

Name:

Class:

Date:

ID: A

OCN 201 Final 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. Salinity is used to determine the density of sea water
3. Hydrothermal vents can be found by high concentrations of manganese in the water.
4. There are no hydrothermal vents in the Arctic Ocean
5. Iron is a chemical that is taken up by many organisms in the ocean because they need it for some biochemical processes
6. 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
7. Tritium (3H) was produced during the atmospheric testing of nuclear weapons
8. There are only two places in the ocean where deep water is currently made
9. In the mid-latitudes 30-40° there is more evaporation from the surface of the ocean than precipitation back into it
10. Outgoing radiation from the Earth is longwave
11. Dry air is more dense than humid air
12. Low pressure zones in the atmosphere occur where air is ascending
13. Surface currents are driven by thermohaline processes
14. Gyres in the Northern hemisphere are anticlockwise
15. During El Nino conditions hurricanes are less likely to come near Hawaii
16. Long wavelength waves travel more slowly than short ones
17. The wavelength of a wave is the distance from the crest to the trough
18. When a wave approaches the shore it bends towards it
19. The effect of the Sun on the generation of tides is about 45% of that of the Moon
20. High tides is approximately 1 hour earlier every day
21. Geological evidence suggests that 100 million years ago carbon dioxide levels were much higher than that of today's atmosphere
22. Our current state of knowledge allows us to accurately predict the rise in sea level as atmospheric CO₂ levels increase
23. The most significant contributor to future global sea level rise is thermal expansion of surface ocean water
24. Most of the volume of the ocean is composed of pycnocline waters
25. Carbon dioxide is one of several greenhouse gases

Multiple Choice

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

26. How much salt is dissolved in a kilogram of typical seawater
 - a. 1 gram
 - b. 15 grams
 - c. 35 grams
 - d. 0.1 gram
27. In sea water major ions constitute what percentage of the total?:
 - a. 100%
 - b. 99.8%
 - c. 90%
 - d. 50%
 - e. 10%
28. Most of the chemicals in seawater come from
 - a. hydrothermal vents
 - b. rivers
 - c. rain
 - d. phytoplankton
29. Hydrothermal fluids do not boil at 380 °C at the bottom of the ocean because
 - a. Pressure has raised the boiling point
 - b. Sea water doesn't boil
 - c. There are too many chemicals dissolved in the sea water
 - d. The particles prevent boiling
30. The chemosynthetic based communities at hydrothermal vent sites get their energy ultimately from:
 - a. Sulphide
 - b. Sunlight
 - c. Warmth of the water
 - d. Radioactive decay
 - e. Twinkie bars
31. The "Chimneys" at hydrothermal vent sites are formed from:
 - a. magnesium
 - b. lava
 - c. iron, zinc and copper sulphides
 - d. the remains of organisms.
32. Which of the following chemicals is most likely to be the limiting nutrient in the surface waters of the ocean?
 - a. calcium
 - b. silicon
 - c. phosphorous
 - d. carbon
 - e. cadmium

33. The 1% light level in the open ocean (say just north of Hawaii) is somewhere around
- 1 m
 - 60 m
 - 120 m
 - 200 m
34. If you cool seawater its density
- increases
 - decreases
 - stays the same
35. The pycnocline is the depth in the ocean where
- the temperature changes rapidly
 - the salinity changes rapidly
 - the density changes rapidly
 - sharks hang out waiting for surfers
36. 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
37. The maximum energy of light coming into the surface ocean is in the following part of the spectrum
- violet-indigo
 - blue-green
 - yellow-orange
 - red-infrared
38. The speed of light in water, compared to air is:
- greater
 - less
 - same
39. The atmospheric pressure at the top of Mauna Kea is approximately
- 1000 mb
 - 829 mb
 - 562 mb
 - 213 mb
40. Effective transport in the Ekman layer in the northern hemisphere relative to the wind is
- 20° to the left
 - 90° to the left
 - 15° to the right
 - 45° to the right
 - directly ahead
41. Eastern boundary currents are:
- slower than western boundary currents
 - colder than western boundary currents
 - all of the above
 - none of the above

42. Southern oscillation is:
- a variation in the upwelling along the equator
 - a subsurface wave that travels along the thermocline
 - a variation in the pressure gradient between Tahiti and Darwin
 - a new dance
43. During the 1982/83 El Nino the weather conditions in Australia were:
- drought
 - heavy rainfall
 - hurricanes
 - unaffected
44. In the movie we saw in class, during the 1982/3 El Nino which area was affected by many typhoons?
- Australia
 - French Polynesia
 - India
 - Japan
45. A wave behaves as a shallow water wave when the depth of the ocean is equal to or less than:
- one wavelength
 - 1/2 wavelength
 - 1/20 wavelength
 - 1/23 wavelength
46. Typical tidal range in Hawaii is
- 12-15ft
 - 3-6 ft
 - 10-12ft
 - 20-25ft
47. If a wind wave has a period of 8 seconds its velocity in meters per second in deep water would be approximately:
- 8
 - 12
 - 24
 - 210
48. When wave trains propagate away from a storm they lose what percentage of their height each day?
- 10%
 - 50%
 - 30%
 - 22%
49. 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
50. 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
51. The period of a typical Tsunami is:
- 30 seconds
 - 2 minutes
 - 15 minutes
 - 35 minutes

52. Spring tides occur when:
- a. the moon is one quarter
 - b. the Sun and Moon are aligned with the Earth
 - c. Jupiter is aligned with Mars
 - d. none of the above
53. The current CO₂ content of the atmosphere (in ppmv) is about:
- a. 120
 - b. 180
 - c. 380
 - d. 560
54. If we were to burn all the fossil fuels and all the organic carbon in sediments we could, in principle, increase atmospheric CO₂ levels by:
- a. 2-times
 - b. 6- times
 - c. 13- times
 - d. 20- times
 - e. 50- times
55. Data from ice-cores shows that when carbon dioxide levels in the atmosphere went down, average planetary temperatures:
- a. stayed the same
 - b. went up
 - c. went down

Completion

Complete each statement.

56. The mixing time of the oceans is approximately _____ years
57. The energy released when atmospheric water vapour turns into rain is called _____ heat

Essay

58. Name 5 of the 6 major ions in seawater.

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59. Draw a picture that shows what happens to 100 units of primary production in the ocean. Label the amounts of material at each depth in the ocean and sediments

60. Name the four factors that drive surface currents in the ocean