Meteorology Test 2013

Instructions

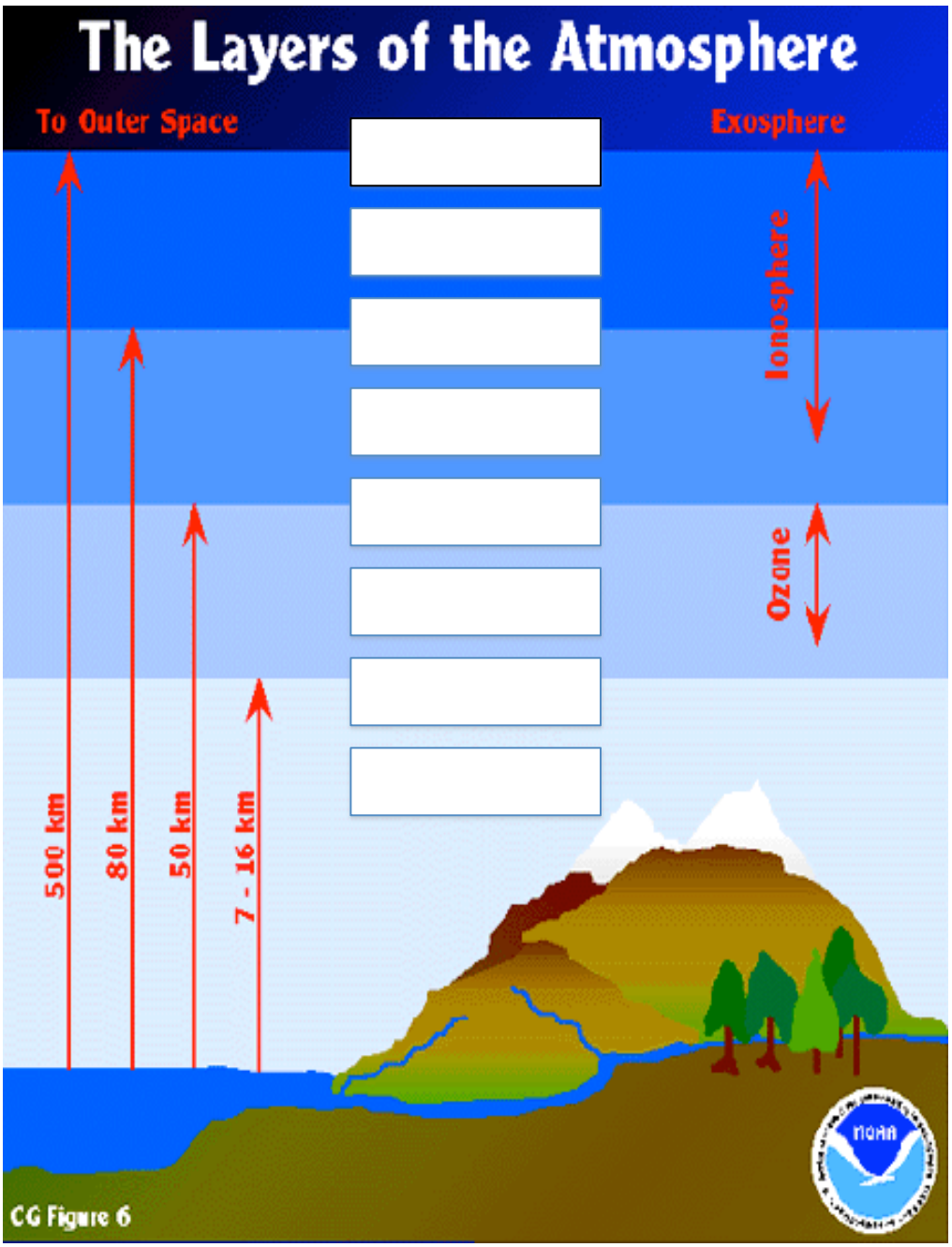
1. You have 50 minutes to complete this exam.
2. Do not turn this page until you are told to do so.
3. Write your team members' names and team number at the top of this page.
4. You may separate the pages of the test, but all pages must be put in order and stapled together before this test is handed in or 10 points will be deducted.
5. Any inappropriate comments will result in disqualification.
6. Ties will be broken by tiebreaker questions, then prime numbered questions in reverse order.
7. WRITE LEGIBLY. If we can't read it, it is wrong.

Meteorology Test

1. Name 3 factors necessary for thunderstorm formation.

2. During deposition, is latent heat released or absorbed?

3. Label the layers of the atmosphere on the diagram provided AND draw in the temperature curve to the right of the diagram



4. What is the difference in how advection fog and upslope fog are formed?

5. When Earth first formed, there were only trace of oxygen gas in the atmosphere. Why is there some much today? How much is there? (to the nearest 1%)

6. What is a gust front?

7. Do cold fronts move faster than warm fronts of do warm fronts move faster than cold fronts? Why?

8. What causes destruction of the ozone layer? Where is the destruction most prominent?

9. In what season is the jet stream strongest over North America? Why?

10. What type of electromagnetic radiation does Doppler radar use?

11. A front marks the boundary between two air masses. There is generally **not** a sharp change in which answer choice as a front passes?
a) cloud cover b) dew point c) precipitation d) pressure e) temperature

12. What is the mean atmospheric pressure at sea level on earth in millibars? (round to two decimal points)

13. How many Pascals are in 1 millibar?

14. What weather conditions are cumulonimbus clouds associated with? If they are present, what can you conclude about the stability of the air?

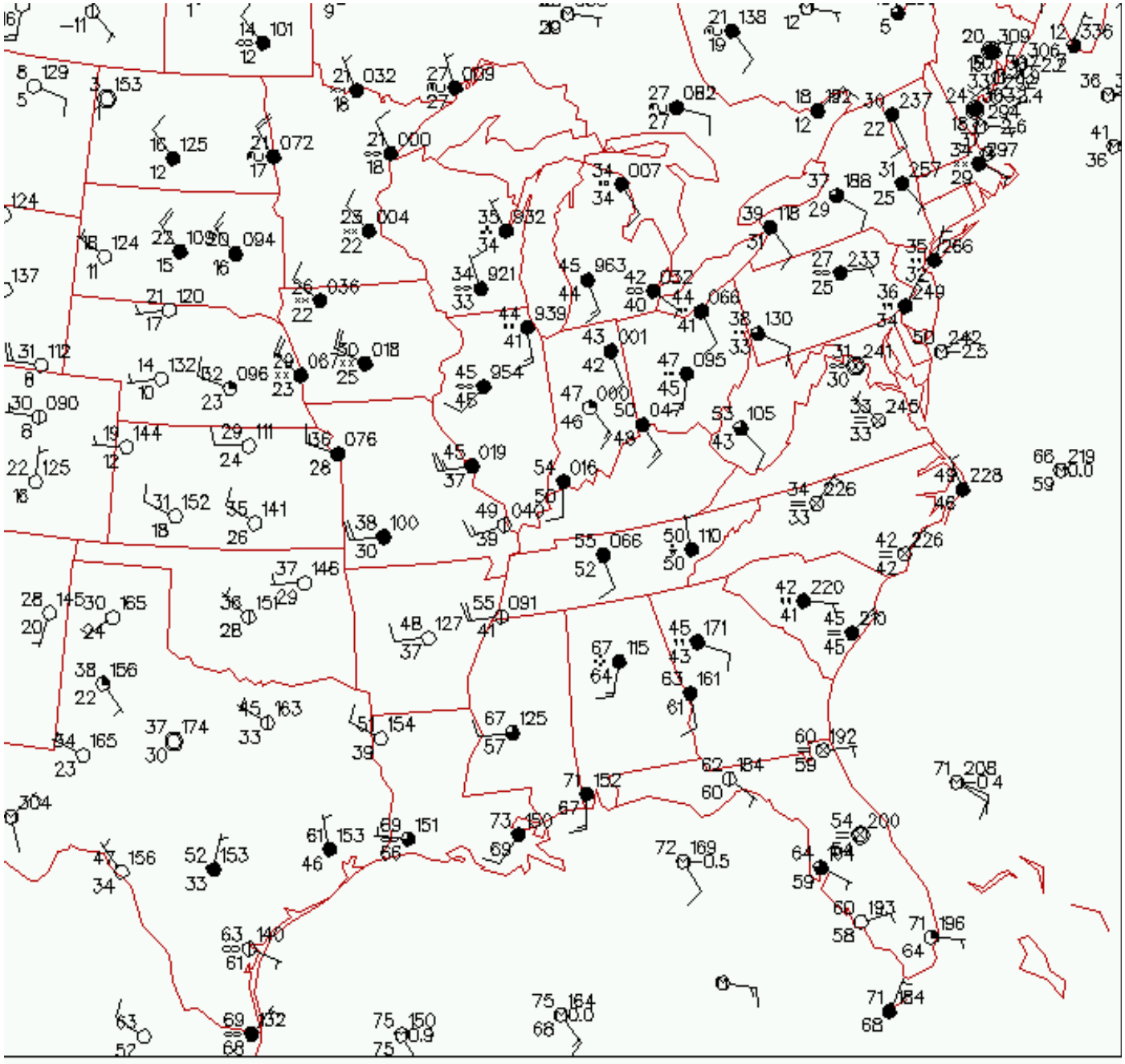
15. Draw a station plot for:
Temperature 67°F
Dew point 63°F
Overcast skies
strong thunderstorm
Atmospheric Pressure 1008.6 mb
Wind from SE at 20 knots

16. Why is the temperature highest during the afternoon?

17. Label 1 source region for each air mass type: cA, cP, cT, mP, mT

18. Why is the moist adiabatic lapse rate lower than the dry adiabatic lapse rate?

19. Draw isobars every 4 mb (one of the isobars should be at 1000 mb). Label an area of high pressure, and an area of low pressure. Draw warm, cold, and occluded fronts. (Ignore New England.)



20. What is the 3rd most common element in Earth's atmosphere?

21. There is a 4.0 km mountain. Wind is blowing a parcel of air that has a temperature of 35°C and a dew point of 15°C up and over this mountain. The dry adiabatic lapse rate is 10°C/km, the moist adiabatic lapse rate is 6°C/km, and the dew point lapse rate is 2°C/km.

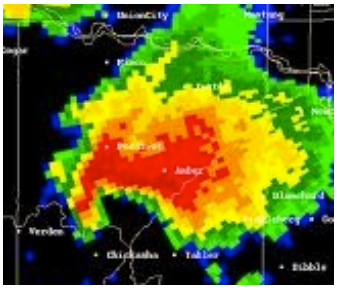
A) If the air was lifted forever, what height would clouds form at?

B) Will it rain on the mountain?

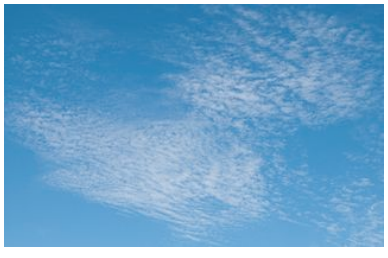
C) What will the temperature of the air be once it reaches ground level on the other side of the mountain?

22. If you see lightning and hear thunder 15 seconds later, how many miles away was the lightning?

23. What feature is shown in this radar image? What does it indicate?



24. What type of cloud is this?



25. What is the difference between cumulus humilis, cumulus congestus, and cumulus mediocris clouds?

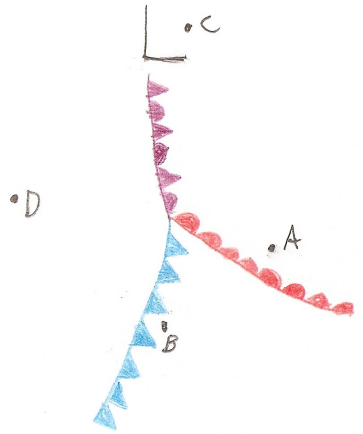
26. In this mid-latitude cyclone over land, which lettered cities (possibly none) are most likely to have (in the next few hours):

A) Continuous rain

B) Thunderstorms

C) Hurricanes

D) No precipitation



T1. What hurricane had the lowest recorded central pressure?

T2. Would the “blanket effect” be a better name for the greenhouse effect? Why?

T3. What was the most common element in Earth’s first atmosphere?