**Marine Science Midterm Review**

*Provide a short answer to the following questions.*

1. What two influences and what three marine resources make the oceans important to life on Earth? Explain why each is important.

2. Define marine science and oceanography. Include the four main branches of oceanography.

3. List the basic steps to the scientific method and describe each. Explain what a hypothesis and a thesis are. What is the difference between inductive and deductive reasoning? Include why the final

step in the scientific method is critical.

4. How much of the oceans have humans seen? What area do we know the most about?

5. Explain how human interaction can affect the ocean. How does this relate to the benefits of

understanding the marine environment?

6. What were the three primary reasons for early civilization to interact with the ocean? Do you think these reasons exist today? Why or why not?

7. Explain the contributions and significance of Phoenician and Polynesian and the later Viking seafaring.

8. Explain and diagram the latitude and longitude mapping system. Show the location of the 0º

parallel and the 0º meridian.

9. What were the Middle Ages? How did they affect the knowledge of geography and science?

10. What navigational tool helped sailors in the mid 1400s?

11. What noted naturalist sailed with the H.M.S. Beagle expedition? How did this naturalist explain the formation of coral reefs? What theory did this person propose as a result of his observations

during the expedition?

12. Describe big bang theory and how the solar system originated according to that theory.

13. Draw a diagram illustrating the pelagic zone and its subdivisions.

14. Draw a diagram illustrating the benthic zone and its subdivisions.

15. Describe the theory generally accepted by scientists for the origin of the universe, stars, and heavy elements. Include a description of a protostar and a star’s life cycle.

16. Describe the formation of Earth.

17. Describe the common theory that explains the origin of the atmosphere and oceans. Include how the formation of the oceans linked with the atmosphere to produce the theorized conditions under

which life arose.

18. Explain how water molecules bond to each other. What makes water a polar molecule?

19. When you dissolve salt in distilled water, what happens to the density? Is the water concentration now higher or lower? What properties will the water have that it did not have before? What are these properties called?

20. What is the principle of constant proportions?

21. Define heat capacity and explain how the heat capacity of water affects the Earth’s climate.

22. What properties make salt water different from freshwater.

23. Explain how sound behaves in water. How do some marine organisms take advantage of sound’s behavior in water?

24. Explain how salinity, temperature, and density relate.

25. Explain how water scatters and absorbs light.

26. Identify the factors that make the Earth heat unevenly and why they do so. Why is it summer in the Northern Hemisphere even though the Earth is farther from the sun than it is in winter?

27. Describe the process of convection and how it relates to airflow on Earth. How does the

relationship between water vapor, air temperature, and density relate to convection?

28. Explain what causes the Coriolis effect, and what influence it has on the wind.

29. Explain where the trade winds and the westerlies are found and explain what causes them. Include the role of atmospheric circulation cells and describe the airflow patterns that characterize the six

global cells.

30. Explain how cyclones form and where they get their energy. Include why they circulate

“backwards” with respect to the Coriolis effect and their role in heat distribution.

31. An imaginary grid system runs over the face of the Earth. This system is known as...

32. How much water covers the earth’s surface?

33. Who invented the compass in 1125?

34. To determine location in the ocean we use modern technology such as GPS, however in the time of James Cook a device that determined longitude in open water was called:

35. Hydrogen bonds are the result of attraction between:

36. The property of water whereby molecules tend to stick to objects is called:

37. Salinity is expressed in parts per

38. The average salinity of the ocean is \_\_parts per thousand.

39. The two main factors controlling the density of water are:

40. What is diffusion?

41. If you have two containers of seawater and you evaporate some of the water out of one. Which container of water will have the highest salinity? Do all the oceans have the same salinity?

42. What is the difference between cohesion, adhesion and surface tension?

43. Insects and floating plankton use which of the above three characteristics to stay on the surface of water.

44. There was no oxygen present in the early atmosphere. What types of organisms were present

during this early atmosphere?

45. During Earth formation, heavier material moved to the Earth’s Core. What material makes up the Earth’s core?

46. According to theory how did the Earth form?

47. Which has more heat - test tube of 80-degree water or a fish tank of 80-degree water?

48. Define heat capacity

49. What characteristic of water gives it a high heat capacity

50. What causes a sea breeze during the day and land breeze at night?

51. Advantages of being plankton that float are \_\_\_.

52. Where do Grey whales migrate to in the summer? Why?

53. Coriolis Efect is caused by

54. Cyclones form when

55. The primary forces that provide energy for surface currents include

56. What is a gyre?

57. What is theENSO?

What happens during the cold water phase?

What happens during the warm water phase?

58. Water vapor condensed to form which first ocean? How many exist today? Name them.