

DEPT. OF MARINE LIVING RESOURCES, ANDHRA UNIVERSITY
MODEL QUESTION PAPERS WITH EFFECT FROM 2022-2023

M.SC. DEGREE EXAMINATION
Marine Biology and Fisheries
First Semester
Physical and Chemical Oceanography
(Effective from the admitted batch 2022-2023)

Answer all questions.
All questions carry equal marks.

Time: 3hours

Max. Marks: 70

Unit – 1

1. Give an account of the physical properties of sea water.
or
2. a. The sea is a suitable chemical environment. Explain.
b. Gulf stream

Unit – II

3. Define salinity. Draw the relationship between salinity and chlorinity.
or
4. a. Describe the conservative behavior of major elements,
b. Describe the factors affecting the distribution of gases in the sea water.

Unit – III

5. Describe the distribution of dissolved oxygen in the sea water column and factors affecting the distribution.

Or

6. a. Describe the buffer action of the sea water.
b. Give an account of the biological significance of the calcium carbonate precipitation in the marine environment.

Unit – IV

7. write an essay on the sea surface micro layer.
or
8. a. Describe the nitrogen cycle in the marine environment.
b. Regeneration of nutrient elements.

Unit – V

9. Name any two National Institutes of marine research and their contribution to the development of marine biology and fisheries in India.

Or

10. a. Scripp's institute of oceanography
b. INCOIS

M.SC. DEGREE EXAMINATION
Marine Biology and Fisheries
First Semester
Biological Oceanography
(Effective from the admitted batch 2022-2023)

Time: 3 hrs

Max. Marks: 70

Answer all the questions.
All questions carry equal marks

Unit I

1. Give an account on general classification and composition of plankton.
(Or)
2. a) Plankton net
b) Floating mechanisms

Unit II

3. Explain in detail about fixation and preservation of plankton.
(Or)
4. a) Standing crop
b) Bongo Net

Unit III

5. Write about the phytoplankton and Zooplankton relationship.
(Or)
6. a) Vertical migration
b) Oceanic plankton

Unit IV

7. Give a detail account of primary production of oceans.
(Or)
8. a) Particulate organic matter,
b) Factors affecting secondary production

Unit V

9. Give an account of Red tide phenomena in oceans.
(Or)
10. a) Pelagic food chain
b) Food pyramids in oceans

M.SC. DEGREE EXAMINATION
Marine Biology and Fisheries
First Semester
Marine Ecology
(Effective from the admitted batch 2022-2023)

Time: 3 hrs

Max. Marks: 70

Answer all the questions.
All questions carry equal marks

Unit – 1

1. Classify the marine environment, explaining the general characteristic features of each zone.

or

2. a. Describe the features and organisms that represent the shallow water benthic region.
b. Give an account of adaptations of deep sea organisms

Unit – II

3. Describe the effect of temperature, insolation and desiccation in the intertidal region.

or

4. a. Describe the distribution of life on rocky shore in relation to tides.
b. Give an account of adaptations of muddy shore organisms.

Unit – III

5. Discuss the role of environmental parameters in supporting the rich and specific biodiversity of Indo-west Pacific region.

Or

6. a. Illustrate and explain the special features of food web of mangrove ecosystem .
b. Describe zonation in coral reefs.

Unit – IV

7. Define ecological modelling. Give an account of the different components for constructing an ecological model.

or

8. a. Draw neat labelled diagrams of all invertebrate larval forms.
b. Describe the ecological importance of marine thalloid algae.

Unit – V

9. What is meiobenthos. Write the methods adopted for collection and enumeration of meiobenthic organisms

Or

10. a. Give an account of chemical composition of marine sediments.
b. Explain the animal- sediment relations

M.SC. DEGREE EXAMINATION
Marine Biology and Fisheries
First Semester
Biostatistics
(Effective from the admitted batch 2022-2023)

Time: 3 hrs

Max. Marks: 70

Answer all the questions.
All questions carry equal marks.

Unit I

1. Give an account on classification of data.
(Or)
2. a) Tabulation of data
b) Secondary data

Unit II

3. Explain in detail about Measures of central tendency.
(Or)
4. a) Histograms
b) Cumulative frequency curve

Unit III

5. Write about the regression analysis.
(Or)
6. a) Standard error
b) Moments

Unit IV

7. Give a detail account of probability and distributions.
(Or)
8. a) Multivariate analysis
b) ANCOVA

Unit V

9. Explain about computer applications in stock assessment.
(Or)
10. a) Predictive models
b) Pedigree analysis

M.SC. DEGREE EXAMINATION
Marine Biology and Fisheries
Second Semester
Estuaries and Coastal Zone Management
(Effective from the admitted batch 2022-2023)

Answer all questions.
All questions carry equal marks.

Time: 3 hrs

Max. Marks: 70

Unit - 1

1. Discuss the physical parameters operating in the estuarine ecosystem
- Or
2. a. H₂ S in estuaries
b. positive estuary

Unit - II

3. Give an account of the distribution of mangroves in India. Describe the special features of mangroves.

Or

4. a. Conservation measures of estuarine birds
b. Estuarine food web

Unit - III

5. Explain the Coastal Zone Management strategies with reference to living resources of the oceans.

Or

6. a. applications of remote sensing to oceanography
b. Discuss the threats to shellfish resources and suggest management strategies

Unit - IV

7. Discuss the IUCN Criteria for keeping wild life in the Red-list. Give an account of wildlife protection act.

Or

8. a. *In-Situ and Ex-Situ* conservation methods.
b. Marine Protected Areas in India and abroad

Unit – V

9. What are the elements present in the Geographic Information System and GPS. Add a note on their applications in the Coastal Zone Management.

or

10. a. Write an essay on the Law of the Seas.
b. Conflict management in implementation of conservation activities

M.SC. DEGREE EXAMINATION
Marine Biology and Fisheries
Second Semester
Biology of Marine Organisms
(Effective from the admitted batch 2022-2023)

Answer all questions.
All questions carry equal marks.

Time: 3 hrs

Max. Marks: 70

Unit – 1

1. Give an account of feeding mechanisms in the marine gastropods quoting suitable examples. or
2. a. Prey and predator relationships
b. Excretion in Polychaetes

Unit - II

3. Describe the factors affecting respiration in marine animals
or
4. a. Describe the respiratory organs in bivalves
b. Give an account on osmoregulatory mechanism.

Unit - III

5. Write an essay on bioluminescence in marine organisms, discussing its biological significance.
or
6. a. Describe the various pigments present in plants in the marine ecosystem.
b. Give an account of chromatophores in the colour changes of marine organisms.

Unit - IV

7. Write an essay on the endogenous rhythms in marine organisms giving examples of species of organisms.
or
8. a. Give an account of the structure of nerve cell and its function.
b. Describe the sense organs and their functions in marine organisms.

Unit - V

9. Give an account of the factors effecting the reproduction in marine organisms.
or
10. a. Describe semelparity and iteroparity giving suitable examples.
b. Describe different gonadal stages in shrimp

M.SC. DEGREE EXAMINATION
Marine Biology and Fisheries
Second Semester
Fish Physiology
(Effective from the admitted batch 2022-2023)

Time: 3 hrs.

Max. Marks: 70

Answer all the questions.
All questions carry equal marks

Unit I

1. Give an account on digestion of carbohydrates, proteins and lipids in fish.
(Or)
- 2 a) Digestive enzymes
b) Digestive system of fish

Unit II

3. Explain in detail about respiration in fish.
(Or)
4. a) Chloride cells
b) Respiratory pigments

Unit III

5. Write about the cardiovascular system in fish.
(Or)
6. a) Blood circulation
b) Hemolymph pigments

Unit IV

7. Give a detail account of the physiology of reproduction.
(Or)
8. a) Oogenesis,
b) Spermatogenesis

Unit V

9. Give an account of neuro-secretions in shell fish.
(Or)
10. a) Pineal gland
b) Growth in shrimps

M.Sc. Degree Examination
Marine Biology and Fisheries
Second Semester
Fishery Science
(Effective from the admitted batch of 2022-2023)

Time: 3 Hrs.

Max Marks: 70

Answer all questions.
All questions carry equal marks.

Unit – 1

1. Describe the classification of fishes based on zonation.

(Or)

2. a) Elasmobranchs
b) Molluscs

Unit – II

3. Describe the various factors limiting abundance of stocks

(Or)

4. a) pre and post stock management
b) Stock enhancement

Unit – III

5. Describe length weight relationship.

(Or)

6. a) Growth
b) Recruitment

Unit – IV

7. Describe the life history of Malabar sole.

(Or)

8. a) Oil sardines
b) Food and feeding habits

Unit – V

9. Write notes on age determination in fishes.

(Or)

10. a) Migration in fishes
b) Marking

M.Sc. Degree Examination
Marine Biology and Fisheries
Third Semester
Fishing Technology and Fishery Management
(Effective from the admitted batch of 2022-2023)

Time: 3 Hrs.

Max Marks: 70

Answer all questions.
All questions carry equal marks.

Unit – 1

1. Describe the classification of boats.

(Or)

2. a) Purse seines
b) Trawl nets

Unit – 1I

3. Write notes on demersal fishing

(Or)

4. a) Turtle extruder device
b) Stock size

Unit – 1II

5. Write notes on potential fishing zones.

(Or)

6. a) Code of conduct
b) Control measures of fishing output

Unit – 1V

7. Write an essay on mesh size regulation

(Or)

8. a) Catch quota
b) Closed fishing areas

Unit – V

9. Describe the various management techniques to regulate over fishing.

(Or)

10. a) SCUBA
b) Buoy

M.Sc. Degree Examination
Marine Biology and Fisheries
Third Semester
Aquaculture
(Effective from the admitted batch of 2022-2023)

Time: 3 Hrs.

Max Marks: 70

Answer all questions.
All questions carry equal marks.

Unit-I

1. Define the aquaculture and write notes on its importance.

Or

2. a) Present status of aquaculture
b) Emerging trends in aquaculture

Unit-II

3. Describe various type pens and its operations in aquaculture.

Or

4. a) Ponds
b) Soil characteristics and suitability

Unit-III

5. Give a detail account of Integrate multi trophic aquaculture.

Or

6. a) Mono-species culture
b) Aquaculture equipment

Unit-IV

7. Describe the various culture practices of mussels.

Or

8. a) Milkfish
b) Seed production in shrimp

Unit-V

9. Give a detail account of Agar yielding sea weed.

Or

10. a) Life cycle of *Ulva fasciata*
b) Breed improvement in sea weeds

M.Sc. Degree Examination
Marine Biology and Fisheries
Third Semester
Fish Nutrition and Feed Technology
(Effective from the admitted batch of 2022-2023)

Time: 3 Hrs.

Max Marks: 70

Answer all questions. All questions carry equal marks

Unit – 1

1. Describe the nutritional requirements of finfish and shell fish.

(Or)

2. a) Vitamins
b) Classification of carbohydrates

Unit – 1I

3. Write notes on energy requirements of fishes.

(Or)

4. a) Protein sparing effect
b) Optimal forage theory

Unit – 1II

5. Describe the nutritional deficiency diseases of finfish and shell fish.

(Or)

6. a) Microbial toxins
b) Anti metabolites

Unit – 1V

7. Write notes on high energy feeds.

(Or)

8. a) Probiotics
b) Feed storage

Unit – V

9. Write notes on supplementary feed theory.

(Or)

10. a) Ration size
b) Feeding methods

M.Sc. Degree Examination
Marine Biology and Fisheries
Third Semester
Marine Pollution and Bio-deterioration
(Effective from the admitted batch of 2022-2023)

Time: 3 Hrs.

Max Marks: 70

Answer all questions.
All questions carry equal marks.

Unit – 1

1. Describe the major transport paths and agents of pollutants into the coastal ocean.
or
2. a. Describe the fate of DDT in the marine environment.
b. Give an account of composition of domestic sewage.

Unit – II

3. Describe the methods adopted to treat the oil pollution.
or
4. a. Explain the disposal systems of heated effluents with illustration.
b. Give an account of the effects of dredging and mining activities on the marine environment.

Unit – III

5. Describe biofilm formation on the man-made marine structures and its role in settlement of bio-foulers.

Or

6. a. What are the factors effecting corrosion, suggest controlling measures
b. Suggest methods to control biofouling.

Unit – IV

7. Discuss the status, objectives and limitations of global environmental monitoring methods.
or
8. a. Emphasize the role of critical pathway approach in the marine pollution monitoring strategy.
b. Mass balance models.

Unit – V

9. Give an account of the various industries which are adopting biotechnological methods to reduce or control pollution.

Or

10. a. Suggest methods to remove nitrogenous wastes from fish processing units.
b. Describe the use of aquatic plants in the treatment of waste water.

M.Sc. Degree Examination
Marine Biology and Fisheries
Fourth Semester
Fish Processing Technology
(Effective from the admitted batch of 2022-2023)

Time: 3 Hrs.

Max Marks: 70

All questions carry equal marks.

Unit – 1

1. Describe the different methods of isolation of bacteria.

(Or)

2. a) Bacteria of sanitary importance
b) Morphology of bacteria

Unit – II

3. Write notes on different types of containers for transportation of fish.

(Or)

4. a) Chemical preservatives
b) Handling of fish

Unit – III

5. Describe the different methods of curing of fish.

(Or)

6. a) Process value calculation
b) Microwave vacuum drying

Unit – IV

7. Describe the different types of freezers used for freezing of fish.

(Or)

8. a) Wrapping
b) Double freezing

Unit – V

9. Write notes on different by products of shell fish.

(Or)

10. a) Preparation of fish oils
b) Food laws in India

M.SC. DEGREE EXAMINATION
Marine Biology and Fisheries
Fourth Semester
Fishery Economics and Extension
(Effective from the admitted batch 2022-2023)

Time: 3 hrs

Max. Marks: 70

Answer all the questions.
All questions carry equal marks.

Unit-I

1.Importance of Fisheries to Indian Economy? How does technological and political factors effect the growth of Fishery sector?

Or

2 (a). Explain Law of variable proportions with graph.
(b). Discuss Product-product relationship?

Unit-II

3. Focus on different strategies for development of Fisheries. Explain the different costs effecting the fishery production?

Or

4(a) State the different demand determinants.
(b). Fishery market system

Unit-III

5. What is a fishery co-operative? Major activities undertaken by fishery cooperatives for promotion of commercial fishing?

Or

6 (a) What are the different risks associated in Fisheries?
(b). Role of NABARD in promotion of fisheries.

Unit-IV

7. What are the different factors effecting the economics of aquaculture? Also focus on socio-economic issues?

Or

8 (a).WTO role in promoting global trade of fisheries.
(b). MPEDA

Unit-V

9. What is Extension? Describe its role in fisheries development? Name different organizations associated with fisheries extension?

Or

10 (a) Natural disasters effecting fisheries
(b) Coping mechanism for disasters in fisheries.

M.Sc. Degree Examination
Marine Biology and Fisheries
Fourth Semester
Aquaculture Biotechnology
(Effective from the admitted batch of 2022-2023)

Time: 3 Hrs.

Max Marks: 70

Answer all questions.
All questions carry equal marks.

Unit-I

1. Describe various techniques of In-Vitro fertilization.

Or

2. a) Cryopreservation
b) Shrimp larval rearing

Unit-II

3. Give a detail account on production of hybrid species and their importance in aquaculture.

Or

4. a) Sex control
b) Polyploidy

Unit-III

5. Give an account on culture of spirulina and its importance in aquaculture.

Or

6. a) Cladocera
b) *Skeletonema*

Unit-IV

7. Write an essay on nutritional diseases in finfish.

Or

8. a) RAPD
b) Fungal diseases in shellfish

Unit-V

9. Give an account of therapeutic proteins in aquaculture.

Or

10. a) Antioxidants
b) Immunostimulants

M.Sc. Degree Examination
Coastal Aquaculture and Marine Biotechnology
First Semester
Oceanography and Marine Biology
(Effective from the admitted batch of 2022-2023)

Time: 3 Hrs.

Max Marks: 70

Answer all questions.
All questions carry equal marks.

Unit – 1

1. Give an account of the heat budget of the oceans,
- Or
2. a. Tides
b. Density of sea water

Unit – II

3. Describe the carbon di- oxide system in the sea water.
- Or
4. a. trace elements
b. salinity

Unit – III

5. Describe the characteristic features of the various ecological divisions of the water column giving suitable examples.
- Or
6. a. define plankton, give an account of the various types of nets used to collect zooplankton.
b. sea ranching

Unit – IV

7. define remote sensing. Give an account of the applications of remote sensing in marine biology and fisheries.
- Or
8. a. law of the seas
b. GIS

Unit – V

9. Name any two National marine research institutes and their contribution to the marine research in India.
- Or
10. a. Woods Hole Institute of Oceanography
b. National Oceanography and Atmospheric Administration

M.Sc. Degree Examination
Coastal Aquaculture and Marine Biotechnology
First Semester
Finfish Culture
(Effective from the admitted batch of 2022-2023)

Time: 3 Hrs.

Max Marks: 70

Answer all questions.
All questions carry equal marks.

Unit-I

1. Give an account of Global Aquaculture Scenario.

Or

2. a) Importance of Aquaculture
b) Emerging trends in aquaculture

Unit-2

3. Describe the biology and life cycle of cobia.

Or

4. a) Salmons
b) Tilapia

Unit-III

5. Describe various methods of eradication of weed and predatory finfishes.

Or

6. a) Pens
b) Cages

Unit-IV

7. Give an account on culture practices of yellow tail.

Or

8. a) Organic farming
b) Polyculture

Unit-V

9. Give an account of marketing and economics of cultured finfish.

Or

10. a) Harvesting
b) Coastal aquaculture Authority

M.SC. DEGREE EXAMINATION
Coastal Aquaculture and Marine Biotechnology
First Semester
Crustacean Farming
(Effective from the admitted batch 2022-2023)

Time: 3 hrs.

Max. Marks: 70

Answer all the questions.
All questions carry equal marks.

Unit I

1. Give an account on scope and importance of crustacean farming in India.
(Or)
2. a) Production and utilization
b) Emerging trends

Unit II

3. Explain in detail about the biology of *Penaeus vannamei*.
(Or)
4. a) *Scylla serrata*
b) *Panilurus homarus*

Unit III

5. Write about the different types of feeds used in aquaculture.
(Or)
6. a) Feed ingredients
b) Nutrition quality

Unit IV

7. Write about the different types of farming practices.
(Or)
8. a) Intensive culture
b) Ultra-intensive

Unit V

9. Write about re-circulatory system (RAS).
(Or)
10. a) Cage culture
b) Rice fields

M.SC. DEGREE EXAMINATION
Coastal Aquaculture and Marine Biotechnology
First Semester
Aquaculture Engineering
(Effective from the admitted batch 2022-2023)

Time: 3 hrs

Max. Marks: 70

Answer all the questions.
All questions carry equal marks.

Unit-I

1. Write an essay on Soil water relationships

Or

2. A) Soil profile
B) Soil texture

Unit-II

3. Describe the method of site measurement by chain

Or

4. A) Earth work estimations
B) Magnetic prism compass

Unit-III

5. Write an essay on the properties of fluids

Or

6. A) Engineering properties of materials
B) Types of tides

Unit-IV

7. What are the requirements for establishment of a fish hatchery of 40 million production capacity

Or

8. A) Raceways B) Aerators

Unit-V

9. Write an essay on different equipment used in water recirculatory systems

Or

10. A) Ozoniser
B) DO meter

M.SC. DEGREE EXAMINATION
Coastal Aquaculture and Marine Biotechnology
Second Semester
Molluscan and Seaweed Farming
(Effective from the admitted batch 2022-2023)

Time: 3 hrs.

Max. Marks: 70

Answer all the questions.
All questions carry equal marks.

Unit-I

1. Give an account of present status of molluscan farming.
- Or
2. a) Life cycle of clams
b) Life cycle of mussel

Unit-II

3. Describe the life cycle of *Ulva* sps.
- Or
4. a) Present status of sea weeds
b) *Sargassum tenerrimum*

Unit-III

5. Describe the various culture practices of Clams and cockles.
- Or
6. a) Cephalopods
b) Pearl production

Unit-IV

7. Describe the various methods of integration of sea weed culture with other farming.
- Or
8. a) Agar yielding sea weeds
b) Green sea weeds

Unit-V

9. Give a detail account of production and economics of molluscs.
- Or
10. a) Harvesting
b) By-products of sea weeds

M.Sc. Degree Examination
Coastal Aquaculture and Marine Biotechnology
Second Semester
Soil and water quality management in Aquaculture
(Effective from the admitted batch of 2022-2023)

Time: 3 Hrs.

Max Marks: 70

Answer all questions.
All questions carry equal marks.

Unit – 1

1. Describe the physic-chemical properties of soil.

(Or)

2. a) Physical properties of water
b) Importance of soil and water

Unit – 1I

3. Describe sulfur cycle and its importance in aquaculture.

(Or)

4. a) Soil standards in culture systems
b) Role of micro organisms in carbon cycle

Unit – 1II

5. Write notes on bio- fertilizers.

(Or)

6. a) Primary production
b) Use of treated sewage

Unit – IV

7. Describe the process of sludge disposal.

(Or)

8. a) Aeration and aerators
b) Ozonization

Unit – V

9. Describe the various methods to control aquatic weeds.

(Or)

10. a) Eutrophication
b) Dinoflagellates

M.SC. DEGREE EXAMINATION
Coastal Aquaculture and Marine Biotechnology
Second Semester
Seed Production and Hatchery Management
(Effective from the admitted batch 2022-2023)

Time: 3 hrs.

Max. Marks: 70

Answer all the questions.
All questions carry equal marks.

Unit I

1. Give an account on brood stock management of shrimp.
(Or)
2. a) SPR brood stock certification
b) Maturation

Unit II

3. Explain in detail about wild seed collection of fin fish.
(Or)
4. a) Sea weeds
b) Pearl oyster

Unit III

5. Write about hatchery management of sea bass.
(Or)
6. a) Crabs
b) Mussels

Unit IV

7. Give a detail account of nutritional requirements of shrimp larvae.
(Or)
8. a) Micro encapsulated feed
b) Artemia

Unit V

9. Explain about harvesting, packing and transport of fish larvae.
(Or)
10. a) Seed quality management
b) Marketing and economics

M.SC. DEGREE EXAMINATION
Coastal Aquaculture and Marine Biotechnology
Second Semester
Marine Microbiology
(Effective from the admitted batch 2022-2023)

Time: 3 hrs.

Max. Marks: 70

Answer all the questions.
All questions carry equal marks.

Unit-I

1. Describe the principle and working mechanism of Scanning Electron Microscope

Or

2. A) Magnification B) Resolving power

Unit-II

3. Classify Marine microalgae up to classes with examples

Or

4. A) Halophiles B) Barophiles

Unit-III

5. Give an account of Classification of animal viruses

Or

6. A) Bacterial growth curve B) Culture media of Protozoans

Unit-IV

7. Write an essay on sterilization techniques used in microbiology

Or

8. A) Microbes in frozen fish B) Quality indices

Unit-V

9. Write an essay on the planning and implementation of HACCP systems

Or

10. A) ISO 22000 B) Traceability issues

M.SC. DEGREE EXAMINATION
Coastal Aquaculture and Marine Biotechnology
Third Semester
Biochemistry and Fish Nutrition
(Effective from the admitted batch 2022-2023)

Time: 3 hrs

Max. Marks: 70

Answer all the questions.
All questions carry equal marks.

Unit I

1. Give an account on metabolism of carbohydrates.

(Or)
2. a) Enzyme immobilization
b) Factors affecting enzyme action

Unit II

3. Explain in detail about the nutritional requirements of cultivable finfish.

(Or)
4. a) Feed formulations
b) Feed additives

Unit III

5. Write about various types of feeds.

(Or)
6. a) Compact pellet feed
b) Floating and slow sinking pellet feeds

Unit IV

7. Discuss about the equipment used in feed manufacturing.

(Or)
8. a) Drying
b) Crumbling

Unit V

9. Write about feed storage.

(Or)
10. a) Feed economics and evaluation
b) FCR & FCE

M.SC. DEGREE EXAMINATION
Coastal Aquaculture and Marine Biotechnology
Third Semester
Genetics in Aquaculture
(Effective from the admitted batch 2022-2023)

Time: 3 Hrs.

Max. Marks: 70

Answer all the questions.
All questions carry equal marks.

Unit-I

1. Write an essay on the chromosome theory of inheritance

Or

2. A) Dihybrid cross B) Non- Mendelian inheritance

Unit-II

3. Write an essay on the sex determination in fin fish

Or

4. A) Sex reversal B) Transgenesis

Unit-III

5. Write an essay on fish genomics

Or

6. A) Cryopreservation B) In-vitro fertilization

Unit-IV

7. Give an account of inbreeding and cross breeding of fishes

Or

8. A) Heterosis B) Introgression

Unit-V

9. Write an account of Allozymes and Microsatellites

Or

10. A) ESTs and SNPs B) Mitochondrial DNA

M.Sc. DEGREE EXAMINATION
Coastal Aquaculture and Marine Biotechnology
Third Semester
Molecular Biology
(Effective from the admitted batch 2022-2023)

Time: 3 hrs.

Max. Marks: 70

Answer all the questions.
All questions carry equal marks.

Unit-I

1. Write a detailed account of Meiosis with suitable illustrations

Or

2. A) Write about structure of biological membranes
B) Explain active transport mechanism that occurs in cell membranes

Unit-II

3. Describe Watson and Crick model of DNA and write the differences between structures of DNA and RNA

Or

4. A) What are the various types of DNA damage? Give a brief account of repair mechanisms.
B) Explain the terms T_m , hyperchromicity of DNA

Unit-III

5. Explain the process of Post transcriptional modifications in eukaryotes

Or

6. A) What is genetic code
B) Explain the structure and types of ribosomes

Unit-IV

7. What is DNA recombination? Explain the molecular models of homologous and site-specific recombination.

Or

8. A) What are mutations?
B) Write an account on various mutagens responsible for mutations

Unit-V

9. Write an essay on Operon concept with atleast two examples in prokaryotes

Or

10. A) What are various transacting factors
B).Give a detailed account of environmental regulation of gene expression

M.Sc. Degree Examination
Coastal Aquaculture and Marine Biotechnology
Third Semester
Marine Pollution and Bio-deterioration
(Effective from the admitted batch of 2022-2023)

Time: 3 Hrs.

Max Marks: 70

Answer all questions.
All questions carry equal marks.

Unit – 1

1. Describe the major transport paths and agents of pollutants into the coastal ocean.

or

2. a. Describe the fate of DDT in the marine environment.
b. Give an account of composition of domestic sewage.

Unit – II

3. Describe the methods adopted to treat the oil pollution.

or

4. a. Explain the disposal systems of heated effluents with illustration.
b. Give an account of the effects of dredging and mining activities on the marine environment.

Unit – III

5. Describe biofilm formation on the man-made marine structures and its role in settlement of bio-foulers.

Or

6. a. What are the factors effecting corrosion, suggest controlling measures
b. Suggest methods to control biofouling.

Unit – IV

7. Discuss the status, objectives and limitations of global environmental monitoring methods.

or

8. a. Emphasize the role of critical pathway approach in the marine pollution monitoring strategy.
b. Mass balance models.

Unit – V

9. Give an account of the various industries which are adopting biotechnological methods to reduce or control pollution.

Or

10. a. Suggest methods to remove nitrogenous wastes from fish processing units.
b. Describe the use of aquatic plants in the treatment of waste water.

M.Sc. DEGREE EXAMINATION
Coastal Aquaculture and Marine Biotechnology
Fourth Semester
Fish Pathology and Immunology
(Effective from the admitted batch 2022-2023)

Time: 3 hrs.

Max. Marks: 70

Answer all the questions.
All questions carry equal marks.

1. Write an essay on the viral diseases of cultured fish

Or
2. A) Histopathology
B) Nutritionally induced diseases in fish
3. Write an essay on Various types of vaccines

Or
4. A) RNAi technology
B) Biosecurity measures in Aquaculture

Or
5. Write an essay on the phylogeny of immune system

Or
6. A) Non specific immune system B) Complement system
7. Write an essay on the immunological tolerance

Or
8. A) Antigen processing B) Haptens
9. Write an essay on Hypersensitivity reactions of Type I and II

Or
10. A) Immune genes
B) Auto immune disorders

M.Sc. DEGREE EXAMINATION
Coastal Aquaculture and Marine Biotechnology
Fourth Semester
Marine Biotechnology
(Effective from the admitted batch 2022-2023)

Time: 3 hrs.

Max. Marks: 70

Answer all the questions.
All questions carry equal marks.

Unit – 1

1. Describe the design and features of bioreactor and the types of bioreactors used in the industry.

or

2. a. Biofertilizers.
b. Isolation of extra nuclear DNA.

Unit – II

3. Give an account of gene modification techniques.

or

4. a. Explain Southern blotting technique and its application.
b. What is colony hybridization. Describe the technique.

Unit – III

5. Describe Sanger's method of DNA sequencing. Discuss its merits and demerits.

Or

6. a. PCR technique
b. Allopheny.

Unit – IV

7. Define stemness. Describe culture procedure of stem cells and their application in animal health.

or

8. a. Somatic Hybridization
b. Protoplast Fusion

Unit – V

9. Give an account of information networks and their role in the bioinformatic studies.

Or

10. a. FASTA and BLAST.
b. Phylogenetic Analysis.

M.Sc. DEGREE EXAMINATION
Coastal Aquaculture and Marine Biotechnology
Fourth Semester
Bioactive Marine Natural Products
(Effective from the admitted batch 2022-2023)

Time: 3 hrs.

Max. Marks: 70

Answer all the questions.
All questions carry equal marks.

Unit-I

1. Describe the principle and working mechanism of Inductively Coupled plasma Spectrophotometer

Or

2. A) Flame photometer B) Colorimeter

Unit-II

3. Describe the principle and working mechanism of NMR

Or

4. A) Paper chromatography B) Ion exchange chromatography

Unit-III

5. Write an essay on the antibiotic compounds of marine origin

Or

6. A) Cytotoxic compounds B) Analgesic compounds of marine origin

Unit-IV

7. Write an essay on marine peptides and their applications

Or

8. A) Marine toxins B) Green fluorescent protein

Unit-V

9. Write an essay on the classification of antibiotics with examples

Or

10. A) Biotransformation B) Excretion of drugs

M.Sc. Degree Examination
Marine Biotechnology
First Semester
Oceanography and Marine Biology
(Effective from the admitted batch of 2022-2023)

Time: 3 Hrs.

Max Marks: 70

Answer all questions.
All questions carry equal marks.

Unit – 1

1. Give an account of the heat budget of the oceans,
- Or
2. a. Tides
b. Density of sea water

Unit – II

3. Describe the carbon di- oxide system in the sea water.
- Or
4. a. trace elements
b. salinity

Unit – III

5. Describe the characteristic features of the various ecological divisions of the water column giving suitable examples.
- Or
6. a. define plankton, give an account of the various types of nets used to collect zooplankton.
b. sea ranching

Unit – IV

7. define remote sensing. Give an account of the applications of remote sensing in marine biology and fisheries.
- Or
8. a. law of the seas
b. GIS

Unit – V

9. Name any two National marine research institutes and their contribution to the marine research in India.
- Or
10. a. Woods Hole Institute of Oceanography
b. National Oceanography and Atmospheric Administration

M.Sc. DEGREE EXAMINATION
Marine Biotechnology
First Semester
Biochemistry
(Effective from the admitted batch 2022-2023)

Time: 3 hrs.

Max. Marks: 70

Answer all the questions.
All questions carry equal marks

1. Describe the process of Glycolysis in detail with a note on key regulatory steps of the Process

Or

2. A) Chemical bonds in biochemistry
B) Gluconeogenesis

3. Give a detailed account of beta oxidation of fatty acids

Or

4. A) Structure and properties of proteins
B) Properties of lipids

5. Write an essay on proximate composition of fish and shellfish

Or

6. A) Non protein nitrogenous compounds in fish and shell fish
B) Equilibria and coupled processes in bioenergetics

7. What are Vitamins? Write an account on various types of Vitamins and their properties.

Or

8. A) Prostaglandins B) Interferons

9. Describe the structure of biological membranes and their functions.

Or

10. A) Transport of biomolecules across cell membranes
B) Biochemical pathway of photosynthesis

M.Sc. Degree Examination
Marine Biotechnology
First Semester
Reproductive Physiology and Endocrinology
(Effective from the admitted batch of 2022-2023)

Time: 3 Hrs.

Max Marks: 70

Answer all questions.
All questions carry equal marks.

Unit – 1

1. Describe the anatomy and histology of gonads of shellfish.

(Or)

2. a) Oogenesis
b) Gonadal steroidogenesis

Unit – 1I

3. Describe sex differentiation and write notes on factors affecting sex differentiation.

(Or)

4. a) Hermaphroditism
b) Secondary sex characters

Unit – 1II

5. Describe the process of artificial insemination in finfish.

(Or)

6. a) Fertilization in finfish and shellfish
b) Pheromones

Unit – 1V

7. Describe the role of pineal gland in regulating reproduction.

(Or)

8. a) hypothalamo – hypophyseal system
b) Pituitary gland

Unit – V

9. Cryopreservation of gametes.

(Or)

10. a) Applications of biotechnology for gonad development
b) Invitro fertilization

M.Sc. Degree Examination
Marine Biotechnology
First Semester
Molecular Biology
(Effect from the admitted batch of 2022-2023)

Time: 3hrs

Max Marks: 70

Answer all the questions
All questions carry equal marks.

Unit-I

1. Write a detailed account of Mitosis with suitable illustrations

Or

2. A) Describe the cell structure of eukaryotes
B) Describe the structure of chromosome

Unit-II

3. Explain the mechanism of DNA replication in eukaryotes

Or

4. A) Give a brief account of DNA repair mechanisms.
B) Explain homologous and site specific DNA recombination methods

Unit-III

5. Explain the process of transcription in prokaryotes with a note on regulatory elements

Or

6. A) Describe the structure of tRNA
B) What are molecular chaperones?

Unit-IV

7. Write an essay on Lac operon

Or

8. A) Give a detailed account of DNA methylation.
C) What are transacting factors?

Unit-V

9. Give a detailed account of environmental regulation of gene expression

Or

10. A) What are mutations? Give an account of physical and chemical mutagens
B) Give a brief account of tumour suppressor genes

M.Sc. Degree Examination
Marine Biotechnology
Second Semester
Coastal Aquaculture
(Effective from the admitted batch of 2022-2023)

Time: 3 Hrs.

Max Marks: 70

Answer all questions.
All questions carry equal marks.

Unit-I

1. Write a detail notes on importance of Aquaculture.
- OR
2. a) Overview of aquaculture
b) Global aquaculture production

Unit-II

3. Describe the design and construction of ponds.
- Or
4. a) Semi-intensive culture
b) Race-ways

Unit-III

5. Give an account of biology and life cycle of *Penaeus monodon*.
- Or
6. a) *Scylla serrate*
b) *Crossostrea madrasensis*

Unit-IV

7. Describe the various culture practices of mulltes.
- Or
8. a) Culture of Cephalopods
b) Culture of fresh water prawn

Unit-V

9. Describe the importance of Sea weeds.
- Or
10. a) Algin yielding sea weeds
b) Life cycle of *Gracilaria carticata*

M.Sc. DEGREE EXAMINATION
Marine Biotechnology
Second Semester
Fish Genetics
(Effective from the admitted batch 2022-2023)

Time: 3 hrs.

Max. Marks: 70

Answer all the questions.
All questions carry equal marks.

Unit-I

1. Write an essay on the chromosomal theory of inheritance

Or

2. A) Mitochondrial inheritance B) Sex linked genes in fish

Unit-II

3. Write an essay on chromosomal polymorphism

Or

4. A) Gynogenesis B) Super males

Unit-III

5. Write an essay on population genomics

Or

6. A) Nei's genetic distance B) Genetic drift
- 7.

Unit-IV

8. Write an essay on genetic diversity and conservation

Or

9. A) Allozymes B) QLT mapping

Unit-V

10. Write an essay on Fluorescence In situ Hybridization (FISH)

Or

11. A) Sister chromatid exchange B) MNT

M.Sc. DEGREE EXAMINATION
Marine Biotechnology
Second Semester
Marine Microbiology and Microbial Technology
(Effective from the admitted batch 2022-2023)

Time: 3 hrs.

Max. Marks: 70

Answer all the questions.
All questions carry equal marks.

Unit-I

1. Write an essay on the principle and working mechanism of phase contrast microscope

Or

2. A) Classification of fungi B) Thermophiles and Psychrophiles

Unit-II

3. Write an essay on preservation methods of Bacterial cultures

Or

4. A) Chemical methods of sterilization B) Culture methods of fungi

Unit-III

5. Write an essay on waterborne pathogens of public health importance.

Or

6. A) Salient features of Bioreactors B) Fermentation

Unit-IV

7. Write an essay on the role of microbes in fish preservation

Or

8. A) Indices of fish quality B) Total quality management in Sea food processing

Unit-V

9. Write an essay on planning and control of HACCP systems

Or

10. A) EIA B) FSSAI

M.Sc. DEGREE EXAMINATION
Marine Biotechnology
Second Semester
Cell and Tissue Culture
(Effective from the admitted batch 2022-2023)

Time: 3 hrs.

Max. Marks: 70

Answer all the questions.
All questions carry equal marks.

Unit I

1. Give an account on overview of tissue culture.

(Or)

2. a) Culture media
b) Equipments and materials for tissue culture

Unit II

3. Explain in detail about the cell lines.

(Or)

4. a) Cytotoxic assay
b) Measuring parameters of growth

Unit III

5. Write about the development of cell lines of shrimp.

(Or)

6. a) Organ culture
b) Pure cultures

Unit IV

7. Discuss about the stem cells.

(Or)

8. a) Fibroblasts
b) Role of proto-oncogenes

Unit V

9. Write about the industrial applications of tissue culture.

(Or)

10. a) Apoptosis
b) Marine micro algae

M.Ss. DEGREE EXAMINATION
Marine Biotechnology
Third Semester
Health Management in Aquaculture
(Effective from the admitted batch 2022-2023)

Time: 3 hrs

Max. Marks: 70

Answer all the questions.
All questions carry equal marks

Unit-I

1. Describe the Host-Pathogen – Environment relationship

Or

2. A) Environmental Stress B) Inflammation

Unit-II

3. Write an essay on Bacterial diseases of shrimp

Or

4. A) Epizootiology B) Nutritionally induced diseases

Unit-III

5. Write an essay on histopathological techniques employed in disease diagnosis

Or

6. A) Disease surveillance B) Molecular diagnostic techniques

Unit-IV

7. Write an essay on the chemotherapeutic agents used in disease management

Or

8. A) Adjuvants B) Immunostimulants

Unit-V

9. Write an essay on the abuse of antibiotics in aquaculture

Or

10. A) Fish quarantine system B) SPF and SPR stocks

M.SC. DEGREE EXAMINATION
Marine Biotechnology
Third Semester
Enzymology and Enzyme Technology
(Effective from the admitted batch 2022-2023)

Time: 3 hrs.

Max. Marks: 70

Answer all the questions.
All questions carry equal marks.

Unit I

11. Give an account on classification of enzymes.
(Or)

12. a) Enzyme specificity
b) Factors affecting enzyme action

Unit II

13. Explain in detail about the reversible and irreversible inhibition of enzymes.
(Or)

14. a) Mechanism of enzyme action
b) Activation energy & Active site

Unit III

15. Write about the regulation of enzyme activity.
(Or)

16. a) Glutamine synthetase
b) Haemoglobin

Unit IV

17. Discuss about the extraction and purification of enzymes.
(Or)

18. a) Membrane bound enzymes
b) Enzyme storage

Unit V

19. Write about biosensors and their applications.
(Or)

20. a) Synthetic enzymes
b) Isozymes

M.Sc. Degree Examination
Marine Biotechnology
Third Semester
Marine Pollution and Bio-deterioration
(Effective from the admitted batch of 2022-2023)

Time: 3 Hrs.

Max Marks: 70

Answer all questions.
All questions carry equal marks.

Unit – 1

1. Describe the major transport paths and agents of pollutants into the coastal ocean.
or
2. a. Describe the fate of DDT in the marine environment.
b. Give an account of composition of domestic sewage.

Unit – II

3. Describe the methods adopted to treat the oil pollution.
or
4. a. Explain the disposal systems of heated effluents with illustration.
b. Give an account of the effects of dredging and mining activities on the marine environment.

Unit – III

5. Describe biofilm formation on the man-made marine structures and its role in settlement of bio-foulers.

Or

6. a. What are the factors effecting corrosion, suggest controlling measures
b. Suggest methods to control biofouling.

Unit – IV

7. Discuss the status, objectives and limitations of global environmental monitoring methods.
or
8. a. Emphasize the role of critical pathway approach in the marine pollution monitoring strategy.
b. Mass balance models.

Unit – V

9. Give an account of the various industries which are adopting biotechnological methods to reduce or control pollution.

Or

10. a. Suggest methods to remove nitrogenous wastes from fish processing units.
b. Describe the use of aquatic plants in the treatment of waste water.

M.SC. DEGREE EXAMINATION
Marine Biotechnology
Fourth Semester
Applications of Biotechnology in Aquaculture
(Effective from the admitted batch 2022-2023)

Time: 3 hrs.

Max. Marks: 70

Answer all the questions.
All questions carry equal marks.

Unit I

1. Give an account on role of biotechnology in aquaculture.
(Or)
2. a) Probiotics
b) Growth promoters

Unit II

3. Explain in detail about plant live feeds.
(Or)
4. a) Artemia
b) Artificial feeds

Unit III

5. Write about transgenesis in fish.
(Or)
6. a) Polyploidy
b) In-breeding

Unit IV

7. Discuss about synthetic hormones.
(Or)
8. a) GnRH
b) Antimicrobial peptides

Unit V

9. Write an essay on application nanotechnology in aquaculture.
(Or)
10. a) Single cell proteins
b) Dot-Blot technique

M.Sc. DEGREE EXAMINATION
Marine Biotechnology
Fourth Semester
Genetic Engineering
(Effective from the admitted batch 2022-2023)

Time: 3 hrs.

Max. Marks: 70

Answer all the questions.
All questions carry equal marks

Unit I

1. Give an account on probes used in genetic engineering.
(Or)
2. a) Autoradiography
b) DNA ligases

Unit II

3. Explain in detail about vectors.
(Or)
4. a) DNA foot printing
b) Transposons

Unit III

5. Write about jumping and hopping libraries.
(Or)
6. a) Loop Mediated Isothermal Amplification (LAMP)
b) Transgenic fish

Unit IV

7. Discuss about Next Generation Sequencing.
(Or)
8. a) CRISPER technology
b) Si RNA technology

Unit V

9. Write an essay on BLAST and FASTA.
(Or)
10. a) Microarray analysis
b) Gene bank sequence database

M.Sc. DEGREE EXAMINATION
Marine Biotechnology
Fourth Semester
Bioactive Marine Natural Products
(Effective from the admitted batch 2022-2023)

Time: 3 hrs.

Max. Marks: 70

Answer all the questions.
All questions carry equal marks.

Unit-I

1. Describe the principle and working mechanism of Inductively Coupled plasma Spectrophotometer

Or

2. A) Flame photometer B) Colorimeter

Unit-II

3. Describe the principle and working mechanism of NMR

Or

4. A) Paper chromatography B) Ion exchange chromatography

Unit-III

5. Write an essay on the antibiotic compounds of marine origin

Or

6. A) Cytotoxic compounds B) Analgesic compounds of marine origin

Unit-IV

7. Write an essay on marine peptides and their applications

Or

8. A) Marine toxins B) Green fluorescent protein

Unit-V

9. Write an essay on the classification of antibiotics with examples

Or

10. A) Biotransformation B) Excretion of drugs