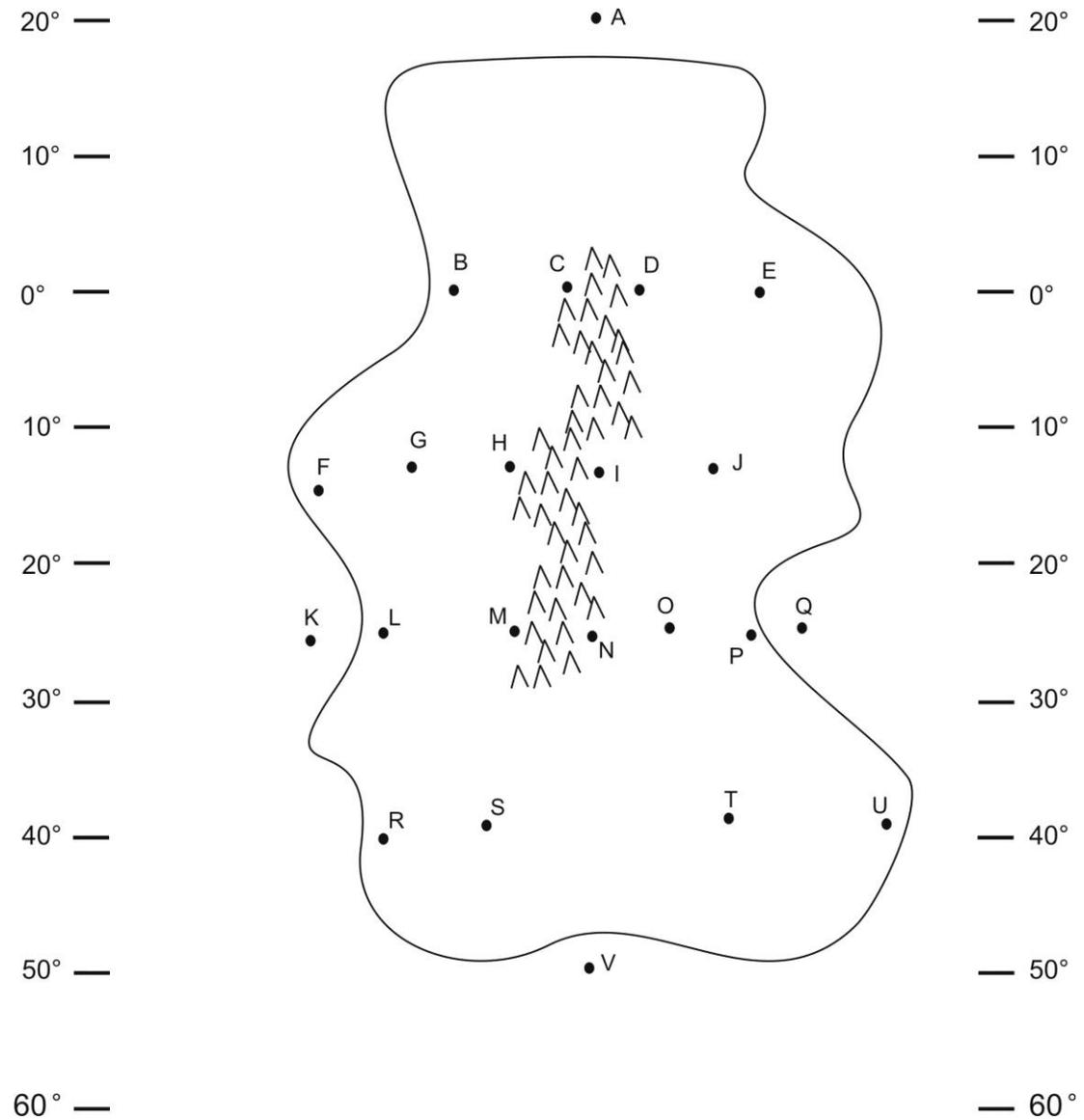


Name: \_\_\_\_\_

Part 1: Multiple Choice. Complete the map on the right. Then answer the questions below. Choose all of the answer choices that apply.

1. Which letter(s) is(are) in a high pressure belt?  
O
2. At which letter(s) does the wind blow toward the southeast?  
S U
3. At which letter(s) is there a cold current?  
K V
4. Which letter(s) is(are) in a major rainforest?  
D
5. Which letter(s) is(are) in a major desert?  
N
6. Which letter(s) is(are) in a coastal wet climate?  
R
7. Which letter(s) is(are) in a wet climate caused by the rain shadow effect?  
I
8. Which letter(s) is(are) in a dry climate caused by the rains shadow effect?  
H
9. Which letter(s) is(are) in a summer wet/winter dry climate?  
G J
10. Which letter(s) is(are) in a summer dry/winter wet climate?  
S
11. Which letter(s) is(are) in a humid climate?  
T
12. At which letter does the ocean current flow most directly Northward?  
K



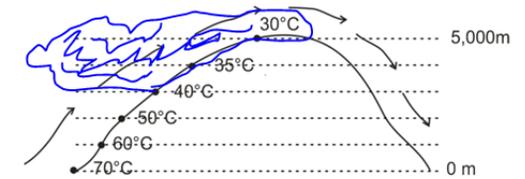
Part 2: Short answer Answer on a separate sheet of paper.

1. Describe the primary difference between weather and climate? **Weather is daily changes in the atmosphere. Climate is long term patterns.**
2. Which of the following is precipitation? Why? **snow, because it is water that is falling from the sky**
3. True or false: if the entire Earth's atmosphere had the same temperature, we would not have wind. **True, because there would not be rising and sinking air, and there would not be pressure differences. Winds would not occur without pressure differences.**
4. At what latitudes does air sink? **Around 25° and 90°**
5. If the Earth were a rotating disk, instead of a rotating sphere, would objects flying over the Earth's surface still experience the Coriolis Effect? Why? **Yes. Just like on a sphere, the outside edge of a disk moves faster than the center. It is this difference in speeds of the Earth's surface that causes the Coriolis Effect.**
7. What is the other name for the Doldrums? **ITCZ (Inter-tropical convergence zone)**
8. Explain why the Horse Latitudes was a troublesome place for sailors. **There is no wind for sailing (just sinking air), and there isn't much rain for drinking.**
9. "Down in the Doldrums" means depressed. What might be interpreted as depressing about the Doldrums? **There isn't much wind for sailing (just rising air) – but at least there is rain for drinking.**
10. If a prevailing wind in the Southern Hemisphere is blowing toward the Southeast, what does that tell you about the pressure belts that caused the wind? **There is a high pressure belt to its north, and a low pressure belt to its south.**
11. True or False: If there were no pressure belts, there would be no ocean surface currents. Explain your reasoning. **True. No pressure belts means no winds. No winds means no surface currents.**
12. True or False: If the Earth were entirely covered with ocean, surface currents would never flow directly toward the poles. **True. Currents only flow toward the poles when they hit continents. This would not happen if there were no continents.**
13. Virginia Beach, Virginia (letter A on map to right) is at approximately the same latitude as Monterey, California (letter B). Are you more likely to need a wetsuit when you swim at Virginia Beach or when you swim at the beach in Monterey? **A wetsuit is more important in Monterey, because it is on our west coast. West coasts generally have colder ocean currents.**
14. Why is Monterey generally drier than Virginia Beach? **The nearby ocean current is colder. Warmer currents produce higher humidity.**
15. What type of weather is generally found in high pressure belts? **Dry, calm weather**
16. Suppose a continent has no mountains, and the west coast of the continent is wetter than the east coast. What is the most likely reason for this difference in precipitation? **The wind must blow from west to east, so it hits the west coast after coming from the ocean, and it hits the east coast after coming from land.**
17. The east side of a mountain range is covered with lush vegetation, while the west side is much more similar to desert. Explain why. **The wind blows from east to west, so it is rising on the east side (wet) and sinking on the west side (dry)**
18. Suppose you have some water that is being heated. How can you tell if this added heat is latent heat? **One way is to monitor the temperature. If heat is being added, but the temperature is not changing, the added heat is latent heat. Latent heat only changes the phase of a substance; it does not alter temperature. Another way is to monitor the phase of the substance. If the water is in the process of melting or evaporating, latent heat is being added.**



19. Human sweat serves an important function. In order for sweat to serve this important function, does sweat need to take in latent heat or release latent heat? **The important function of sweating is to cool humans. In order to cool us, sweat needs to take in latent heat. It takes the heat from us, making us colder. The water in sweat uses that latent heat to evaporate from liquid into gas.**

20. The picture on the right shows some air passing over a mountain. If the wet and dry adiabatic rates are  $5^{\circ}/1000\text{m}$  and  $10^{\circ}/1000\text{m}$ , respectively, draw clouds where they should be forming. **Clouds are forming wherever the air is cooling at the wet adiabatic rate ( $5^{\circ}\text{C}/1000\text{m}$ ). Closer to the bottom of the mountain, the air is cooling fast (from  $70$  to  $60$  to  $50$  to  $40$ ). That is the dry adiabatic rate, so water is not condensing and clouds are not forming. Near the top of the mountain, the air cools more slowly ( $40$  to  $35$  to  $30$ ). That is the wet adiabatic rate, which means that water is condensing and clouds are forming. The wet adiabatic rate of cooling is slower because the condensing process releases latent heat and adds some warmth to the surrounding air, slowing its rate of cooling.**



21. True or False: If the Earth continued to orbit the sun, but its axis no longer tilted, we would still experience seasons, but those seasons would be different. Explain your reasoning. **False. If the Earth did not tilt, every location on the Earth would have the same day length all year (12 hours). Furthermore, the angle of the sunlight hitting each location would be the same every day of the year.**

23. True or False: Sunlight is always most direct at the equator. Explain your answer. **False: From March-September, the sun is more direct south of the equator. From September-March, the sun is more direct north of the equator.**

24. Which way do Monsoon winds blow during late winter? From ocean to land or from land to ocean? **They blow from land to ocean. Land cools down faster than ocean, so by late winter, land is colder. The air above the cold land is more dense and heavier (higher pressure) than the air above the warm ocean (lower pressure), and the wind blows from high pressure (land) to low pressure (ocean).**