

OCN 201 Spring 2003 Exam 2
Section 2

True/False

Indicate whether the sentence or statement is true or false.

- ___ 1. During an El Nino event, seawater in the Eastern Pacific gets colder.
- ___ 2. Aerosol particles in air pollution can have a cooling effect on climate.
- ___ 3. Calcium is an essential nutrient in seawater used by all organisms
- ___ 4. In the ocean, sound travels farthest in the regions where its velocity is greatest.
- ___ 5. Gyres in the Northern hemisphere move counter-clockwise
- ___ 6. The velocity of a deep water wave can be calculated from its period
- ___ 7. The density of seawater is determined by temperature and salinity
- ___ 8. Rising air gets warmer.
- ___ 9. Upwelling usually brings nutrient-poor water to the surface.
- ___ 10. Deep-ocean nitrate comes from remineralization
- ___ 11. Short residence time elements are uniformly distributed in the oceans
- ___ 12. The Hadley cell is an atmospheric circulation cell that moves air from the Equator to 30°N
- ___ 13. Spring tides occur when the Sun and the Moon are in line with each other
- ___ 14. There is more phosphate in the deep water of the Pacific Ocean than in the deep water of the Atlantic Ocean

Multiple Choice

Identify the letter of the choice that best completes the statement or answers the question.

- ___ 15. The ocean is blue because
 - a. Blue light is absorbed more readily than other colors
 - b. Reefs and other benthic structures are blue
 - c. Red light is absorbed more readily than other colors
 - d. None of the above
- ___ 16. The SOFAR layer in the ocean is a region
 - a. with maximum sound speed
 - b. with minimum sound speed
 - c. where submarines can hide from SONAR
 - d. where sound waves refract away from
- ___ 17. Nutrients are removed from the surface waters of the ocean down to the point where the light level is
 - a. 50%
 - b. 10%

- c. 5%
 - d. 1%
- ___ 18. The energy to move the winds comes from
- a. the sun
 - b. the ocean
 - c. the rotation of the Earth
 - d. the tides
- ___ 19. The freezing point of seawater of salinity 35 is approximately:
- a. 0°C
 - b. -2.9°C
 - c. -1.9°C
 - d. 4°C
- ___ 20. During an El Nino event, Southeast Asia and Indonesia get
- a. rainier
 - b. drier
 - c. higher sea level
 - d. more intense hail storms
- ___ 21. Typical tidal range in Hawaii is around
- a. 2ft
 - b. 6ft
 - c. 10ft
 - d. 20ft
- ___ 22. Effective transport in the Ekman layer in the northern hemisphere relative to the wind is
- a. 20° to the left
 - b. 90° to the left
 - c. 15° to the right
 - d. 45° to the right
 - e. directly ahead
- ___ 23. If a wind wave has a period of 8 seconds its velocity in meters per second in deep water would be approximately:
- a. 8
 - b. 12
 - c. 24
 - d. 210
- ___ 24. The period of a typical Tsunami is:
- a. 30 seconds
 - b. 2 minutes
 - c. 15 minutes
 - d. 35 minutes
- ___ 25. Major ions in sea water have residence times:
- a. greater than 1 million years
 - b. greater than 1,000 years
 - c. less than 1million years
 - d. more than 100 million years
- ___ 26. The thermohaline conveyor belt makes one circuit in about
- a. 100 years
 - b. 1000 years
 - c. 1 million years
 - d. 10.5 months
- ___ 27. The pycnocline is the depth in the ocean where
- a. the temperature changes rapidly

- b. the salinity changes rapidly
 - c. the density changes rapidly
 - d. sharks hang out waiting for surfers
- ___ 28. How much salt is dissolved in a kilogram of typical seawater
- a. 1 gram
 - b. 15 grams
 - c. 35 grams
 - d. 0.1 gram
- ___ 29. In the Northern Hemisphere, the coriolis effect causes winds to
- a. rise
 - b. fall
 - c. bend left
 - d. bend right
- ___ 30. The 1% light level in the open ocean (say just north of Hawaii) is somewhere around
- a. 1 m
 - b. 40 m
 - c. 120 m
 - d. 200 m
- ___ 31. The IPCC has confirmed that
- a. the Earth is warming everywhere
 - b. most of the Earth is warming
 - c. only a few places are warming
 - d. the temperature record is so variable that we cannot conclusively say if the Earth is warming
- ___ 32. As you move down deep into the ocean, the sodium concentration
- a. increases
 - b. decreases
 - c. stays the same
 - d. none of the above
- ___ 33. Western boundary currents are:
- a. slower than eastern boundary currents
 - b. colder than eastern boundary currents
 - c. both of the above
 - d. none of the above
- ___ 34. When waves refract, they:
- a. bend
 - b. bounce in all directions
 - c. convert to heat
 - d. uniformly bounce in one direction

Completion

Complete each sentence or statement.

35. The Earth loses its heat by _____
36. The doldrums are located in the _____ zone.
37. Major ions are well mixed in the ocean because they have a _____ residence time.

Short Answer

38. The source of iron in the central Pacific is _____

39. Explain why tsunamis in the deep ocean are considered to be shallow-water waves.

Essay

40. Can you see in the ocean below 1000 m? Why or why not?