



**NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY**

FACULTY OF HEALTH, APPLIED SCIENCES AND NATURAL RESOURCES

DEPARTMENT OF NATURAL AND APPLIED SCIENCES

QUALIFICATION: BACHELOR OF SCIENCE	
QUALIFICATION CODE: 07BOSC	LEVEL: 7
COURSE CODE: MAB701S	COURSE NAME: MARINE BIOLOGY 3A
SESSION: JULY 2022	PAPER: THEORY
DURATION: 3 HOURS	MARKS: 100

SUPPLEMENTARY / SECOND OPPORTUNITY EXAMINATION QUESTION PAPER	
EXAMINER (S):	Dr. Edosa Omoregie
MODERATOR:	Dr. Johannes Iitembu

INSTRUCTIONS	
<ol style="list-style-type: none">1. Answer all questions in Section A and Section B.2. Write clearly and neatly.3. Number your answers clearly.	

PERMISSIBLE MATERIAL

Scientific Calculator

THIS QUESTION PAPER CONSIST OF 3 PAGES
(Including this front page)

SECTION A

Answer all questions

Total marks [55]

1. Explain the main reason why water is referred to as a universal solvent. (4)
2. What does the acronym 'PSU' refer to in Marine Science, and what water property does it measure? (2)
3. What is the scientific name of the largest known bacteria that was discovered in Namibian marine waters? Explain the characteristics of this bacteria. (4)
4. Why are nutrient cycles in the marine environment referred to as biogeochemical cycles? (4)
5. Briefly explain the main sources of nitrogen in the marine environment. (4)
6. List the four main sources of organic carbon in the marine environment. (2)
7. With the aid of a chemical equation only, show how primary producers convert inorganic carbon to organic carbon in the marine environment (2)
8. With the use of a chemical equation only, show how the oxidation of sulphur will lead to the reduction of pH in natural water bodies. (3)
9. How do the ratios of NH_4^+ to NH_4OH affect the alkalinity of seawater? (2)
10. What is denitrification? Why is this process a chemical reduction process? (3)
11. How would the ratio of Carbon to Nitrogen (C:N) affect the rate of decomposition of dissolved organic matter in the aquatic environment? (2)
12. Name any two marine dinoflagellates that produce the phytotoxin, saxitoxin. (2)
13. Briefly describe the features of marine foraminiferians. How do they differ structurally from the radiolarians? (4)
14. With reference to organic input, differentiate briefly between oligotrophic and eutrophic aquatic environments. (3)
15. Explain the main benefit of upwelling on the productivity and biodiversity of the marine ecosystem. (2)

16. Explain the main reason why *Salicornia sp* and *Spartina sp* are grouped as salt-marsh plants? (2)
17. Why are marine sponges described as animals on a cellular level of organization? (2)
18. What is the main function of the ostia in marine sponges? (2)
19. What is the main function of the pinacocytes in marine sponges? (2)
20. With reference to structure, what are the main differences between the polyp form and medusa form of the phylum Cnidaria? (4)

SECTION B

Answer all questions

Total marks [45]

21. With reference to photosynthetic and respiratory activities and an appropriate graphic illustration, explain the dynamics of dissolved oxygen and carbon dioxide in open seawater over a 24-hour diurnal period. (15)
22. (a). With reference to body characteristics, movement, respiratory and digestive systems, describe the structure of marine nematodes. (10)
(b). Outline the general characteristics of marine gastropods. (5)
24. With the aid of suitable diagrams, discuss how the elasmobranch and bony fishes regulate their body osmotic pressure in conforming to living in the marine environment. (15)