2014 Pizza Bowl Meteorology Exam

Name _____

Favorite Pizza Toppings Top 3 _____ _____ _____

Please don't put these on my pizza toppings _____ _____

1. Surface and near-surface ocean currents are powered primarily by wind.
    - **a. True**
    - b. False
        - ***i. Deep water currents are driven more by Thermohaline. Think about how the strong trade winds drive a La Nina.***
2. The two major controlling factors for deep ocean currents are:
    - a. Salinity and wind
    - b. Pressure and salinity
    - c. Wind and temperature
    - **d. Temperature and salinity**
        - ***i. Thermohaline drives the deep ocean currents***
3. _____ is a process in the water cycle where water vapor rises into the atmosphere
    - a. Precipitation
    - b. Transpiration
    - c. Condensation
    - d. Evaporation
4. Weather is determined by the conditions in the:
    - **a. Troposphere**
        - ***i. Where all the weather happens!***
    - b. Stratosphere
    - c. Mesosphere
    - d. Thermosphere
5. What force is behind all the weather on Earth?
    - a. Wind
    - b. Coriolis Force
    - c. Obliquity
    - **d. Energy from the sun**
6. A mountain can effect climate by:
    - a. Absorbing more solar energy at the peak than at the base of the mountain
    - **b. Causing precipitation to fall mostly on one side of the mountain**
        - ***i. Refer to Orographic lifting***
    - c. Pushing a cool air mass back out over the ocean
    - d. Interfering with air currents and affecting Earth's rotation
7. Which on the following is an example of a climate region:
    - **a. Tropical**
    - b. Sunny
    - c. Alpine
    - d. Rainy
8. What type of front forms when an active cold front overtakes a warm front, producing a complex weather pattern?

a. Stationary front
b. Warm front
c. Dry-line/ Dew Point front
d. Occluded front
    i. **As the faster moving cold front OVERTAKES (key word here vs. stalling next to which would have made this a stationary front) it becomes occluded (often from a line of thunderstorms)**

9. The atmosphere is made primarily of:
    a. Carbon Dioxide
    b. Oxygen
    c. Nitrogen 78%
    d. Water Vapor
10. A portion of the mesosphere & thermosphere known for its ability to "bounce" radio signals is the _____
    a. Exosphere
    b. Ozone layer
    c. Ionosphere
        i. Ionosphere is also responsible from producing auroras
    d. Troposphere
11. A cP air mass has these two characteristics
    a. Cold and dry
        i. C is for continental, formed over land, dry air
        ii. P is for Polar, formed in cold climate area
    b. Cold and moist
    c. Warm and dry
    d. Warm and moist
12. Which has the lowest albedo?
    a. Grassy field
    b. Fresh snow
    c. Forest **Grass would have been next choice but it tends to be shiney**
    d. Clouds
    e. Ocean
13. Which of the follow most correctly describes sunspots
    a. The sunspot itself is cooler than the surrounding area (corona); the more sunspots, the less solar radiation the sun emits
    b. The sunspot itself is warmer than the surrounding area (corona); the more sunspots, the less solar radiation the sun emits
    c. The sunspot itself is cooler than the surrounding area (corona); the more sunspots, the more solar radiation the sun emits
        i. True, the sun spot itself is cooler, but the area on the spots edges are so much hotter that the net effect in increase in solar output.
    d. The sunspot itself is warmer than the surrounding area (corona); the more sunspots, the more solar radiation the sun emits
14. Approximately how many hours of daylight does a person standing on the South Pole receive on the summer solstice?
    a. 0
        i. Summer here is winter in southern hemisphere, which would make it their winter solstice, a time of no day light on that day.

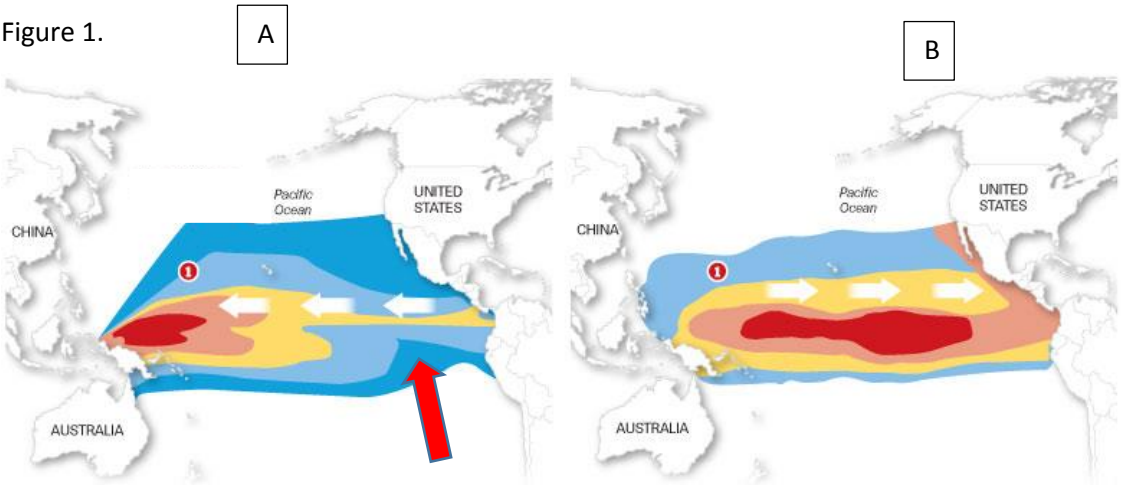
b. 12
c. 24
d. Varies depending on the obliquity cycle

15. Josh is standing at 30 degrees south latitude. What would be the measure of the angle between his line of sight and the apparent position of the sun on the winter solstice?
    a. 7.5 degrees
    b. 30 degrees
    c. 53.5 degrees
    d. 60 degrees
    e. 83.5 degrees
        i. **On the winter solstice (summer solstice in southern hemisphere) the sun is at 90 degrees over the Tropic of Capricorn 23.5 degrees south latitude. Because he is at 30 degrees (30-23.5 = 6.5) (90 degrees minus 6.5 = 83.5 degrees)**

Matching

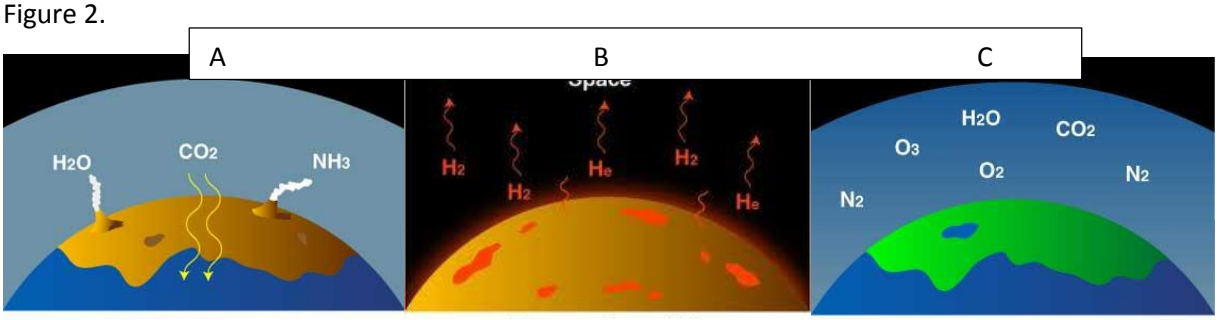
1. ___ tree rings	E. 700 years ago
2. ___ ice cores	C. 500,000 years ago
3. ___ instrumental records	A. 150 years ago
4. ___ coral bleaching	D. 30 years ago
5. ___ sediment cores	B. 1 million years ago

Figure 1.



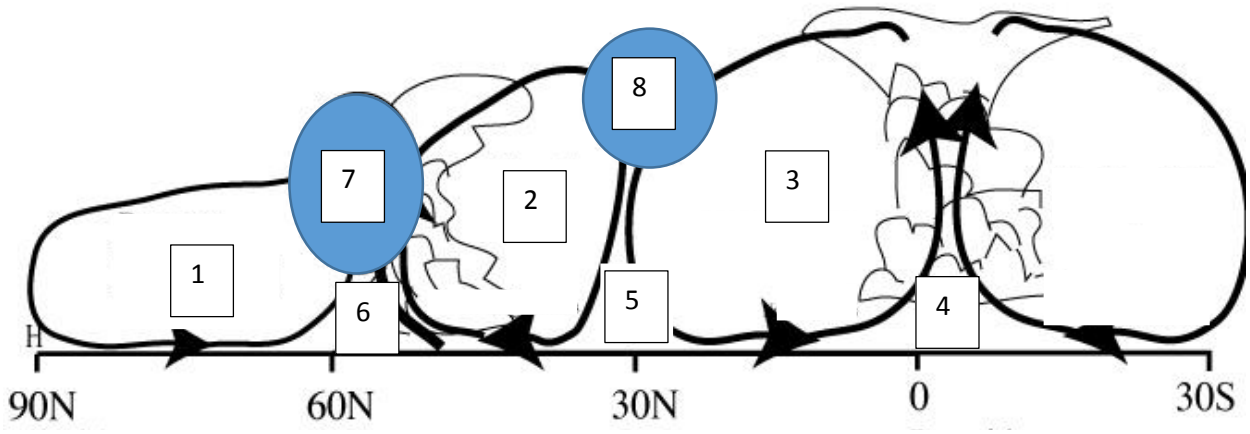
1. Which one of the drawings in Figure 1. Is El Nino? A or **B Remember El Nino is a reversing of the trade winds**
2. The red arrow in drawing A points to an area where deep cold water replaces the warm surface water. The is called:
    a. Upwelling
    b. Uprising
    c. Orographic Lifting
    d. Thermo-swelling
3. The air circulation pattern that is associated with an ENSO is the:
    a. Walker Cell
    b. Hadley Cell
    c. Rossby Wave
    d. Gulf Stream
    e.

Figure 2.



1. Which one of the pictures above depicts Earth's 1st atmosphere? _____**B 1st atmosphere was H2 and He2**
2. Earth's 3rd atmosphere was formed approximately A. 4.6 billion years ago B. 4.4 billion years ago C. 3.6 billion years ago **D. 2.6 billion years ago**

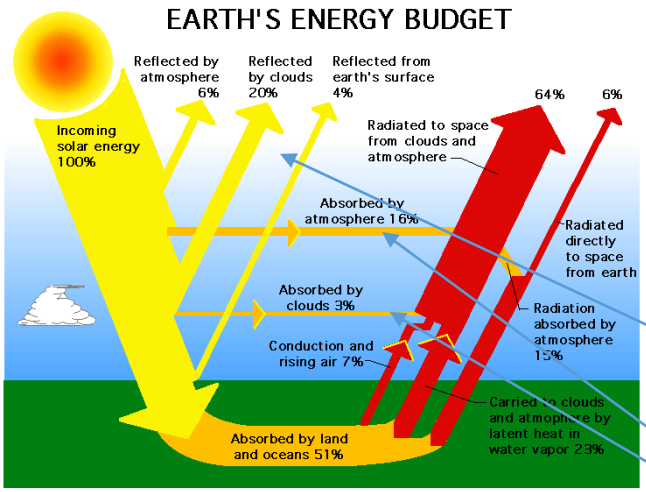
Figure 3.



1. _____D	A. Hadley Cell	B. Ferrell Cell
2. _____B	C. Walker Cell	D. Polar Cell
3. _____A	E. High Pressure	F. Low Pressure
4. _____G/F	G. ITCZ/Doldrums	H. Horse Latitude
5. _____E/H	J. Sub-Tropical Jet(High)	K. Sub-Polar Jet(Low)
6. _____F/K	L. Rossby Wave	M. ENSO
7. _____K/F		
8. _____J/H		

1-2-3 hadley-Ferrell-Polar, 4 is on equator so Doldrums/ICTZ. 5 is High Pressureas you have 2 converging downward air masses. 5 can also be the Horse Latitudes, 8 above it would be the sub-tropical High. 6 is 2 upward moving air masses so low pressure with 7 above it being the sub polar jet (low pressure)

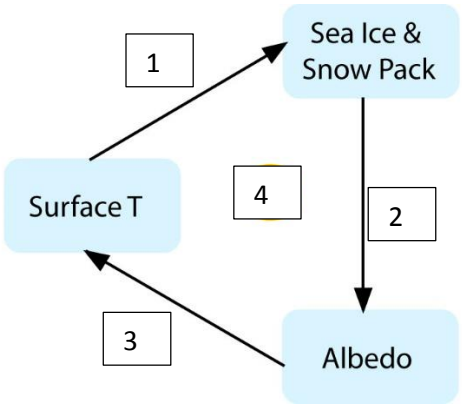
Figure 4.



1. What percentage of the incoming solar energy is reflected back? __6 + 20 + 4 + 30%_
2. What percentage of the incoming solar energy is absorbed? __**16 + 3 = 19%**_____
3. Is the energy represented by the red arrows, shortwave or **longwave**? ____**SHORT WAVE UV COMING IN, LONGWAVE HEAT ONCE IT BOUNCE OFF EARTH.**_____

Figure 5.

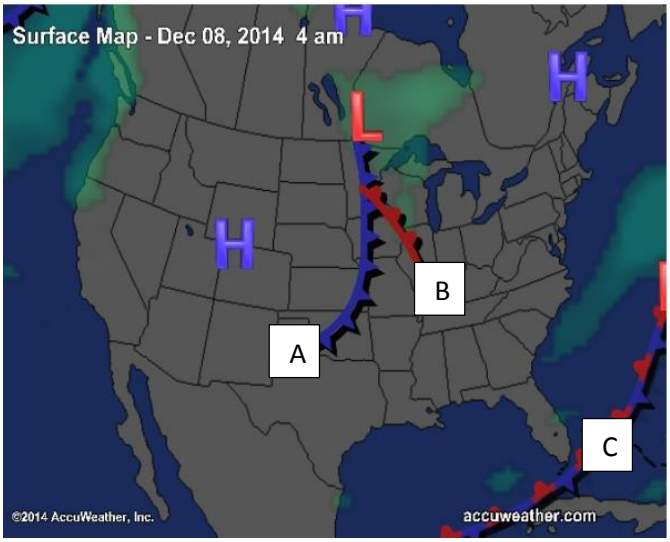
Feedback Loop



Feedback loops describe visually what type of impact one thing has on another. Example would be, if increase in surface temperature made the Snow pack increase, the box number 1 would have a plus sign, if it would make it decrease then you would put a minus sign in box number 1. Identify each block as a plus or minus in the feedback loop as well as the overall impact of the loop as either positive or negative in number 4. A plus is A, a Minus is B

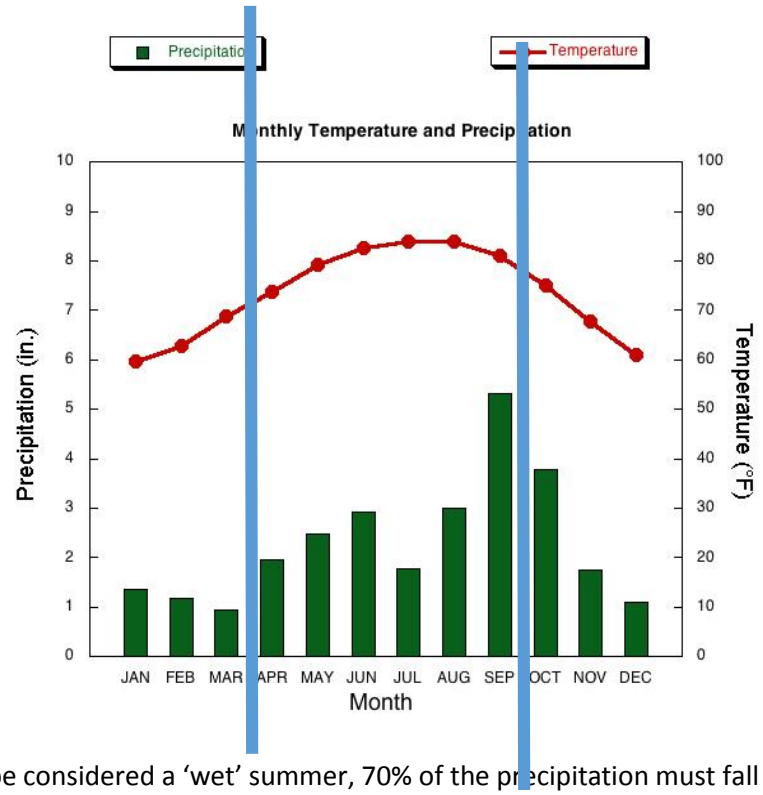
1.___-____ 2. ___+_____ 3. ___-_____ 4. ____+_____

Figure 6.



1. Front A will probably catch front B? **A if true**, B if false
    a. **FRONT a IS A COLD FRONT, COLD FRONTS MOVE FASTER THAN WARM FRONTS.**
2. "IF" front A were to catch from B, what type of front would it become?
    a. Dry-line
    b. Stationary
    c. **Occluded**
        i. **If you answered B, you could be right as well**
    d. Squall-line
3. What type of front is C?
    a. Dry-line
    b. **Stationary**
        i. **Front C is stationary, see how the red and blue symbols are on opposite sides?**
    c. Occluded
    d. Squall-line

Figure 7. North American City



1. To be considered a 'wet' summer, 70% of the precipitation must fall during that season. Is this cities summer considered: **1st thing you need to do is split the season to winter and summer, then collect the seasonal data. Probably not a great sample as depending if you rounded or not on each month, you could have been just above or below 70% precip for summer. So C or A could have been correct.**
    a. Wet
    b. Dry
    c. Neither
2. What is the annual average temperature? ___**70-74 degrees**____
3. What is the Koppen Classification of this city? _____ **Cwa or Csa**