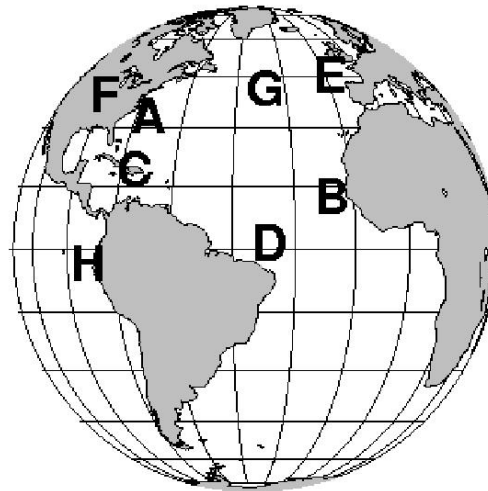


Name: _____

Weather, Climate and Society – ATMO336**Final Exam
May 11, 2000**

1. (10pts) Give an example of a positive feedback mechanism that would act to increase Earth's surface temperatures.

Questions 2–8 refer to the map below:



2. (5pts) Columbus in his trip to America used the winds at “B” to propel himself. What are these winds called? In what direction do these winds blow from?
3. (10pts) Hurricanes are most likely to occur in regions:
A B C D E F G H
and tend to form in regions:
A B C D E F G H
4. (5pts) The climate at “E” is influenced by what ocean current?
5. (5pts) Tornadoes are most likely to occur in region:
A B C D E F G H
6. (5pts) If you are at point “G” the winds are most likely to blow from the _____ (East, West, North, South)
7. (5pts) Upwelling might be occurring at point:
A B C D E F G H
8. (5pts) Which areas would be most affected by a complete melting of the Antarctic ice sheets?
A B C D E F G H
- 9.

(12pts) Classify the following gases as: Greenhouse gases (G); Toxic pollutants found in cities (P); or natural components of the atmosphere (N). **Note that some of these might correspond to more than one of the classes above. Circle all that apply.**

G P N hydrogen

G P N CFCs

G P N carbon dioxide

G P N water vapor

G P N ozone

G P N carbon monoxide

10. (10pts) Changes in eccentricity, obliquity, and precession are the three cyclic variations in the Earth's _____ that produce variations in the amount of _____ that falls on the earth.
11. (6pts) In the troposphere air temperature _____ (increases, decreases, stays the same), air pressure _____ (increases, decreases, stays the same), and air density _____ (increases, decreases, stays the same) as height increases.
12. (10pts) Name two climate controls that affect the climate of Tucson, Arizona.
13. (12pts) Classify the phenomena below as Weather (W) or Climate (C):
 W C today's record maximum temperature
 W C today's minimum temperature
 W C chance measurable precipitation today
 W C average number of thunderstorm days in July in Tucson
 W C the mean position of the ITCZ
14. (10pts) The _____ (oceans, ice caps/glaciers) are the largest reservoir of water at the Earth's surface and contain _____ (more than 95%, 95–85%) of the total water in the Earth system.
15. (10pts) The Natufians of Palestine are believed to have been the first culture to domesticate wild grains. Climate change might have played a role with _____ (warmer, cooler, wetter, drier) _____ (summers, winters).
16. (5pts) Plant respiration and photosynthesis are involved in the cycles of:
 A. carbon, water, and oxygen
 B. water, nitrogen, and oxygen
 C. carbon, water, and nitrogen
 D. water, hydrogen, and carbon
17. (5pts) In the stratosphere, ozone is destroyed naturally by emitting ultraviolet radiation.
 ____ True ____ False
18. (15pts) Explain what scientists mean when they refer to the carbon "missing sink".
19. (5pts) A severe decrease in the concentration of ozone in the ozone layer could NOT lead to the following harmful effects:
 A. A sharp increase in cataracts and sun burning.
 B. Adverse impact on crops and animals.
 C. An increase in the number of cases of skin cancer.
 D. Increase in the growth of ocean phytoplankton.
 E. None of the above, they are all right.
20. (5pts) The so-called "ozone hole" occurs over _____ (North America, Antarctica, the Arctic Ocean) during _____ (Summer, Fall, Winter, Spring).

21. (10pts) Name TWO anthropogenic sources of carbon monoxide (CO).
22. (10pts) What is the purpose of performing oxygen isotope analysis of ice cores?
23. (18pts) Given the list of “meteorological/science personalities” below on the left, link them to their area of expertise on the right :
- | | |
|------------------|--------------------------|
| A. Galileo | _____ Geology – Ice Ages |
| B. Torricelli | _____ Barometer |
| C. Angus Smith | _____ Thermometer |
| D. Louis Agassiz | _____ Earth’s orbit |
| E. Mario Molina | _____ Ozone hole |
| F. Milankovitch | _____ Acid rain |
24. (5pts) During the 1980’s low values of pH in rainfall (commonly know as acid rain) were found:
- A. Along the coast of Florida B. In the northwest United States
C. In the western United States
D. In northeast United States and Canada
25. (5pts) Nitrogen, carbon dioxide and water vapor are the main ingredients of the atmosphere.
____ True ____ False
26. (5 pts) Fossil and genetic evidence favors a model in which *Homo Sapiens* first speciated somewhere in Africa 1 to 2 million years ago.
____ True ____ False
27. (15pts) Explain what is meant by the terms “heat index” and “wind chill factor”.
28. (5pts) Photochemical smog results from the interaction of SO_x and NO_x and water vapor in the atmosphere.
____ True ____ False
29. (10pts) Given that the amount of water vapor in the air remains constant relative humidity _____ (increases, decreases, remains the same) as temperature increases and the dew point temperature _____ (increases, decreases, remains the same) as the temperature decreases.
30. (12pts) We are currently living during the _____ (Mesozoic, Cenozoic) era, the _____ (Tertiary, Quaternary) period, and the _____ (Holocene, Pleistocene) epoch.
31. (5pts) end of the Pleistocene epoch, a particularly rapid period of climate change occurred between 12,800 and 11,500 years ago. A _____ (positive, negative) feedback mechanism between large glacier melt and changes in the ocean circulation appears to caused it.
32. (5pts) The Coriolis force increases from zero at the equator to a maximum at the pole and as the wind increases.
____ True ____ False

33. (60pts)

- (a) Using facts discussed in class, make an argument **in favor** AND **against** the Greenpeace statement below.

“Governments should be leading the way to a fundamentally new energy direction based on clean renewable energy, like wind or solar power. But at present many governments instead use taxpayers’ money to support the agenda of the companies which continue to spend billions of dollars on development of coal, oil or gas – the climate-damaging fossil fuels.” (Greenpeace)

- (b) Now, use a different set of facts to make an argument **in favor** AND **against** the Western Fuels Association Inc. statement below.

“The Working Group argues that even if the EPA does have the authority to regulate greenhouse gas emissions, there is no sound scientific basis for doing so, and that any such regulation poses excessive and unnecessary costs on our society and economy. The Working Group’s response cites numerous scientific studies debunking the petitioners’ claims that there is ‘global warming’ and that carbon dioxide emissions are its cause.” (Western Fuels Association Inc.)

- (c) Which statement do you support and why?