Meteorology
Division B

Team Name: _____

Team Number: _____

Student Names: _____ and _____

You have 50 minutes to complete and revise this test.

1. Do not turn this page until you are told to do so.
2. Write your team name and number where given.
3. You can generally separate the test, but always ask
4. Write Legibly
5. Ties are broken by analysis questions.

PART 1: Clouds

1. For the following, list at what altitude they form and whether they release precipitation.

    a. Cirrocumulus:
    b. Cirrus:
    c. Cirrostratus:
    d. Altostratus:
    e. Altocumulus:
    f. Cumulus:
    g. Stratocumulus:
    h. Nimbostratus:
    i. Stratus:
    j. Cumulonimbus:

PART 2: El Nino and La Nina

1. What are the most likely changes to atmospheric temperature and precipitation along the west coast of South America during El Nino conditions?
2. List 3 phenomena that occur due to both El Nino and La Nina (e. g. dry or warm in x):

3. Match the following with the correct period of ENSO:

    a. Strong Trade Winds
    b. Weak Peruvian Current
    c. Stronger Walker Circulation in Central Pacific
    d. Weak Equatorial Counter-current
    e. Occurred in 1997-1998
    f. Occurred in 1998-1999

4. What is the SOI, and what is it based on?
5. How does upwelling due to El Nino impact fish and marine life?
6. During what months do El Nino and La Nina occur?
7. Explain the SST anomaly.

PART 3: Vocabulary

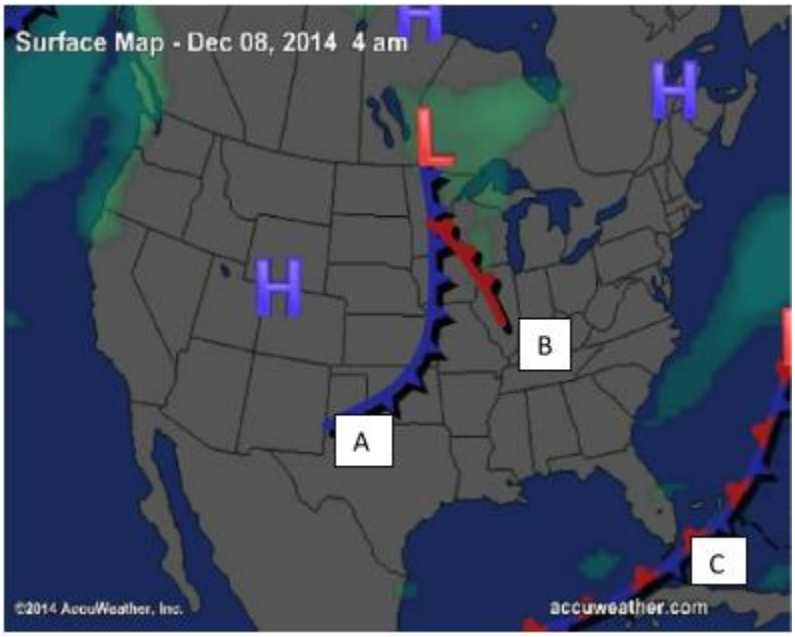
Match the following terms with their definitions.

A. Nephology	___: A long-lived, violent thunderstorm associated with a fast-moving band of severe thunderstorms.
B. Jet Stream	___: A measure of a fraction of reflected incident sunlight
C. Chinook	___: Foehn winds in the interior west of North America
D. Coriolis Effect	___: The study of clouds and cloud formation.
E. Ekman Transport	___: A boundary separating two masses of air of different densities
F. Albedo	___: Fast flowing, narrow air currents found in the atmosphere of planets.
G. Derecho	___: The net motion of fluid as the result of a balance between Coriolis and turbulent drag forces.
H. Radiosonde	___: The study of wind
I. Station Model	___: An instrument carried by balloon or other means to various levels of the atmosphere and transmitting measurements by radio.
J. Front	___: The deflection of a traveling object due to momentum.
K. Anemology	___: Symbolic illustrations showing the weather.

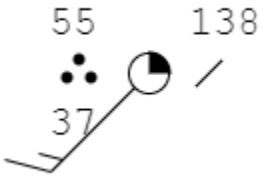
PART 4: The Modern Atmosphere

1. 3Explain each part of the Milankovitch Cycles (period, impact, current stage).
    a.
    b.
    c.
2. In what layer(s) of the atmosphere does a temperature inversion occur?
3. In what layer(s) of the atmosphere does temperature rise with altitude?
4. Name the four greenhouse gases with the highest warming potential
    a.
    b.
    c.
    d.
5. Why is argon the noble gas that is dominantly present in the atmosphere?

PART 5: Analysis

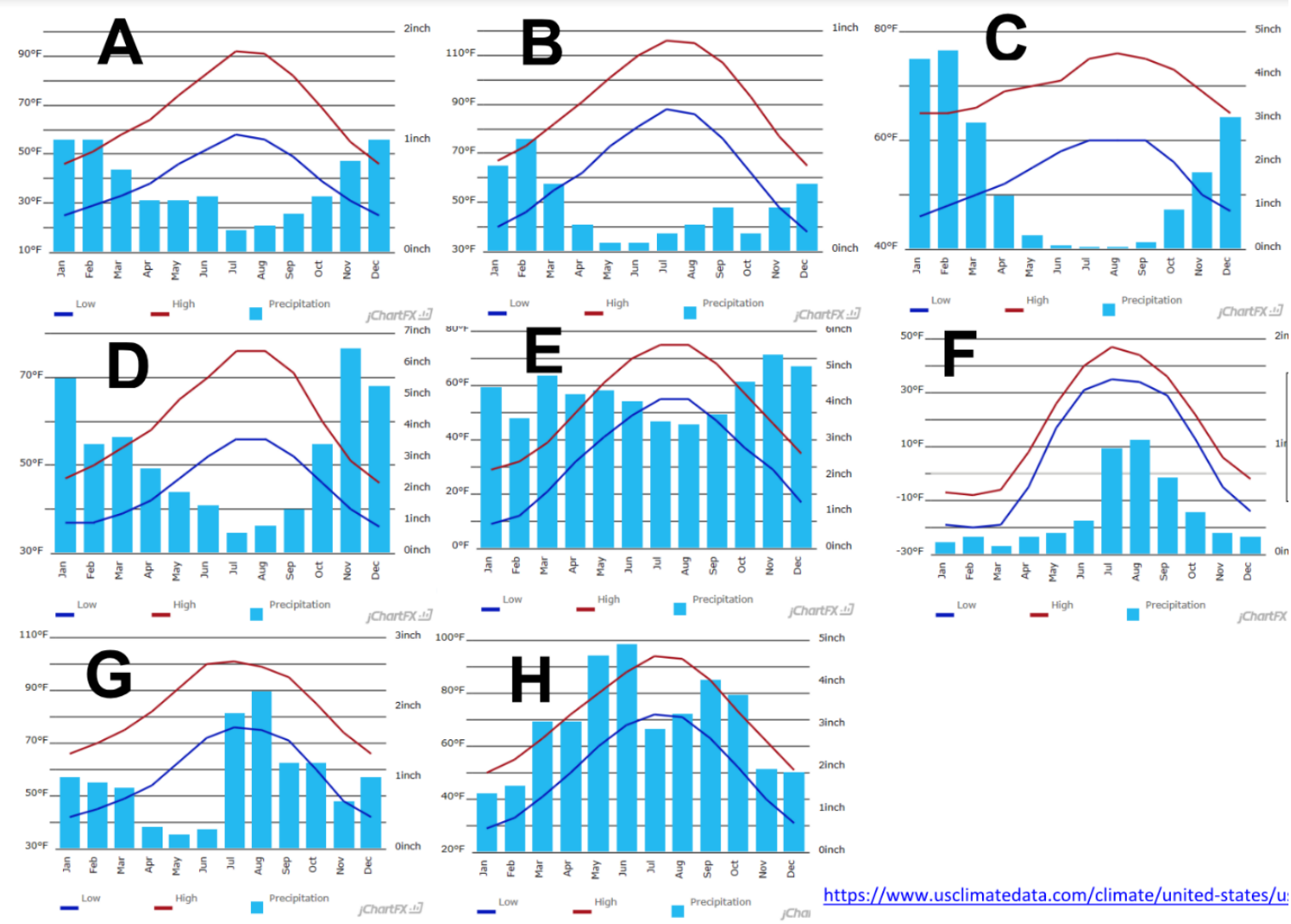


1. Will front A pass front B?
2. If it did, what phenomenon would occur?
3. What type of front is C?



4. For the above diagram, identify the temperature, wind direction, cloud cover, pressure change, dew point, wind speed, pressure, and current weather.
    a.
    b.
    c.
    d.
    e.
    f.
    g.
    h.

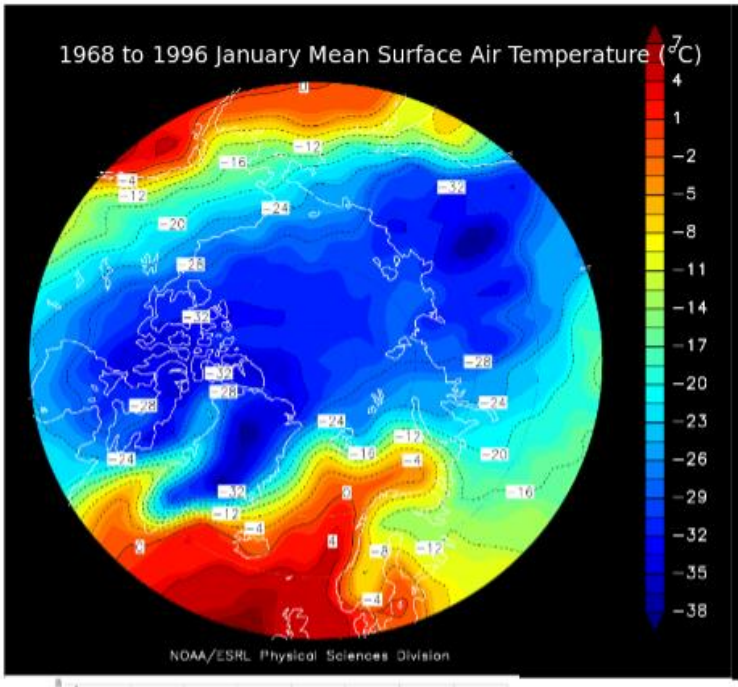
For problems 5-10 use the set of graphs below.

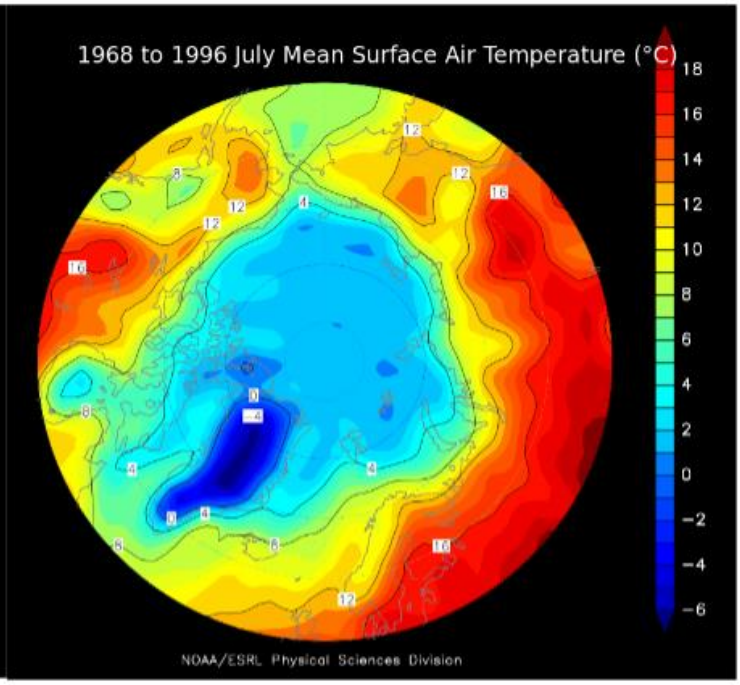


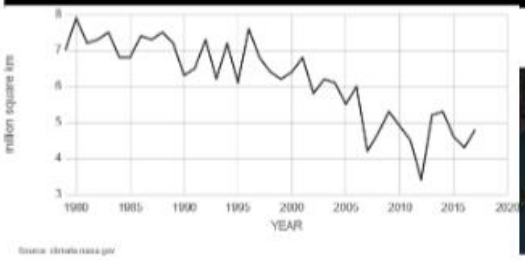
Which graph has the

5. Greatest seasonal variation in high temperatures
6. Greatest difference between high and low monthly rainfall amounts
7. Greatest difference between high and low temperatures in June, July, or August
8. Greatest total rainfall
9. List all graphs with “dry” summers and “wet” winters
10. List all graphs with “wet” summers and “dry” winters
11. Why would creating a 365-day forecast be virtually impossible? (answer in paragraph form)

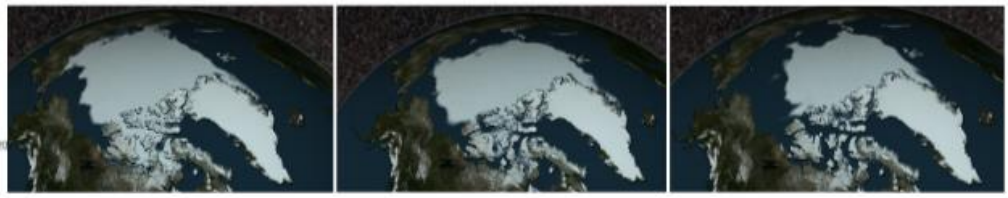
Use the diagram below to answer problems 12-17







Average September Extent of Ice



1975 **1995** **2015**

12. What is the approximate average surface temperature of the ice pack in July?
13. What is the approximate average surface temperature of the ice pack in January?
14. Since 1980, the sea ice pack has been (increasing/decreasing) at a (constant /decelerating) rate.
15. Given the July surface temperature of the ice pack, explain why the ice pack has not (answer to 14: been restored/melted) completely.
16. What environmental conditions might cause the ice to melt completely?
17. Given an average summer sea ice thickness of 1.5 m, estimate how much the sea level would rise if all the remaining sea ice from 1996 were to melt.