Marine Biology

Worksheet II

Invertebrates and Algae
Chapter 4: Taxonomy Section at End

1. What are some differences between Domain Bacteria and Domain Archaea?

2. Plant and animals are in Domain Eukarya. How do the cells of plants and animals differ from the cells of organisms in Domain Bacteria and Domain Archaea?

3. Define the term “Biological Species”. What are some of the problems with this species definition?

4. List the 7 taxonomic ranks form in order stating with Kingdom and ending with species.
   
   Kingdom  P_________  C_______  O________  F________  G_____  Species

Chapter 5: The Microbial World

5. Define the term detritus:

6. What role do decay bacteria play in marine ecosystems?

7. Can cyanobacteria be considered primary producers? Explain.
8. What are stromatolites?

9. Photosynthetic bacteria use light as an energy source. What do chemosynthetic bacteria
   use as an energy source?

10. What is meant by the term “nitrogen fixation”? Give an example of a group of organisms
    that are capable of fixing nitrogen.

11. Describe the difference between the terms plankton and nekton. (See glossary in text)
    **Plankton**  **Nekton**

12. Describe the difference between the terms phytoplankton and zooplankton. (See glossary
    in text)
    **Phytoplankton**  **Zooplankton**

13. Diatoms and Dinoflagellates belong to Kingdom ____________________. Describe at
    least two differences between diatoms and dinoflagellates.
    **Diatoms**  **Dinoflagellates**
14. Foraminiferans and Radiolarians are in Kingdom___________________. Describe at least two differences between foraminiferans and radiolarians.

**Foraminiferans**

**Radiolarians**

15. What does the term *bioluminescence* mean? Give an example of an organism that is bioluminescent.

16. What are red tides?

17. What are zooxanthellae and why are they important to coral reefs?

18. Define the following terms:

   A. Symbiosis________________________________________________________

   B. Mutualism_______________________________________________________

   C. Parasitism_______________________________________________________

**Chapter 6: Multicellular Primary Producers**

19. Give examples of two organisms in Phylum Chlorophyta. What color are organisms in this phylum? Why?

20. Give examples of two organisms that are in Phylum Heterokontophyta - Class Phaeophyta. What color are these organisms?

21. What type of algae are in Phylum Rhodophyta?

22. What group of algae do kelp belong to?
23. **Matching:** Test Your Knowledge: Information from the reading and lecture

(1) _____Brown algae
   (2) _____Glass skeleton
   (3) _____Red Tides
   (4) _____Silica shells or frustules
   (5) _____Cellulose cell wall, unicellular
   (6) _____Bioluminescent
   (7) _____Limestone skeleton
   (8) _____Green algae
   (9) _____Oil filled vacuoles - float
   (10) _____Two unequal flagella
   (11) _____Ciguatera fish poisoning
   (12) _____Red algae
   (13) _____Kelps
   (14) _____Red Algae
   (15) _____Green Algae

A. Chlorophyta
B. Diatoms
C. Dinoflagellates
D. Foraminiferans
E. Phaeophyta
F. Rhodophyta

24. What are structures 1-4 on the diagram of the kelp to the right?

(1)____________________
(2)____________________
(3)____________________
(4)____________________
Chapter 7: Marine Animals without a Backbone

25. Discuss the **functions** of each of the following cell types or structures in Porifera

A. Collar cells or choanocytes

B. Osculum

C. Ostium

D. Spongin

E. Spicules

F. Pinacocytes

26. Sponges belong to Kingdom ____________ Phylum ____________

27. Identify A through G on the diagram below:

A. ________________

B. ________________

C. ________________

D. ________________

E. ________________

F. ________________

G. ________________
28. List 4 characteristics of Phylum Cnidaria.
   A. 
   B. 
   C. 
   D. 

29. Discuss the relationship between cnidocytes and nematocysts.

30. Describe the difference between the terms Filter Feeder and Deposit Feeder.
    **Filter Feeder**
    **Deposit Feeder**

31. Give an example of an organism with:
    A. Radial Symmetry
    B. Bilateral Symmetry

32. Give two examples of Siphonophores. What class in Phylum Cnidaria do Siphonophores belong to?

33. Give an example of an organism in Class Scyphozoa. How do organisms in Class Scyphozoa differ from organisms in Class Anthozoa?

34. Name two types of organisms in Phylum Cnidaria Class Anthozoa.
35. What are the three classes in Phylum Cnidaria? How are these classes distinguished from each other?

Class__________ Class__________ Class__________

________________ _______________ _______________
________________ _______________ _______________
________________ _______________ _______________

36. What is the difference between A and B on the diagram below.

A. _____________________________

B. _____________________________

C. The cells represented by drawing A and B are called?

_______________________________

37. Matching:

(1) _____Aurelia - Class A. Anthozoa

(2) _____Physalia - Class B. Cnidaria

(3) _____Hydra - Phylum C. Ctenophora

(4) _____Comb Jelly - Phylum D. Hydrozoa

(5) _____Gonionemus - Class E. Scyphozoa

(6) _____Velum - Class

(7) _____Obelia - Class

(8) _____Corals - Class

(9) _____Sea anemone - Class

(10) _____Sea anemone (Metridium) - Phylum
38. The simplest animals that have bilateral symmetry belong to Phylum_______________.

39. Organisms the swim using 8 rows of ciliary combs belong to Phylum_______________.

40. The segmented worms belong to Phylum___________________.

41. Almost all marine annelids belong to Class___________________.

42. The group of marine worms that lacks a body cavity belongs to Phylum_______________.

43. Describe the difference between the terms Diploblastic and Triploblastic.

   Diploblastic                  Triploblastic

44. What is the only group of organisms within Phylum Mollusca that has a closed circulatory system? Why is a closed circulatory system as well as well developed sense organs necessary in this group?

45. List 5 characteristics of animals that belong to Phylum Arthropoda.

   A.
   B.
   C.
   D.
   E.
46. **Matching:** Information from the reading and lecture

(1) _____ Sponges  
(2) _____ Radial symmetry  
(3) _____ Triploblastic and acoelomate  
(4) _____ Parchment worm (*Chaetopterus*)  
(5) _____ Dinoflagellates that are found in corals  
(6) _____ Red tides  
(7) _____ Protozoans with calcium carbonate skeletons  
(8) _____ Predatory carnivorous polychaete  
(9) _____ Flatworms  
(10) _____ Sponges  
(11) _____ Jellyfish  
(12) _____ Carnivorous polychaete  
(13) _____ Kelp  
(14) _____ Portuguese Man-Of-War  
(15) _____ Arrow Worms  
(16) _____ Sandworm  
(17) _____ Cnidocyte  
(18) _____ Lugworm (* Arenicola *)  
(19) _____ Photosynthetic organisms in the tissues of sea anemones  
(20) _____ Phylum of eucelomate, segmented worms  
(21) _____ Comb Jellies  
(22) _____ This Phylum within Kingdom Animalia lacks tissues and organs
47. List two characteristic of the following groups of arthropods.

A. Crustaceans:

B. Copepods:

C. Barnacles:

D. Amphipods:

E. Isopods:

48. What group of organisms are characterized by pedicellaria and tube feet?

49. These are echinoderms that have slender arms that are easily broken.

50. These organisms feed on kelp and have a structure called Aristotle’s lantern.

51. These organisms have a respiratory tree that they may expel through their cloaca when disturbed.

52. These animals have a notochord as larvae, have incurrent and excurrent siphons, and are filter feeders.

53. These animals build mucus houses that serve as food collection devices

54. Limpets, sea slugs, and chitons belong to this phylum.

55. Most organisms in this phylum have a radula.

56. What are the 4 chordate characteristics?
Matching: Information from the reading and lecture

(1) _____ The lug worm (*Abarenicola*)  A.  Annelida
(2) _____ Brittle star  B.  Arthropoda
(3) _____ Arrow worms  C.  Chaetognatha
(4) _____ Giant keyhole limpet  D.  Echinodermata
(5) _____ Polychaete worms  E.  Mollusca
(6) _____ Flat worms  I.  Platyhelminthes
(7) _____ Tube worms
(8) _____ The parchment worm (*Chaetoperus*)
(9) _____ Nudibranchs
(10) _____ Octopus
(11) _____ Lobster
(12) _____ Sea Star
(13) _____ Clam
(14) _____ Cuttlefish
(15) _____ Sea urchin
(16) _____ Shrimp
(17) _____ Sea cucumber
(18) _____ Radula
(19) _____ Parapodia
(20) _____ Sea hare
(21) _____ Setae and segments
(22) _____ Cone snails