR
9. EOS
10. Lansatseries

Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Describe the characteristics of Electro Magnetic Spectrum.

Or

(b) Comment on Electro Magnetic energy interaction in the Earth surface.

12. (a) Explain the application of Photogrammetry.

Or

(b) Write an account on Multi spectral scanner.

13. (a) Briefly describe the working principles of Landform identification.

Or

(b) Write notes on the application of GIS in Wetland Mapping.

14. (a) Describe briefly on the Seasat.

Or

(b) Write brief account on Earth observing system.

15. (a) Write notes on the components of Raster and Vector data.

Or

(b) What do you mean by Digital Elevation Model?

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Write an essay on the working principles of Remote sensing.

17. Describe in detail various sensor and platforms

18. Write an essay on the visual image interpretation and its applications in various fields

19. Describe in detail GIS and its limitation in usage

20. Write an essay on the various software used in Remote sensing.

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R0805	Sub. Code 548E04

M.Sc. DEGREE EXAMINATION, NOVEMBER – 2023.

Seventh Semester

Integrated Marine Biology

Elective : MARINE POLLUTION

(CBCS – 2019 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** the questions.

1. Name main sources of marine pollution.

2. What are the factors influencing toxicity?

3. How agricultural waste affect the marine environment?

4. Define marine litters.

5. Why pesticides are concern?

6. How offend marine mammals getting affected due to marine pollution?

7. Relate oil pollution with water quality impacts.

8. What is bio invasion?

9. Differentiate bio accumulation and bio magnification.

10. AAS define.

Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Name major pollutant and explain their impacts.

Or

(b) How can marine organism affect by pollution describe?

12. (a) Write notes on sewage entry in to marine environment and changes in physico-chemical water quality parameters.

Or

(b) Summarize the eutrophication impact in marine environment.

13. (a) Write detailed note on heavy metal pollution.

Or

(b) Take apart of the ecological impacts due to marine pollution.

14. (a) Compare thermal pollution and oil pollution and their impacts.

Or

(b) Name any four radioactive elements to affect the marine environment and explain.

15. (a) Illustrate some environmental monitoring methods and explain any one of them.

Or

(b) How can you make water quality assessment discuss?

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Write an essay on marine pollution.

17. Discuss the different treatment methods of marine pollution.

18. Describe different sources of marine pollution and explain any one of the sources in detail.

19. Make a note on thermal pollution is elated to many marine activities arid climate change role in marine pollution as per your perception.

20. Write a detailed note different analytical instrument.

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R0608	Sub. Code
	548901

M.Sc. DEGREE EXAMINATION, NOVEMBER – 2023

Ninth Semester

Integrated Marine Biology

MARINE MICROBIOLOGY

(CBCS – 2019 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Note on bar-built estuary.
2. Write about Thermus aquaticus.
3. Types of water sampling.
4. How are plankton nets are classified?
5. Write the composition of PDA culture media.
6. Define disinfectants.
7. Why biogeochemical cycles are called Nutrient cycle?
8. What is the role of nitrobacter?
9. What is fermentation?
10. Mention the advantages of biofuels.

Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Explain the scope of marine microbiology.

Or

(b) Write an account on extremophiles.

12. (a) Describe the structure, technique and application of Hydro–Bios sampler.

Or

(b) Comment on Plankton nets.

13. (a) Describe the types, chemical composition and preparation of culture media for actinomycetes.

Or

(b) How to identify microbes? Explain.

14. (a) Describe the carbon cycle.

Or

(b) Explain the phosphorous cycle.

15. (a) Give a detailed account on mushroom production.

Or

(b) Write an account on probiotics and exo–polysaccharides.

Part C (3 × 10 = 30)

Answer any **three** questions.

16. Write a detailed account on marine microbial diversity.

17. Write an essay on ecology of coastal micro organisms.

18. Discuss the role of fatty acids and 16S rRNA gene sequence in the identification of microbes.

19. Give a detailed account on Nitrogen cycle.

20. Write an account on fermentation process and its industrial application.

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R0609	Sub. Code 548902

M.Sc. DEGREE EXAMINATION, NOVEMBER – 2023

Ninth Semester

Integrated Marine Biology

ENVIRONMENT IMPACT ASSESSMENT

(CBCS – 2019 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Comprehensive EIA.
2. CRZ.
3. Faecal coliform.
4. TOC.
5. Concept of Biotic community.
6. Spatial replication.
7. Taxonomic sufficiency.
8. BENTIX.
9. Shannon-Weiner index.
10. Bray-Curtis.

Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Write notes on the soil texture analysis.

Or

(b) Briefly describe the procedures involved in environmental clearance.

12. (a) Describe briefly on the rationale in selection of sampling points.

Or

(b) Comment on the Air pollution.

13. (a) Describe methodologies to be adopted for studying nutrient characteristics.

Or

(b) Compare and contrast primary and secondary data.

14. (a) Write brief notes on the univariate methods in diversity assessment.

Or

(b) How does the ecological quality index works for water management?

15. (a) Briefly describe the working principles of ABC curves with a suitable example.

Or

(b) Describe briefly on the bathymetry component in EIA.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Write an essay on the various components in EIA study

17. Discuss in detail design and methods of data collection.

18. Write an essay on the various essential water and sediment parameters.

19. Discuss in detail about the risk assessment and environmental management.

20. Write an essay on the utility of biotic indices in environment health management.

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R0610	Sub. Code
	548903

M.Sc. DEGREE EXAMINATION, NOVEMBER – 2023

Ninth Semester

Integrated Marine Biology

RESEARCH METHODS IN MARINE BIOLOGY

(CBCS – 2019 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. e-journals.
2. Histogram.
3. SDS PAGE.
4. Spectroflurometer.
5. pH meters.
6. Median.
7. Correlation.
8. HPLC.
9. Hybridization.
10. Kurtosis.

Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Write notes on the importance of Google in research.

Or

(b) Discuss in brief about the computer aided techniques for data analysis.

12. (a) Briefly describe the principles of microtechniques.

Or

(b) Writes notes on the procedures involved in proximate composition.

13. (a) Briefly describe the chromatographic technique in biological research.

Or

(b) Write notes on the working principle of flame photometer.

14. (a) Briefly describe the principle of the UV—visible spectroscopy.

Or

(b) How does PCR helps in DNA fingerprinting?

15. (a) Comment on the following:

(i) Mean

(ii) Median and

(iii) Standard deviation

Or

(b) Write notes on the chi-square test and its applications in research.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Write an essay on the recent advancement in literature search in biological research.

17. Give a detailed account on principle and practice of Histo-chemistry in research.

18. Describe the various steps involved in collection and analysis of biological data.

19. Discuss in details about the principle and application of Electrophoresis techniques.

20. Write an essay on the application in bio informatics in biological research.

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R0611	Sub. Code
	548E08

M.Sc. DEGREE EXAMINATION, NOVEMBER – 2023

Ninth Semester

Integrated Marine Biology

Elective : MARICULTURE

(CBCS – 2019 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Why we need Aquaculture?

2. How to improve economy by aquacultural production.

3. Differentiate cages and pen culture.

4. What are the types of aquaculture ponds.

5. How to maintain brood stock.

6. Name any four water quality parameter to maintain in aquacultural pond.

7. Name any four commercial fishes for aquaculture.

8. Define Mussel culture.

9. What are the problems faced during open sea cage.

10. Write about seaweed culture.

Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) How aquaculture help in Indian economy explain.

Or

(b) Summarize history of aquaculture.

12. (a) What are the criteria need for aquaculture site selection explain.

Or

(b) Describe design and construction of open sea forming.

13. (a) Explain Hatchery production process and brood stock maintenance.

Or

(b) Discuss about disease management during aquaculture production.

14. (a) Why specific species selection for mariculture give explaination.

Or

(b) Shell fishes mariculture explain with examples.

15. (a) Role play of Indian companies and institutes involved in construction of open sea cages.

Or

(b) Write about economic benefits of seaweeds.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. How can you explain over fishing deplete natural living resources.

17. Describe site selection Technical consideration and their structural parameters.

18. Differentiate fin fish and molluscs culture and write the importance of both culture.

19. Write notes on cultural practices of chanos chanos.

20. Explain about open sea forming.
