

Seat No. : \_\_\_\_\_

**ND-146**

**November-2021**

**B.Sc., Sem.-V**

**303 : Biotechnology  
(Marine Biotechnology)  
(New)**

**Time : 2 Hours]**

**[Max. Marks : 50**

- Instructions :**
- (1) All questions in Section – I carry equal marks.
  - (2) Attempt any **THREE** questions in Section – I.
  - (3) Question – **9** in Section – II is **COMPULSORY**.
  - (4) Draw figures where necessary. Show question number against each answer.
  - (5) Figures in right are marks.

**Section – I**

1. (A) Describe the chemical properties of the ocean in detail. 7  
(B) What is eutrophication ? Discuss problems associated with eutrophication. 7
2. (A) Write a note on seaweeds and its applications. 7  
(B) Describe Mangrove ecosystem in detail. 7
3. (A) Write significance of ocean crustaceans stating suitable examples. 7  
(B) Discuss Mineral resources from marine water. 7
4. (A) What are trace elements ? Write significance of trace elements obtained from oceans. 7  
(B) Give importance of Fishes and reptiles as marine resources. 7
5. (A) Write a detailed note on antifreeze protein and its applications. 7  
(B) Discuss some commercial enzymes and lipids isolated from ocean. 7
6. (A) Discuss two commercial bioactive compounds and its applications from ocean. 7  
(B) Elaborate Green Fluorescence protein from ocean and its applications. 7

7. (A) Write a short note on health management in Aquaculture. 7  
(B) Explain Bioremediation techniques to remove marine pollutants. 7
8. (A) Write a brief note on Pearl culture. 7  
(B) Explain Biosensors and its applications. 7

**Section – II**

9. Answer the following : (any **Eight**) 8
- (1) Plants and animals that live on the ocean floor are \_\_\_\_\_.  
(a) benthos (b) nekton  
(c) plankton (d) diatoms
- (2) The amount of dissolved solids present in the water  
(a) salinity (b) chlorine  
(c) nitrogen (d) density
- (3) Which of the following organisms is an example of nekton ?  
(a) Lobster (b) Dolphin  
(c) Clam (d) Seastar
- (4) Antifreeze proteins or AFPs enable organisms that possess it to  
(a) Survive high temperatures  
(b) Survive extreme pressure  
(c) Survive subzero temperatures  
(d) None of the above
- (5) Non-calcareous fouling organisms are Seaweeds, Algae and \_\_\_\_\_.  
(a) Viruses (b) Bacterial Films  
(c) Rodents (d) Fungi
- (6) The following factors play vital role in corrosion process :  
(a) Temperature (b) Solute concentration  
(c) Both (d) None



- (14) The Kyoto Protocol came into action in :
- (a) 2007 (b) 1992  
(c) 2000 (d) 2005
- (15) Which of the following fishes do not have a swim bladder ?
- (a) Puffers (b) Bowfin  
(c) Tuna (d) Sturgeons
- (16) Spot the WRONG match about algae and their carbohydrate reserves:
- (a) Euglenophyceaezparamylon  
(b) Chlorophyceaez starch  
(c) Bacillariophyceaez fats and lipids  
(d) Phaeophyceaez Floridian starch
- (17) Which of the following zones has the highest percentage of marine habitats ?
- (a) Abyssalpelagic (b) Mesopelagic  
(c) Epipelagic (d) Hadalpelagic
- (18) Intertidal zones :
- (a) zone between highest high tide and lowest high tide  
(b) zone between lowest high tide and highest low tide  
(c) zone between lowest high tide and lowest low tide  
(d) zone between highest high tide and lowest low tide
- (19) Which of the following fishes have a skeleton that is entirely made up of cartilage ?
- (a) Puffers (b) Sharks  
(c) Ray-fins (d) Sturgeons
- (20) Which of the following benthic zones is the deepest zone ?
- (a) Neritic zone (b) Littoral zone  
(c) Pelagic zone (d) Hadal zone

(21) Eutrophication :

- (a) leads to decreased biomass.
- (b) is essential for the growth of fish.
- (c) inhibition of phytoplankton growth.
- (d) is responsible for algal bloom.

(22) The most abundant photosynthetic organism in the marine environment (ocean) :

- (a) Prochlorococcus
  - (b) Corallina
  - (c) Nereocystis
  - (d) Gelidium
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- Instructions :** (1) Draw figures wherever necessary.  
(2) Write question number against each answer.  
(3) Answer any **three** out of initial **eight** main questions. Question – **9** is compulsory.

**Section – I**

- |    |  |   |
|----|--|---|
| 1. | (A) Write physical and chemical properties of oceanic water.                                       | 7 |
|    | (B) Discuss composition of sea water.  | 7 |
| 2. | (A) Describe structural features and significance of sea weeds.                                    | 7 |
|    | (B) Explain salient features of mangrove ecosystem and its importance.                             | 7 |
| 3. | (A) Describe chemical resources of marine origin.  | 7 |
|    | (B) Discuss importance of planktons to marine ecosystem.   | 7 |
| 4. | (A) Write a brief note on marine mammals.  | 7 |
|    | (B) Discuss marine molluscus with examples.  | 7 |
| 5. | (A) Explain bioactive compounds of marine organisms.   | 7 |
|    | (B) Write about commercial importance of marine polysaccharides.                                   | 7 |
| 6. | (A) Explain in brief about commercial importance of proteins and lipid derived from marine origin. | 7 |
|    | (B) Discuss GFP as novel biomarker.  | 7 |
| 7. | (A) Write a note on fish farming.  | 7 |
|    | (B) Discuss principle and applications of biosensors.  | 7 |
| 8. | (A) Explain biofouling.  | 7 |
|    | (B) Discuss the use of marine algae as a source of single cell protein.                            | 7 |

9. Answer any **eight** of the following :

**8**

- (1) What are estuaries ?
  - (2) Give two applications of sea grasses.
  - (3) Define salinity.
  - (4) What is biological productivity of ocean ?
  - (5) List factors affecting oxygen levels in ocean water.
  - (6) Give two examples of marine fish.
  - (7) What is the importance of performing live resource assessment of oceans ?
  - (8) What is the role of sea turtles ?
  - (9) Write two features of crustaceans.
  - (10) Give two examples of marine vertebrates.
  - (11) Write two applications of antifreeze proteins.
  - (12) What is bioluminescence ?
  - (13) Give two examples of commercial marine enzymes.
  - (14) Name jelly fish which exhibits green fluorescence.
  - (15) What is bioactive compound ? Give example.
  - (16) What is aquaculture ?
  - (17) What is biocorrosion ?
  - (18) Name two barriers in aquaculture.
  - (19) What is pisciculture ?
  - (20) What is environmental remediation ?
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