



KENYATTA UNIVERSITY

UNIVERSITY EXAMINATIONS 2011/2012

SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE
AND BACHELOR OF EDUCATION

SBT 410: MARINE BOTANY

DATE: FRIDAY, 30TH MARCH 2012

TIME: 4.30 P.M. – 6.30 P.M.

INSTRUCTION: Answer ALL questions in Section A and ANY ONE question in Section B.
Answers in Section A should be written in the spaces provided on the question paper.

SECTION A: Short Answer Questions (5 Marks Each)

1. Explain each of the following observations in ONE sentence only (1 Mark each):
 - a) The majority of open sea organisms have a limited tolerance to salinity fluctuation
 - b) Heterocysts are usually non pigmented
 - c) During periods of bright sunshine, surface water photosynthesis is usually suppressed with maximum photosynthesis being realized at some depth below the water surface
 - d) Coral reef are often described as self-contained ecosystems
 - e) In Nova Scotia, over-fishing of lobsters led to a built up of sea urchin populations

2. Distinguish between the following terms (1 Mark each):
- a) Holoplankton and meroplankton
 - b) Sternohaline and euryhaline organisms
 - c) Zooplankton and zooxanthellae
 - d) Coccoliths and theca
 - e) Dispotic and aphotic zones
3. a) Describe the environmental changes that lead to the formation and the destruction of the temporary thermocline in mid latitude oceans (2 Marks):
- b) Comment on depth distribution of benthic marine Chlorophyta and Rhodophyta (2 Marks):
- i) Chlorophyta
 - ii) Rhodophyta
- c) State one strategy employed by delicate and mobile organisms of the high shore to avoid temperature extremes (1 Mark):

4. a) Comment on the effects of each of the following on coral growth (1 Mark each):

a) Introduction of freshwater

b) Water turbidity

c) Increased water circulation

b) State two assumptions made in the use of the transparent (light) and opaque (dark) bottle technique to determine the rate of marine phytoplankton photosynthesis (2 Marks):

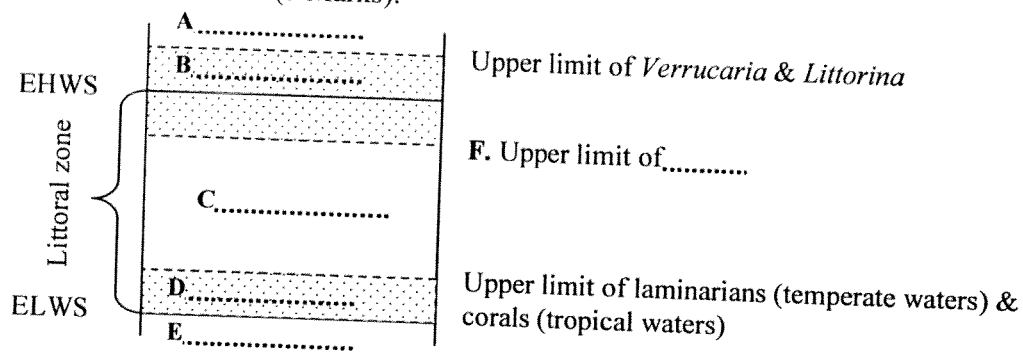
5. a) Compare the seasonal changes in nutrient levels in low, mid and high latitude oceans (3 Marks):

b) Explain why high nutrient loads lead to a reduction in coral diversity (1 Mark):

c) State one main value of dissolved organic matter in the marine environment (1 Mark):

6. a) Explain how each of the possession of each of the following affects sinking rate by the phytoplankton (1 Marks each)
- i) Small size
 - ii) Spines and horns
 - iii) Gas vacuoles
 - iv) Oil granules
- b) Describe the cause and effects of low energy waves (2 Marks)
7. Describe the ecological roles played by sea grass meadows in the sea (5 Marks)

- 8) a) The diagram below summarizes the zonation of organisms on the rocky shore. Identify the parts labeled A – F (3 Marks):



- b) Comment on the influence of species competition on moving from A to E (1 Mark):

- c) Account for the high diversity of the rocky shore (1 Mark):

SECTION B: Essay Questions (Maximum Marks 30)

Write an essay on **ANY ONE** of the following topics:

1. Seasonal variation in the marine phytoplankton photosynthesis and primary production
2. Mangrove swamp communities
3. Habitat types of the marine environment
