

**Part I. Multiple Choice (3 pts each)**

1. If fishing effort goes up and the landings are the same, then
  - a. Stock size must have declined
  - b. Stock size must have increased
  - c. Stock size may have remained the same
  - d. The premise of increased effort with similar landings is impossible
  - e. None of the above.
  
2. On a worldwide basis, food harvested from the ocean accounts for approximately \_\_\_\_\_ of the total protein that is consumed by humans.
  - a. 30%
  - b. 20%
  - c. 10%
  - d. 5%
  - e. 1%
  
3. Gadoid fish species are typically caught by commercial fishers using a
  - a. Purse seine
  - b. Bottom trawl
  - c. Baited hooks
  - d. Fish traps
  - e. None of the above
  
4. The high benthic organism biomass adjacent to hot vents depends upon the release of
  - a. Sulfur from the vents
  - b. Nitrogen from the vents
  - c. Phosphorus from the vents
  - d. Bacteria from the vents
  - e. All of the above
  
5. Deep sea benthic communities in non-hydrothermal areas of the world's oceans are dominated by:
  - a. Carnivorous invertebrates and fishes
  - b. Deposit-feeding invertebrates
  - c. Brightly colored organisms
  - d. Suspension-feeding invertebrates
  - e. All of the above

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6. Bivalves and vestimentiferan tube worms living near vents
  - a. Have very slow growth rates
  - b. Have growth rates similar to typical abyssal benthos
  - c. Grow only in response to falls of phytoplankton detritus
  - d. Have very rapid growth rates
  - e. None of the above
  
7. Vestimentiferan tube worms can live without a gut because
  - a. They live near sources of dissolved organic matter
  - b. They are parasites living within the guts of bivalves
  - c. They have symbiotic bacteria, which are the source of their nutrition
  - d. They are autotrophes
  - e. None of the above
  
8. Which of the following aquaculture activities is the most expensive to operate
  - a. Extensive aquaculture
  - b. Intensive aquaculture
  - c. Semi-intensive aquaculture
  - d. All of the above.
  - e. None of the above.
  
9. According to the stability-time hypothesis, organisms inhabiting unpredictable (physically-controlled) habitats should **not** exhibit the following trait:
  - a. Fast growth rates
  - b. Low speciation rates
  - c. Low genetic variability
  - d. High fecundity
  - e. None of the above
  
10. Biomagnification of a pollutant refers to:
  - a. the mechanism organisms use to detoxify the effects of a pollutant as it moves through the food chain
  - b. the process resulting in the increased concentration of pollutant as it moves up the food chain
  - c. a term describing how the effects of a pollutant can be amplified when it is consumed by humans
  - d. the process by which organisms accumulate a pollutant
  - e. None of the above

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11. As you decrease in water depth, generally benthic species diversity \_\_\_\_\_ and biomass \_\_\_\_\_.
  - a. decreases, decreases
  - b. increases, increases
  - c. decreases, increases
  - d. increases, decreases
  - e. None of the above.
  
12. The ocean's response to global climate change will be
  - a. decreased water column productivity
  - b. warmer surface waters
  - c. increased sea level rise
  - d. expansion of warm water species into temperate regions of the world
  - e. All of the above
  
13. Deep sea organisms are typically:
  - a. larger than their shallow water counterparts
  - b. brighter colored than their shallow water counterparts
  - c. slower growing than their shallow water counterparts
  - d. All of the above
  - e. None of the above
  
14. With the projected increases in aquaculture during the next several decades, it is only a matter of time before:
  - a. the world's population will rely on the oceans for the majority of its food intake
  - b. the world's population will rely on the oceans for the majority of its protein intake
  - c. the abundance of cultured organisms will outweigh the abundance of fished organisms caught annually
  - d. All of the above
  - e. None of the above
  
15. The majority of pollutants entering the oceans are:
  - a. Trace metals
  - b. Synthetic organic compounds
  - c. Oil and other hydrocarbons
  - d. Radioactive compounds from hospitals and nuclear power plants
  - e. Sediments and fertilizers from the land

**Part II. Short Answer (6 pts each)**

1. Describe the difference between non-point and point source pollutant input into the ocean.

2. What is the 'Fishers Dilemma'?

3. List three of the four major nutritional pathways for hydrothermal vent organisms.

4. What is 'bycatch' and why is there a problem with it?

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5. When talking about pollution, what does “assimilative capacity” mean?

**Part III. Long Answer (10 pts)**

1. How can we help reduce the negative environmental impacts associated with the culture of marine organisms?

2. If you were in the position to legislate and regulate the types and quantities of materials deposited into the oceans, describe how you would treat the following types of waste materials: (a) wastes from a small industry manufacturing batteries for automobiles, (b) waste products from a large pharmaceutical company, and (c) radioactive waste materials from a hospital located in central Connecticut.

**Happy Holidays and Best Wishes in the New Year!**