NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY

FACULTY OF HEALTH AND APPLIED SCIENCES

DEPARTMENT OF NATURAL AND APPLIED SCIENCES

QUALIFICATION: BACHELOR OF SCIENCE	
QUALIFICATION CODE: 07BOSC	**LEVEL:** 7
COURSE CODE: MAB701S	**COURSE NAME:** MARINE BIOLOGY 3A
SESSION: JUNE 2019	**PAPER:** THEORY
DURATION: 3 HOURS	**MARKS:** 100

FIRST OPPORTUNITY EXAMINATION QUESTION PAPER	
EXAMINER (S):	**Prof. Edosa Omoregie**
MODERATOR:	**Dr. Johannes Iitembu**

INSTRUCTIONS
1. Answer all questions 2. Write clearly and neatly 3. Number your answers clearly

PERMISSIBLE MATERIAL

Scientific Calculator

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

Question 1 **[20]**

a) With reference to organic input, briefly differentiate oligotrophic and eutrophic aquatic environments. (2)

b) With the use of graphical illustration, explain the concept of compensation point in sea water due to photosynthesis and respiratory activities of marine biota. (4)

c) List any three factors that affect the transparency of seawater. (3)

d) What is the molar concentration of nitrogen gas in seawater under 1 atmospheric pressure? Given: K_H of nitrogen gas in water = 1639.34 mm Hg /(mol/L). (4)

e) Name any four groups of bacteria that aid the process of denitrification in seawater. (2)

f) Explain how the process of bacterial decomposition in oceanic hypolimnetic waters lead to reduction in dissolved oxygen concentration. (5)

Question 2 **[20]**

a) With the aid of suitable diagrams, briefly explain the structural difference between marine Asconoid and Leuconoid Sponges. (10)

b) With reference to photosynthetic activities and phytoplankton load, briefly explain the diurnal pattern of dissolved oxygen in the aquatic environment. (10)

Question 3 **[20]**

a) Briefly explain morphological and physiological features of the bacteria, *Thiomargarita namibiensis*. (4)

b) What would be the effect of denitrification on seawater pH, justify your answer with the use of a chemical equation. (4)

c) With the aid of appropriate chemical equations and with reference to bacteria involved, explain the processes of nitrogen fixation and nitrification in the marine environment. (12)

Question 4 **[20]**

a) Name any two marine dinoflagellates that produce the phytotoxin, saxitoxin. (2)

b) Briefly describe the main features of marine leuconoid sponges. (3)

c) What are the main structural differences between marine Coccolithophores and Silicoflagellates? (2)

d) Briefly explain the main differences between marine isopods and amphipods. (3)

e) With the aid of suitable diagrams, discuss how the elasmobranch and bony fishes regulate their body osmotic pressure in order to conform to living in the marine environment. (10)

Question 5 **[20]**

a) What are Phycocolloids? Name any two Phycocolloids and their economic importance. (2)

b) Explain the main reason why *Salicornia sp.* and *Spartina sp.* are grouped as salt-marsh plants? (2)

c) With reference to structure and pigmentation, compare and contrast the three Phyla of marine macroalgae. (6)

d) Describe the different types of sexual reproduction in marine macroalgae. (10)