



**NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY**

FACULTY OF HEALTH AND APPLIED SCIENCES

DEPARTMENT OF NATURAL AND APPLIED SCIENCES

QUALIFICATION: BACHELLOR OF SCIENCE	
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COURSE CODE: MAB702S	COURSE NAME: MARINE BIOLOGY 3B
SESSION: JANUARY 2019	PAPER: THEORY
DURATION: 3 HOURS	MARKS: 100

SUPPLEMENTARY / SECOND OPPORTUNITY EXAMINATION QUESTION PAPER	
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INSTRUCTIONS	
<ol style="list-style-type: none">1. Answer all questions in Sections A and B2. Answer any three (3) questions in Section C3. You may use a calculator4. Write clearly and neatly5. Number your answers correctly	

THIS EXAMINATION QUESTION PAPER CONSISTS OF 5 PAGES
(Including this front page)

SECTION A (MULTIPLE CHOICE QUESTIONS): ANSWER ALL QUESTIONS

[15]

1. All the following factors determines species distribution in rocky intertidal zones EXCEPT: (1)
 - a. Susceptibility to predation
 - b. Wave action
 - c. Boring mechanism
 - d. Light and temperature
 - e. Salinity

2. All the following statements about algae are correct EXCEPT: (1)
 - a. Examples include Lichens
 - b. Could be unicellular or multicellular
 - c. Several species have chlorophyll
 - d. Devoid of vascular tissues
 - e. Is a source of phycocolloids

3. The star fish belong to which group of the following animals? (1)
 - a. Mollusks
 - b. Foraminifera
 - c. Brachiopods
 - d. Ctenophores
 - e. Echinoderms

4. To which of the following kingdoms do the *Barnacles* belongs to? (1)
 - a. Fungi
 - b. Metazoa
 - c. Monera
 - d. Protista
 - e. Metaphyta

5. Oysters belongs to which kingdom? (1)
 - a. Foraminifera
 - b. Coccoliths
 - c. Metazoa
 - d. Brachiopods
 - e. Metaphyta

6. Sea urchins are classified under? (1)
 - a. Foraminifera
 - b. Mollusks
 - c. Brachiopods
 - d. Echinoderms
 - e. Ctenophores

7. Plankton that spend part of their lives in the pelagic zone and other part of their lives in the benthic zone are known as? (1)
 - a. Macroplankton
 - b. Meroplankton
 - c. Bacterioplankton
 - d. Holoplankton

- e. Microplankton
8. The free-swimming form of marine cnidarians is referred to as? (1)
- a. Medusa
 - b. Polyp
 - c. Nauplii
 - d. Cyst
 - e. Larva
9. The filamentous locomotory structures of the daphnia are referred to as? (1)
- a. Cilia
 - b. Antennae
 - c. Pleopods
 - d. Flagella
 - e. Pseudopodia
10. Marine organisms whose internal salt concentration varies with that of the surrounding seawater are collectively referred to as? (1)
- a. Osmoregulators
 - b. Osmoconformers
 - c. Euryhaline
 - d. Ion-concentrators
 - e. Urea-concentrators
11. Salt tolerant plants such as *Salicornia* spp. are ecologically referred to as? (1)
- a. Mangroves
 - b. Angiosperms
 - c. Gametophytes
 - d. Halophytes
 - e. Sporophytes
12. Sponges and other filter feeders use which of the following options as food source? (1)
- a. Particulate organic matters suspended in water
 - b. Decomposed organic matters
 - c. Dissolved organic nutrients
 - d. Dead benthic organisms
 - e. Nekton
13. Which behavioural phenomenon allows a pelagic fish to blend with the surroundings to avoid predator? (1)
- a. Warning colouration
 - b. Cryptic colouration
 - c. Defensive colouration
 - d. Morphometric colouration
 - e. Counter-shading colouration
14. Marine organisms that live within the sediment of the sea bottom are referred to as? (1)
- a. Aphotic
 - b. Epifauna
 - c. Infauna
 - d. Nekton

e. Pelagic

15. Which of the following options is not a source of food deep-sea organisms? (1)
- a. Dead phytoplankton
 - b. Dead zooplankton
 - c. Faecal droppings from pelagic fish
 - d. Dead intertidal zone benthos
 - e. Macrophyte detritus

SECTION B (SHORT EXPLANATION QUESTIONS): ANSWER ALL QUESTIONS [40]

16. a). Using the plus-minus-zero system, explain the nature of the ecological interaction in predation, parasitism, competition, territoriality, commensalism and mutualism exhibited by marine organisms. Use the table below for your answer. (4)

Type	Nature of interaction	Plus-minus-zero classification
Predation		
Parasitism		
Competition		
Territoriality		
Commensalism		
Mutualism		

- b). Explain the following terms as applied in Marine Biology. (6)
- i. LD₅₀
 - ii. Euryhaline
 - iii. Anadromous

17. a). Explain the term 'upwelling' and its effects on the productivity of the marine ecosystem. (6)

- b). Explain how eutrophication lead to reduction in biological productivity within the marine ecosystem. (4)

18. a). What does the following abbreviations refer to in fisheries management: (4)
- i. CPUE
 - ii. TAE
 - iii. TAC
 - iv. MPAs

b). Explain the two main goals of ecosystem-based fisheries management. (4)

c). Give the mathematical expression of the MSY model. (2)

19. a). With reference to survival strategies, discuss how estuarine animals have adapted to coping with salinity variations within the estuarine environment. (6)

b). Explain the phenomenon and causes of 'spring diatom increase'. (4)

SECTION C (DISCUSSION QUESTIONS) ANSWER ANY THREE QUESTIONS [45]

20. a). Discuss the unique characteristics of the various groups of benthos based on size, type and location, naming at least one marine benthic species for each group. (7)

b). With suitable examples, discuss the various environmental challenges faced by intertidal communities highlighting the survival strategies employed by the organisms in coping with these challenges. (8)

21. a). With graphical illustrations, discuss the causes and major differences in seasonal variation patterns in plankton abundance in the marine ecosystem in the Arctic, Temperate and Tropical regions. (10)

b). Discuss the main factors affecting feeding behaviours in marine copepods. (5)

22. a). With the aid of a graphical illustration, discuss how variation in the body volume of *Golfingia gouldii* over time when transferred from its original environment to a diluted water. (7)

b). With the aid of suitable illustrative diagram, discuss the 'counter-current heat exchange' mechanism in marine tunas. (8)

23. Discuss the major impacts of global warming on the ocean physicochemical parameters and explain how these impacts will affect the biology, habitat and behaviour of major fish stocks. (15)