

OCN 201 Fall 2008 2nd exam Section 1

True/False

Indicate whether the statement is true or false.

- ___ 1. Because of the dissolved salt in seawater its freezing point is higher than that of pure water
- ___ 2. Marcet's principle states that "regardless of how the salinity may vary from place to place the ratios between the amounts of the major ions in the waters of the open ocean are nearly constant"
- ___ 3. The hydrothermal vent sites at Loihi have lots of animals around them.
- ___ 4. Iron is a chemical that is taken up by many organisms in the ocean because they need it for some biochemical processes
- ___ 5. The concentration of Nitrate (NO₃) in the deep water of the Pacific Ocean is less than that in the deep water of the Atlantic Ocean
- ___ 6. Deep water forms in the Pacific Ocean and flows to the Atlantic
- ___ 7. Thermohaline circulation is the process whereby surface seawater becomes denser at high latitudes and sinks to form new deep water
- ___ 8. Outgoing radiation from the Earth is longwave
- ___ 9. Humid air is more dense than dry air
- ___ 10. Low pressure zones in the atmosphere occur where air is ascending
- ___ 11. The atmospheric pressure at the top of Mauna Kea is approximately 562 mb
- ___ 12. During El Nino conditions atmospheric pressure is lower in Tahiti than in Darwin
- ___ 13. During El Nino conditions hurricanes are more likely to come near Hawaii
- ___ 14. The velocity of a deep water wave can be calculated from its period
- ___ 15. A wave behaves as a deep water wave if it is in water deeper than 1/2 its wavelength
- ___ 16. When the crest of a wave overlaps with the trough of another wave this is called constructive interference
- ___ 17. The effect of the Sun on the generation of tides is about 45% of that of the Moon
- ___ 18. Spring tides occur when the Sun and the Moon are in line with each other
- ___ 19. Tides are created only as a result of gravitational attraction
- ___ 20. Methane is also a greenhouse gas

Multiple Choice

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

- _____ 21. How much salt is dissolved in a kilogram of typical seawater
- 1gram
 - 15 grams
 - 35 grams
 - 0.1 gram
- _____ 22. In sea water major ions constitute what percentage of the total?:
- 100%
 - 99.8%
 - 90%
 - 50%
 - 10%
- _____ 23. Major ions in sea water have residence times:
- greater than 1 million years
 - greater than 1,000 years
 - less than 1million years
 - more than 100 million years
- _____ 24. How long would it take to replace all the water in the oceans with river water?
- 36,000 years
 - 8 million years
 - 1000 years
 - 1 million years
 - 100 million years
- _____ 25. Conservative ions are:
- those whose proportions remain constant relative to each other in all oceans
 - those whose proportions vary relative to each other in all oceans.
 - those ions whose concentration is less than 1 mmol
 - those ions whose concentration is greater than 1 mmol
 - those ions that vote republican
- _____ 26. Most of the chemicals in seawater come from
- hydrothermal vents
 - rivers
 - rain
 - phytoplankton
- _____ 27. The chemosynthetic based communities at hydrothermal vent sites get their energy ultimately from:
- Sulphide
 - Sunlight
 - Warmth of the water
 - Radioactive decay
 - Twinkie bars

- _____ 28. Hydrothermal chimneys form from:
- Precipitation of materials from the hydrothermal fluid
 - From molten lava as new ocean floor is created
 - The remains of dead animals that live near the vents
 - Left over plate lunch
- _____ 29. Most of the NO_3 in the ocean comes from
- the atmosphere
 - rivers
 - rain
 - hydrothermal fluids
 - ships
- _____ 30. What determines the depth to which nitrate and phosphate are completely removed from the surface waters of the ocean?
- light penetration
 - upwelling
 - pressure
 - temperature
- _____ 31. Most of the tritium entered the surface ocean
- during the second world war
 - in 1952
 - in 1964
 - in 1981
- _____ 32. The thermocline is the part of the ocean where
- the density changes rapidly
 - salinity changes rapidly
 - the temperature changes rapidly
 - you are most likely to find Elvis
- _____ 33. In water the speed of sound
- increases with decreasing temperature
 - increases with increasing pressure
 - all of the above
 - none of the above
- _____ 34. The colour of light that is absorbed least in the ocean is
- violet
 - blue
 - green
 - red
- _____ 35. The speed of light in water, compared to air is:
- greater
 - less
 - same
- _____ 36. Approximately what % of incoming light reaches 10 m depth
- 1%
 - 6%
 - 16%
 - 46%

- _____ 37. At the equator the Earth is rotating eastward at approximately:
- 100 mph
 - 10,000 mph
 - 1,000 mph
 - 1,500 mph
- _____ 38. The southern oscillation is:
- the change in direction of Coriolis force at the equator
 - the change in pressure differential between Darwin and Tahiti
 - the change in the thermocline depth between El Nino and La Nina
 - A popular dance from Brazil
- _____ 39. During El Nino conditions the surface waters of the eastern Pacific are:
- colder than normal
 - warmer than normal
 - more productive than normal
 - drier than normal
- _____ 40. The period of a wave is:
- the distance between its crests
 - the time it takes succeeding crests to pass a fixed point
 - the number of waves that pass a fixed point each second
 - the distance from the crest to the trough of a wave
- _____ 41. Typical tidal range in Hawaii is
- 12-15ft
 - 3-6 ft
 - 10-12ft
 - 20-25ft
- _____ 42. When wave trains propagate away from a storm they lose what percentage of their height each day?
- 10%
 - 50%
 - 30%
 - 22%
- _____ 43. During the movie clip we watched in class about the Hokulea, what was the purpose of observing the directions of the waves in the surface ocean
- Predict the arrival of a nearby storm
 - Maintain the direction of the canoe's travel
 - Identify the presence of nearby islands
 - All of the above
- _____ 44. When a deep water wave approaches the shore which of the following is true:
- its velocity remains constant
 - its period remains constant
 - its wavelength remains constant
 - all of the above
- _____ 45. In the movie clip we saw in class, where were the very large waves?
- Cape Horn
 - Cape of Good Hope
 - Cabo san Lucas
 - South of Iceland

- _____ 46. In the Pacific Ocean, Tsunami travel at approximately:
- 13 mph
 - 45 mph
 - 150 mph
 - 450 mph
- _____ 47. The period of a typical Tsunami is:
- 30 seconds
 - 2 minutes
 - 15 minutes
 - 35 minutes
- _____ 48. As a result of tides the length of a day on Earth is:
- increasing
 - decreasing
 - not changing
- _____ 49. Each day high tide is approximately:
- 1 hour later
 - 1 hour earlier
 - 2 hours later
 - exactly the same time
- _____ 50. There are two Spring tides every
- day
 - 7 days
 - 14 days
 - 28 days
- _____ 51. Recent atmospheric CO₂ levels started to increase around
- 1700
 - 1780
 - 1850
 - 1935
- _____ 52. Relative to the atmosphere how much carbon dioxide is dissolved in the oceans:
- the same amount
 - one tenth
 - 70 times as much
 - 1000 times as much
- _____ 53. How much of the Earth's surface water is in the oceans?
- 10%
 - 97%
 - 99%
 - 73%
- _____ 54. Hydrothermal fluids result from the reaction of sea water with high temperature magma below the bottom of the sea-floor. How deep can these fluids go:
- 10 m
 - 1 km
 - 5 km
 - 100km

- _____ 55. If you cool seawater its density
- increases
 - decreases
 - stays the same
- _____ 56. The SOFAR layer in the ocean is a region
- with maximum sound speed
 - with minimum sound speed
 - where submarines can hide from SONAR
 - where sound waves refract away from
- _____ 57. The mass of one square inch of the atmosphere at the Earth's surface is approximately
- 5 pounds
 - 1 pound
 - 15 pounds
 - 25 pounds
 - 10 pounds
- _____ 58. Currents flow around the boundary of the gyres because of
- geostrophic balance
 - Coriolis force
 - trade winds
 - Ekman spiral
- _____ 59. In the movie we saw in class, during the 1982/3 El Nino which area was affected by many typhoons?
- | | |
|---------------------|----------|
| a. Australia | c. India |
| b. French Polynesia | d. Japan |
- _____ 60. If a wind wave has a period of 12 seconds its velocity in meters per second in deep water would be approximately:
- 8
 - 12
 - 18
 - 36

Completion

Complete each statement.

61. The mixing time of the oceans is approximately _____ years
62. The three factors that determine the development of a "full sea" are _____,
_____ and _____

