

ES 106 Practice Lab Quiz  
Answers **highlighted in green**  
Try it first, then check your answers.

**These questions are from lab 1**

1. What is the equivalent of  $22^{\circ}\text{F}$ ?
  - a) 295 K
  - b)  $74^{\circ}\text{C}$
  - c)  $98.6^{\circ}\text{C}$
  - d)  **$-5.5^{\circ}\text{C}$**
  - e)  $33.2^{\circ}\text{C}$
2. Surface tension results in
  - a) Plastic sinking in water
  - b) Wood floating in water
  - c) Ice floating in water
  - d) **Pin floating on water**
  - e) Dye dispersing through water
3. The percent error in the calculation is
  - a) 0.1%
  - b) 0.2%
  - c) 0.3%
  - d) **0.5%**
  - e) 0.005%

**This question relates to #35**
4. In determining your unknown, which solution had a pH that was highly alkaline?
  - a) Known water
  - b) **Solution 1**
  - c) Solution 2
  - d) Solution 3
  - e) Solution 4

**These questions are from lab 2**

5. Which is the best conductor of heat?
  - a) Water
  - b) **Metal**
  - c) Wood
  - d) Plastic
  - e) Cloth
6. Absolute zero is
  - a)  **$-273^{\circ}\text{C}$**
  - b) 273 K
  - c) The freezing point of water
  - d)  $0^{\circ}\text{F}$
  - e)  $0^{\circ}\text{C}$
7. Convection causes
  - a) Heat to pool at bottom of room
  - b) Spoons to be too hot to handle
  - c) Campfires to give off warmth
  - d) Sun to warm Earth's surface
  - e) **Boiling water to self-stir**
8. Conduction causes
  - a) Heat to pool at bottom of room
  - b) **Spoons to be too hot to handle**
  - c) Campfires to give off warmth
  - d) Sun to warm Earth's surface
  - e) Boiling water to self-stir

### These questions are from lab 3

9. If water has a salinity of 30‰, 2 kg of water has how much dissolved salt?
- 15 grams
  - 15 kilograms
  - 6 grams
  - 60 grams
  - 60 kilograms
10. About what percent of Earth's surface covered by ocean?
- 25%
  - 40%
  - 55%
  - 71%
  - 90%
11. The Arabian Sea is located at
- 60°N latitude, 20°E longitude
  - 20°S latitude, 60°E longitude
  - 20°N latitude, 60°E longitude
  - 20°N latitude, 60°W longitude
  - 60°S latitude, 20°W longitude
12. At what latitude is the density of water at the ocean surface the least?
- 40°N
  - 20°N
  - 0°
  - 20°S
  - 40°S
13. High salinity causes surface ocean water to
- Sink to the bottom
  - Float at the top
  - Travel to equatorial areas
  - Travel to polar areas
  - Evaporate more quickly
14. What percent of Earth's surface is ocean at 85°S latitude?
- 100%
  - 70%
  - 50%
  - 30%
  - 0%

### These questions are from lab 4

15. Calculate how many kilometers that 5 cm represents on a map with a scale of 1:5,000,000
- 25,000 km
  - 25,000,000 km
  - 250 km
  - 25 km
  - 2500 km
16. Approximately how high above the surrounding sea floor is the mid-Atlantic ridge?
- About 2000 m
  - About 200 miles
  - About 5 m
  - About 80 million years
  - About 10 kilometers
17. If sea floor that is 200 km from the oceanic ridge is 20 million years old, the rate of plate movement is
- 10 cm/yr
  - 1 cm/yr
  - 100,000 cm/yr
  - 40,000 km/million years
  - 4000 cm/yr
18. Deep ocean trenches occur at
- divergent lithosphere plates
  - convergent lithosphere plates
  - ocean ridges
  - pillow lava
  - sea floor spreading
19. The 'Gauss Normal' magnetic polarity epoch began
- 3.3 years ago
  - 330,000 years ago
  - 700,000 years ago
  - 3.3 million years ago
  - 7 million years ago

**These questions are from lab 5**

20. Date of longest daylight in Oregon
- The fourth of July
  - September 22
  - December 20
  - March 22
  - June 21
21. This day is called
- Spring solstice
  - Fall equinox
  - Winter solstice
  - Summer equinox
  - Summer solstice
22. Compared to dry sand, water
- Heats faster
  - Emits more light
  - Absorbs more heat
  - Changes temperature more slowly
  - Has lower albedo
23. Sun angle is about how many degrees on June 20 at 23.5°N latitude
- 90° (straight overhead)
  - 23.5° S (toward equator)
  - 66.5° S (toward equator)
  - 23.5° N (toward pole)
  - 66.5° N (toward pole)
24. high albedo results in
- better absorption of heat
  - better reflection of heat
  - better conduction of heat
  - better convection of heat
  - ice floating on water

**These questions are from lab 6**

25. If one kilogram of air can hold 20 grams of water, and it contains 4 grams of water, it's relative humidity is
- 4%
  - 20%
  - 25%
  - 77%
  - 80%
26. As temperature increases, relative humidity
- Increases if no water vapor is added to the air
  - Decreases if no water vapor is added to the air
  - Is unchanged
  - Decreases due to pressure drop
  - Increases due to pressure rise
27. When air is cooled to its dew point temperature
- It expands on rising
  - It compresses on rising
  - It has a relative humidity of 100%
  - It has a relative humidity of 50%
  - It has a relative humidity of 25%
28. Using a sling psychrometer, the dry bulb temp. is 26° C. The wet bulb temp. is 17° C.  
The dew point temperature is
- 11° C
  - 11%
  - 18° C
  - 18%
  - 10° C
29. If 25° C air with a relative humidity of 50% rises from sea level and cools adiabatically, it will reach its dew point temp. at what altitude?
- 500 m
  - 1000 m
  - 1500 m
  - 2000 m
  - 5000 m

**These questions are from lab 7**

30. East of the Cascade Range
- a) There is a rain forest
  - b) **There is a rain-shadow desert**
  - c) It is maritime climate
  - d) The rainfall is greater at lower elevations
  - e) There are no rivers
31. The greatest precipitation occurs
- a) In the Willamette Valley
  - b) In the Great Basin
  - c) In the Steens Mountains
  - d) On the Columbia Plateau
  - e) **At the crest of the Coast and Cascade ranges**
32. The warmest July temperatures occur
- a) West of the Coast Range
  - b) In the Willamette Valley
  - c) At the crest of the Cascade Range
  - d) **At low elevations east of the Cascade Range**
  - e) At high elevations east of the Cascade Range
33. What correlation between elevation and precipitation is there in South-Central Oregon?
- a) **Higher elevation, higher rainfall**
  - b) Higher elevation, lower rainfall
  - c) Lower elevation, higher rainfall
  - d) No correlation
  - e) It doesn't rain in south-central Oregon
34. Winter in St. Paul, Minnesota is
- a) Drier than summer there
  - b) Hotter than summer there
  - c) Cold and wet, due to presence of ocean nearby
  - d) **Cold and dry, due to lack of ocean nearby**
  - e) Subject to tornadoes, because it is in 'tornado alley'

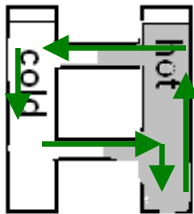
The last page is one you need to fill out. Don't use a scantron for the answers.

35. (Lab 1) A metal cylinder has a volume of 70 mL, and a mass of 190 grams. Calculate the density. Show calculations with units. What metal is it likely to be made of?

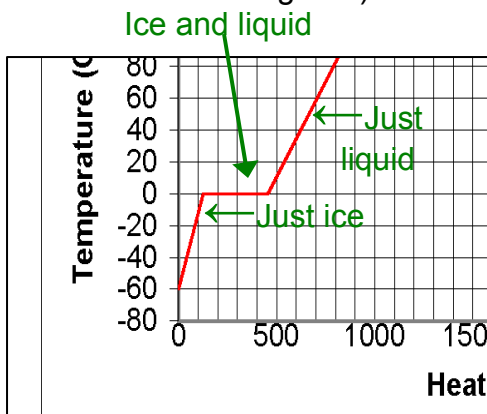
$$\frac{190g}{70mL} = 2.714 \frac{g}{cm^3} \text{ aluminum}$$

$$\frac{|2.714g - 2.7g|}{2.7g} \times 100 = 0.529\%$$

36. (Lab 2) On the diagram below, draw the arrows showing the circulation of the water by convection



37. (Lab 2) On the diagram below, label the line segments where there is solid water (ice), liquid and solid, liquid water only, liquid and vapor (steam), or only vapor, as is appropriate. (Not all will be in this diagram.)



38. (Lab 4) If rocks that are 500 km from the oceanic ridge are 25 million years old, what is the rate of sea floor spreading? Show calculations with units.

$$500km \times \frac{1000m}{1km} \times \frac{100cm}{1m} = 50,000,000cm$$

$$\frac{50,000,000cm}{25,000,000yr} = 2 \frac{cm}{yr}$$

(Show calculations for these problems)

39. (Lab 6) Given air at 20°C that contains 7 g/kg of water, calculate the relative humidity of the air.

$$\frac{7g / kg}{14g / kg \text{ capacity}} \times 100 = 50\%RH$$

40. (Lab 6) If this 20°C air rises 1000 m, what will its temperature become?

$$1000m \times \frac{10^\circ C}{1000m} = 10^\circ C \text{ temp.change}$$

Temperature decreases as air rises  
20°C - 10°C = 10°C

41. (Lab 6) What will be its relative humidity when it has risen the 1000 m?

10°C air can hold 7 g/kg, and it has 7 g/kg, so the relative humidity is 100%

$$\frac{7g / kg}{7g / kg \text{ capacity}} \times 100 = 100\%RH$$

42. (Lab 7) Draw the rainfall patterns given this data. Use every 5 inches of rainfall as divisions. What could cause a pattern like this mountains

