

Weather, Climate and Society – ATMO336

Second Exam March 7, 2000

Section 1. True/False (5 pts each)

- ___ The ratio of the air's water vapor content to its capacity is referred to as absolute humidity.
- ___ The dew point temperature is a good indicator of the air's actual water vapor content.
- ___ The region with fewest thunderstorms in the United States is the Pacific Coast and interior valleys.
- ___ Both air pressure and air density decrease with increasing altitude.
- ___ The strongest winds in a hurricane are found at the center of the storm.
- ___ When examining normalized hurricane damages in the United States (1925–1995), Pielke and Landsea concluded that the increases in losses during the last two decades are a result of climate fluctuations.
- ___ Two primary ways clouds form are: surface heating and convection, and divergence and lifting of surface air.
- ___ A cumulonimbus cloud may be composed of both liquid water and ice.
- ___ The Doppler radar is a meteorological instrument that measures the speed at which precipitation is moving toward or away from the observer.

Section 2. Multiple choice questions (5 pts each)

1. In a hurricane, the eye wall represents:
 - (a) the exact center of the storm
 - (b) the area of broken cloudiness at the center
 - (c) the region on light winds and low pressure
 - (d) the zone of intense thunderstorms around the center
 - (e) a layer of cirrus clouds in the center of the storm
2. The atmospheric pressure adjusted to an altitude of 0 km is referred to as:
 - (a) station pressure
 - (b) standard pressure
 - (c) pressure gradient
 - (d) sea level pressure
3. The Coriolis force is a result of:
 - (a) wind
 - (b) rotating earth
 - (c) day/night temperature contrast
 - (d) the poles being colder than the equator

4. On an infrared satellite picture, low warm clouds appear _____ and high cold clouds appear _____.
- (a) white, gray (c) gray, white
(b) white, white (d) gray, gray
5. In the winter you read in the newspaper that a large section of the Midwest is without power due to downed power lines. Which form of precipitation would most likely produce this situation?
- (a) snow (d) sleet
(b) hail
(c) freezing rain (e) rain
6. In the United States, tornadoes are most frequent during the _____, and least frequent during the _____.
- (a) summer, fall (d) summer, winter
(b) spring, winter
(c) spring, fall (e) winter, fall
7. Vasoconstriction is the process of:
- (a) constriction of skin blood vessels to reduce heat loss
(b) constriction of skin blood vessels to promote sweat secretion
(c) expansion of skin blood vessels to enhance blood flow
(d) expansion of skin blood vessels and flushing of the skin
(e) none of the above
8. Which of the following can influence wind direction?
- (a) Coriolis force (c) centrifugal force
(b) pressure gradient force (d) all of the above
9. One major cause of hurricane damage is the storm surge. The storm surge is the rising of the sea level. This process is not due to:
- (a) expansion of sea water with temperature
(b) the low pressure associated with the hurricane
(c) the high winds associated with the hurricane
(d) the high waves associated with the hurricane
10. The wind shear associated with several major airline crashes is believed to have been caused by:
- (a) microbursts (d) a narrow burst
(b) a funnel cloud
(c) a rain shaft (e) a mesocyclone

Section 3. Short Answer (15 pts each)

Please answer only 3 of the following 4 questions. If you answer all four, I will eliminate one question at random! Use extra blank pages provided.

1. Explain how sweat secretion and shivering are used by the human body in its thermoregulation process.
2. Classify the following clouds into low (L), middle (M), high (H), or clouds with vertical development (V):
 - (a) ____ cirrostratus
 - (b) ____ cumulonimbus
 - (c) ____ altostratus
 - (d) ____ stratocumulus
 - (e) ____ cirrus
3. The number of deaths in the United States attributable to hurricanes has continually declined over the last 50 years, but the number of tornado deaths has increased. Write an explanation to account for this situation.
4. Name three dangers that are associated with thunderstorms.