

Last Name _____ First name _____ SS

No. _____

Check to make sure that your name and SS# are coded correctly on your computer answer sheet

Answer questions 1-35 on the Scantron

True/False (A = true, B = false), 25 questions, one point each

1. Photosynthetic bacteria are the most abundant primary producers in the ocean.
2. The microbial loop contributes several trophic levels to oceanic foodwebs.
3. Rich fishery grounds correspond with areas of low primary production.
4. All primary production in the surface ocean is a result of photosynthesis.
5. Chemoautotrophic bacteria manufacture food from H₂S.
6. Autotrophs are secondary consumers.
7. The sea is about 20 times more productive than the land.
8. In general, terrestrial ecosystems have more trophic levels than marine ecosystems.
9. In the sea, at each trophic level, about 90% of the organic matter produced is passed up the food chain to the next trophic level.
10. The deep scattering layer undergoes vertical migration to the surface on a diurnal basis.
11. Aquaculture contributes a large percentage of total fisheries production in the world.
12. Tunas and billfish comprise the biggest catch of commercial fisheries in the world.
13. The average per capita fish catch in the world is still increasing.
14. Productive fishery areas have short food chains.
15. Purse seining uses hooks deployed over long distances in the ocean.
16. Whale falls represent the most species rich substratum of any bottom surface in the deep sea.
17. Dead whales represent one pathway of transfer of organic carbon from the euphotic zone to the deep sea.
18. The Darwin Point is a place where atolls drown due to insufficient coral growth.
19. Water vapor, carbon dioxide and methane are all greenhouse gases.
20. Evidence from ice cores suggests that CO₂ levels in the atmosphere at the beginning the industrial revolution were much higher than today.
21. Sewer outfall effluents pollute coral reefs in Hawaii.
22. The Walker Circulation is disrupted during an El-Nino Event.
23. Hurricanes get their energy from cold water.
24. Carbon dioxide is expected to double in the atmosphere by the year 2100.
25. The decline of reef fisheries in Hawaii is primarily due to pollution.

Multiple choice; 10 questions, pick the best answer; one point each

the next 100 years. a) -1.8 to +10 C, b) +1.5 to +4.0 C, c) 0 C to +100 C, d) +5 C to +10 C.

27. The human population on earth is: a) about 6.0 billion people, b) beyond carrying capacity, c) increasing exponentially, d) all of the above.

28. The world annual fish harvest from the ocean is: a) about 85 million tons, b) is no longer increasing, c) taken primarily in areas of high productivity, d) all of the above
29. Primary production is controlled by: a) upwelling, b) the concentration of nutrients, c) depth of the mixed layer, d) all of the above.
30. Terrestrial ecosystems have _____ food chains than marine ecosystems
a) longer and less efficient, b) shorter and more efficient, c) longer and more efficient, d) shorter and less efficient.
31. Upwelling usually: a) increases the temperature of surface waters, b) decreases productivity of surface waters, c) decreases the nutrients in surface waters, d) none of the above
32. Carbon dioxide warms the earth by: a) absorbing infrared radiation, b) increasing cloudiness, c) forming carbonate sediments, d) forming biomass in photosynthesis
33. Chemosynthetic communities at hydrothermal vent sites get their energy from:
a) the sun, b) chemicals in the heated water, c) manganese nodules, d) giant worms
34. The most important sources producing sea level rise caused by increased atmospheric CO₂ levels are: a) melting of mid latitude glaciers, b) melting of polar ice caps, c) warming of the surface ocean causing thermal expansion, d) all of the above
35. Which of the following is not an important factor in controlling primary production
a) nutrients, b) light, c) temperature, d) detritus

Fill in questions, 20 questions, fill in the blank spaces with the best answer, one point each:

36. The carbon pump transports _____ from the surface ocean to the deep sea.
37. Cod are most often caught in _____ nets.
38. The sea produces about _____% of the food produced on land.
39. Whale falls serves as _____ for the dispersal of many deep sea benthic organisms.
40. The increase in the concentration of a pollutant as it moves up the food chain is called _____.
41. In a food chain, the feeding levels are called _____ levels.
42. The efficiency of transfer of food energy up the food chain is about _____%.

43. The distribution pattern of abundance for most species is _____.
44. The role that an organism plays in its environment is called its _____.
45. A _____ species provides the basic structure of a habitat.
46. Mutualism is an example of symbiosis in which both species _____.
47. The orderly replacement of species or communities over time within ecosystems is called _____.
48. Coral reefs are the most _____ communities in the sea.
49. The point where atolls drown in the Hawaiian chain due to subsidence and plate motion is called the _____.
50. Fisheries in the Eastern Pacific collapse during periods of El Nino because upwelling is _____.
51. The loss of zooxanthellae in corals due to stress is called _____.
52. The compensation depth is usually found at the _____ % light level in the sea.
53. In general, the solution to pollution is _____.
- 54 & 55. The impact of a pollutant on marine resources and/or human health depends on its _____ and _____.

Essay questions, five points each

1. Illustrate a biomass trophic pyramid with a sketch and identify 5 trophic levels. Explain ecological efficiency and distinguish it from biomagnification.
2. Write the formula for photosynthesis and list 3 things it requires.

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3. With the use of a diagram, describe conditions (light, nutrients, & sunlight) that would lead to a phytoplankton bloom in a high-latitude surface ocean environment (use the northern hemisphere).

4. With the use of a diagram, explain the theory of fisheries management showing the effect of recruitment, growth, natural and fishing mortality on a given stock of fish. In the case of fishing, explain what compensatory factors are important.

5. Define El-Nino and briefly describe how it changes the weather and oceanography of the equatorial Pacific including Hawaii.