

Chapters 6, 7, 8 and 10 – Exam Thursday 3/22/2018

Vocabulary Words for True and False, and Multiple Choice

You are responsible for the following words:

Chapter 6	Chapter 7	Chapter 8	Chapter 10
Sea-Level Pressure	Microscale	Air mass	Air Mass
Isobar	Mesoscale	Source region (for air masses)	Thunderstorms
Anticyclone	Macroscale	Continental Polar (air mass)	Cumulus Stage
Pressure Gradient Force	Jet Stream	Continental Arctic (air mass)	Mature Stage
Coriolis Force	Sea Breeze	Maritime Polar (air mass)	Dissipating Stage
Geostrophic Wind	Land Breeze	Maritime Tropical (air mass)	Multi-cell
Gradient Wind	Valley Breeze	Continental Tropical (air mass)	Thunderstorm
Prevailing Wind	Mountain Breeze	Front	Overshooting Top
Wind Rose	Katabatic Wind	Stationary Front	Gust Front
Wind Vane	Chinook Wind	Cold Front	Supercell
Anemometer	Foehn Wine	Warm Front	Mesocyclone
Aerovane	Santa Ana Wind	Occluded Front (occlusion)	Wall Cloud
Wind Profiler	Haboob	Overrunning	Lightning
	Dust Devils	Polar Front Theory	Thunder
	Hadley Cells	Cyclogenesis	Stepped Leader
	Trade Winds	Nor'Easter	Return Stroke
	Westerlies	Alberta Clipper	Dart leader
	Doldrums	Panhandle Hook	Heat Lightning
	Horse Latitudes	Kona Low	Tornado
	Monsoon Wind System		Funnel Cloud
	Teleconnections		Suction Vortices
	El Niño		Fujita Scale
	La Niña		Enhanced Fujita
	Southern Oscillation		Scale
	Intertropical		
	Convergence Zone		

TOPICS YOU NEED TO KNOW – Chapter 6

- 1) Be able to explain how horizontal pressure differences are related to differences in air density.
- 2) Identify what type of air (i.e. warm, cold, dense or not) is associated with High pressures and Low pressures.
- 3) Know the value of standard atmospheric pressure at sea level in mb and in. Hg.
- 4) Know what isobars are and how to draw them on a map.
- 5) Be able to identify the three forces that influence the wind.
- 6) Be able to DRAW how each of the three or a combination of these forces effect wind direction.
- 7) Know where on Earth the Coriolis force is strongest and where it is weakest.
- 8) Identify what TWO things can affect the magnitude of the Coriolis force.
- 9) Be able to explain the difference between geostrophic wind and gradient wind.
- 10) Know which direction cyclones and anticyclones rotate in the Northern and Southern Hemispheres.
- 11) Explain the difference between convergence and divergence and how they relate to vertical air motion.
- 12) Be able to differentiate between different types of wind measuring instruments.

Chapter 6 Example True or False

- | | | |
|--|------|-------|
| 1) Due to the PGF wind always blows from Low to High Pressure. | True | False |
| 2) Isobars are lines of constant Pressure. | True | False |
| 3) Lower level Convergence is usually underneath upper level Divergence. | True | False |
| 4) Wind Profilers only give you information about wind direction at the surface. | True | False |
| 5) High Pressure regions are denser than regions of Low Pressure. | True | False |

Chapter 6 Example Multiple Choice

- 6) Which of these forces is responsible for wind curving to the right in the northern hemisphere?
- | | |
|----------------------|----------------------------|
| a. Friction | b. Pressure Gradient Force |
| c. Centrifugal Force | d. Coriolis |
- 7) Which wind measuring device gives you only wind direction?
- | | |
|---------------|------------------|
| a. Anemometer | b. Aerovane |
| c. Wind Vane | d. Wind Profiler |
- 8) Which forces are acting on a Gradient Wind?
- | | |
|--------------------------------|--------------------------|
| a. PGF and Coriolis | b. PGF and Friction |
| c. PGP, Coriolis, and Friction | d. Coriolis and Friction |
- 9) Anticyclones rotate in which direction in the Southern Hemisphere?
- | | |
|-----------------------------------|------------------------------------|
| a. Clockwise, Spiraling In | b. Clockwise, Spiraling Out |
| c. Counterclockwise, Spiraling In | d. Counterclockwise, Spiraling Out |
- 10) The PGF, alone, acts to pull wind in which direction relative to the isobars?
- | | |
|------------------|----------------|
| a. To the right | b. Parallel |
| c. Perpendicular | d. To the Left |

TOPICS YOU NEED TO KNOW – Chapter 7

- 1) Be able to give the time scale, length scale and an example of microscale, mesoscale and macroscale winds.
- 2) Be able to describe and recognize diagrams of sea, land, valley and mountain breezes.
- 3) Explain the formation of Country Breezes and how they are related to the Urban Heat Island effect.
- 4) Know the differences and similarities between Chinook, Foehn, Katabatic and Santa Ana winds.
- 5) Be able to explain what a monsoon is and identify parts of the Asian Monsoon in a diagram.
- 6) Be able to describe a Haboob and a dust devil.
- 7) Be able to explain the difference between the “single-cell” and “three-cell” model of Earth’s winds.
- 8) Be able to describe the wind direction, wind name and latitude boundaries for the Hadley Cell.
- 9) Be able to describe the wind direction, wind name and latitude boundaries for the Ferrell Cell.
- 10) Be able to describe the wind direction, wind name and latitude boundaries for the Polar Cell.
- 11) Explain the importance of the trade winds and the westerlies.
- 12) For the doldrums and horse latitudes, know their latitudes and why they are special.
- 13) Be able to explain how jet streams are formed.
- 14) Be able to explain the role that jet streams play in determining weather in the US.
- 15) Explain what an El Niño event is and what the climate impacts are in Australia, South America and the US.
- 16) Explain what a La Niña event is and how it is related to El Niño.
- 17) Define Teleconnection and how this term relates to El Niño, La Niña and the Southern Oscillation.

Chapter 7 Example True or False

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|---|------|-------|
| 1) Leaves blowing in your yard is an example of a Microscale Wind. | True | False |
| 2) Foehn winds occur in the Rocky Mountains. | True | False |
| 3) The main wind belt found in the Ferrell Cell is known as the Polar Easterlies. | True | False |
| 4) When an El Niño occurs Australia experiences an increase in precipitation. | True | False |
| 5) Monsoons only happen in Asia. | True | False |

Chapter 7 Example Multiple Choice

- 6) Which wind do we find in the Hadley Cell?
- | | |
|----------------|---------------------|
| a. Westerlies | b. Polar Easterlies |
| c. Trade Winds | d. Chinook |
- 7) Dust Devils are triggered by what type of event?
- | | |
|--------------------------------|---------------------------------------|
| a. Thunderstorm Outflow | b. Wind passing over a small obstacle |
| c. Cooling of the land surface | d. Wind passing over a mountain |
- 8) Which is an example of a Mesoscale Wind?
- | | |
|---------------|---------------|
| a. Westerlies | b. Hurricane |
| c. Wind Gusts | d. Sea Breeze |
- 9) In the Single Cell model of the atmosphere which way did wind travel at the surface?
- | | |
|----------------------------------|----------------------------------|
| a. From the Equator to 30 N/S | b. From 30 N/S to the Equator |
| c. From the Equator to the Poles | d. From the Poles to the Equator |
- 10) During which Northern Hemisphere season does El Niño begin?
- | | |
|-----------|-----------|
| a. Summer | b. Winter |
| c. Fall | d. Spring |

TOPICS YOU NEED TO KNOW – Chapter 8

- 1) Be able to describe the moisture and temperature characteristics for mT, mP, cT and cP air masses.
- 2) Be able to describe and sketch a warm front, know the speed, changes in wind direction and slope.
- 3) Be able to describe the type of weather associated with a warm front.
- 4) Be able to describe and sketch a cold front, know the speed, changes in wind direction and slope.
- 5) Be able to describe the type of weather associated with a cold front.
- 6) Be able to explain how stationary, warm, cold and occluded fronts are related to Cyclones.
- 7) Be able to describe the typical life cycle of a Mid-Latitude Cyclone.
- 8) Be able to list the main regions for cyclogenesis and the names associated with each type.
- 9) Be able to describe and sketch a dry line and know why it is important for weather in the southwest.

Chapter 8 Example True or False

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|--|------|-------|
| 1) cP air is generally dry and cold. | True | False |
| 2) Warm fronts are characterized by light precipitation over a small area. | True | False |
| 3) I would expect to see Thunderstorms and maybe hail at a cold front. | True | False |
| 4) Mid-Latitude Cyclones usually start out as an Occluded Front. | True | False |
| 5) Alberta Clippers originate in the Gulf of Mexico. | True | False |

Chapter 8 Example Multiple Choice

- 6) What type of weather would you expect to see at a dry line if there is very moist air involved?
- a. Light Rain
 - b. Stratus clouds but no rain
 - c. Clear Skies
 - d. Thunderstorms
- 7) During which period in a Mid-Latitude Cyclones life has the cold front caught up to the warm front?
- a. Mature Stage
 - b. Occluded Stage
 - c. Dissipating Stage
 - d. Cyclogenesis Stage
- 8) How fast does a warm front travel?
- a. 20-35 mph
 - b. 10-25 mph
 - c. 25-35 mph
 - d. 15-20 mph
- 9) What type of weather would you expect at a cold front?
- a. Clear Skies
 - b. Cirrus Clouds but no Rain
 - c. Thunderstorms
 - d. Light Rain
- 10) Which air mass type am I likely to find in Canada?
- a. mT
 - b. cT
 - c. mP
 - d. cP

TOPICS YOU NEED TO KNOW – Chapter 10

- 1) Be able to list the main “ingredients” needed to make a thunderstorm.
- 2) Be able to describe the three different life-cycle stages of ordinary air mass thunderstorms.
- 3) Describe Supercell storms and identify how they are different then an air mass thunderstorms.
- 4) Know the criteria for a storm to be classified as severe.
- 5) Be able to describe the different parts of a Supercell Thunderstorm.
- 6) Be able to describe the process that causes lightning and thunder.
- 7) Be able to calculate how far away a storm is based on the timing of thunder and lightning flash.
- 8) Be able to identify the different types of lightning.
- 9) Be able to describe how a tornado forms and the role of the mesocyclone.
- 10) Be able to identify the three different types of tornadoes (weak, strong, violent).
- 11) Be able to identify the Fujita Scale rating for an event based the observed destruction.

Chapter 10 Example True or False

- | | | |
|--|------|-------|
| 1) Thunderstorms need warm, moist, and stable air to form. | True | False |
| 2) A severe storm would need to have winds faster than 58 mph. | True | False |
| 3) Intra-cloud lightning goes from one cloud to another in a different cell. | True | False |
| 4) An EF5 tornado can damage stone and steel reinforced structures. | True | False |
| 5) You can have thunder without lightning. | True | False |

Chapter 10 Example Multiple Choice

- 6) Another word for the “mini cold front” associated with a supercell storm is a _____
- a. Overshooting Top
 - b. Gust Front
 - c. Anvil
 - d. Wall Cloud

- 7) During which period in a Mid-Latitude Cyclones life has the cold front caught up to the warm front?
- a. Mature Stage
 - b. Occluded Stage
 - c. Dissipating Stage
 - d. Cyclogenesis Stage
- 8) Which type of tornado looks like a rope?
- a. Violent
 - b. Strong
 - c. Weak
 - d. Supercell
- 9) What term is used to describe the discharge of electrons after the step-leader first touches the ground?
- a. Dart Leader
 - b. Leader
 - c. Ionized Air
 - d. Return Stroke
- 10) If you hear thunder 5 seconds after you see a flash of lightning, how far away was the lightning strike?
- a. 500 ft
 - b. 5000 ft
 - c. 500 mi
 - d. 5000 mi