ATMO 101 – Introduction to Meteorology Midterm Study Sheet

Chapters 11, 13, 14 and 15 – Exam Tuesday 5/9/2017 Noon-2pm

Vocabulary Words for True and False, and Multiple Choice

You are responsible for the following words:

Chapter 11	Chapter 13	Chapter 14	Chapter 15
Tropical Wave	Climate Change	Air Pollutants	Reflected Light
Hurricane	Dendrochronology	Primary Air Pollutants	Scattered Light
Typhoon	Ice Age	Secondary Air Pollutants	Crepuscular Rays
Tropical Cyclone	Interglacial Period	Particular Matter	Refraction
Eye	Younger Dryas	PM 2.5	Green Flash
Eyewall	Mid-Holocene Maximum	PM 10	Mirage
Tropical Depression	Little Ice Age	Carbon Monoxide (CO)	Inferior Mirage
Tropical Storm	Global Warming	Sulfur Dioxide (SO_2)	Superior Mirage
Storm Surge	Positive Feedback	Volatile Organic Compounds (VOCs)	Halo
Saffir-Simpson Scale	Negative Feedback	Hydrocarbons	Dispersion
Hurricane Watch	Theory of Plate Tectonics	Nitrogen Dioxide (NO_2)	Sun Dog
Hurricane Warning	Milankovitch Cycles	Nitric Oxide (NO)	Sun Pillars
	Eccentricity	Smog	Rainbow
	Precession	Photochemical Smog	Double Rainbow
	Obliquity	Ozone	Corona
	Maunder Minimum	Ozone Hole	Diffraction
	Sulfate Aerosols	Temperature Inversion	
	Radiative Forcing	Acid Rain	

TOPICS YOU NEED TO KNOW – Chapter 11

1) Be able to list the three specific main criteria and three general requirements for hurricane formation.
2) Know what wind speed determines if a storm is a Tropical Storm or a Hurricane.
3) Be able to list the different names for hurricanes and in which region the names are used.
4) Be able to describe and sketch the structure of a hurricane (see Fig 11.3 in text).
5) Be able to explain why hurricanes in the Atlantic follow a relatively consistent path.
6) Explain how hurricanes are named (when do they get a name, the naming conventions).
7) Be able to list and describe in detail the different types of damage associated with hurricanes.
8) Be able to explain what can intensify a hurricane.
9) Be able to explain what can weaken a hurricane.
10) Be able to distinguish between a hurricane watch and hurricane warning.

Chapter 11 Example True or False

1) Storms known as Typhoons are found in the Atlantic Ocean.	True	False
2) Hurricanes need deep cold water to form.	True	False
3) Hurricanes consist of many thunderstorms.	True	False
4) Hurricanes can form in the Mid-Latitudes.	True	False
5) Hurricanes weaken as the travel over land surfaces.	True	False

Chapter 11 Example Multiple Choice

6) Which term is NOT another name for a Hurricane?

a. Tropical Storm b. Typhoon
c. Cyclone d. Tropical Cyclone

7) Which type of damage due to hurricanes tends to cause the most fatalities?

a. Storm Surge b. Wind
c. Flooding d. Debris

8) What global wind is responsible for causing Atlantic Hurricane paths to curve to the North East?

a. Trade Winds b. Polar Easterlies
c. Easterly Waves d. Westerlies

9) Winds associated with Hurricanes rotate in which direction in the Northern Hemisphere?

a. Clockwise, Spiraling In b. Clockwise, Spiraling Out
c. Counterclock wise, Spiraling In d. Counterclockwise, Spiraling Out

10) How would you describe the weather in the eye of a Hurricane?

a. Rising air, generally clear skies b. Subsiding air, generally cloudy skies
c. Rising air, generally cloudy skies d. Subsiding air, generally clear skies

TOPICS YOU NEED TO KNOW – Chapter 13

1) Know the Climate Proxies: do you get Temp and/or Precip from each and how far into the past.
2) Know the difference between interglacial periods and Ice Ages.
3) Know what the Younger-Dryas and Mid-Holocene Maximum are and when they happened.
4) Know what the Medieval Warm Period and Little Ice Age are and when they happened.
5) Know what the FOUR main climate controls are.
6) Know what the Milankovitch Cycles are, the periodicity of each and how they each affect climate.
7) Be able to identify and describe both a positive and negative feedback with respect to climate.
8) Be able describe how volcanic eruptions effect climate.
9) Be able to describe both the direct and indirect effect of aerosols.
10) How has global temperature changed in the last 1000 years? Why?
11) Be able to describe the heating pattern due to the radiative effect of CO_2.
12) Be able to describe the heating pattern due to the radiative effect of sulfate aerosols.
13) What is the Keeling Curve and why is it important for climate studies?
14) Describe how global temperature and precipitation are predicted to change in the future.
15) What is the IPCC and why is it important?
16) Know the two processes that contribute to sea level rise.

Chapter 13 Example True or False

1) Obliquity and Tilt are the same thing.	True	False
2) The locations of the continents on Earth has an impact on climate.	True	False
3) The rate of temperature increase in the last 1000 years is unprecedented.	True	False
4) In general the direct effect of aerosols causes a reduction in temperature.	True	False
5) When ice bergs melt they contribute to sea level rise.	True	False

Chapter 13 Example Multiple Choice

6) Which climate control is related to Earth's distance from the sun?

a. Solar output fluctuations
b. Milankovitch Cycles (orbital parameters)
c. Distribution of the continents
d. Amounts of gases and particles in the atmosphere

7) The Medieval Warm Period happened during which years?

a. 1950-2010
b. 250-950
c. 1250-1650
d. 950-1250

8) What atmospheric gas is shown on the Keeling Curve?

a. CH_4
b. SO_2
c. CO_2
d. NO_x

9) Tree rings or dendrochronology provide information about what?

a. temperature
b. past fire occurrence
c. precipitation
d. all of the above

10) Which paleoclimate proxy has the shortest record?

a. Ice Cores
b. Coral Cores
c. Tree rings
d. Pollen

TOPICS YOU NEED TO KNOW – Chapter 14

1) Be able to describe the difference between primary and secondary pollutants.
2) Give examples (list) of primary pollutants. Give examples (list) of secondary pollutants.
3) Know the effects of PM2.5 and if it is a primary or secondary pollutant.
4) Be able to describe the "Six Cities Study" and how it is related to air pollution and health.
5) Know the main sources for Sulfur Dioxide (SO_2), its climate, weather and health effects.
6) Know how NO_2 is formed, its main sources, and its environmental effects.
7) Know what Vog is, where it comes from and its health effects.
8) Know what VOCs are, their main sources, and if they are primary or secondary pollutants.
9) Be able to describe the differences between "Good Ozone" and "Bad Ozone"
10) Be able to describe what the "Ozone Hole" is and how scientists and governments responded to it.
11) Know the main sources of Carbon Monoxide (CO) and its health effects.
12) Know what SMOG is, if it is a primary or secondary pollutant and its health effects
13) Explain the difference between Industrial Smog and Photochemical Smog.
13) Describe the process and the pollutants involved in "Acid Rain" formation and the main effects.
14) Describe the role of weather, specifically inversions, in pollution events.
15) Know what nuclear fallout is, what region has experiences the most, and how weather is realted.
15) List the main indoor air pollution hazards and their major health effects including lead, radon, environmental tobacco smoke, mold, bacteria, formaldehyde, carbon monoxide, VOCs, animal dander, Chloroform, asbestos, particulate matter, nitrogen oxides, pollen.

Chapter 14 Example True or False

1) Industrial smog is usually associated with burning coal. True False
2) Lead is considered a secondary pollutant. True False
3) Acid Rain can damage lakes by raising the pH of the water. True False
4) PM 10 is usually produced via combustion processes. True False
5) The Caribbean Islands where the sites of many nuclear tests. True False

Chapter 14 Example Multiple Choice

6) Which is an air pollutant that can cause neurological damage?
   a. Asbestos b. Carbon Monoxide
   c. Pollen d. Animal Dander

7) Good ozone is found in which layer of the atmosphere?
   a. Mesosphere b. Troposphere
   c. Stratosphere d. Thermosphere

8) Which primary pollutant is associated with acid rain?
   a. SO_2 b. PM 2.5
   c. Lead d. CO

9) What used to be the main source of atmospheric lead pollution?
   a. Wood Burning b. Coal
   c. Cleaning Supplies d. Gasoline

10) What type of natural air pollutant can be exacerbated by human activities?
   a. Volcanoes b. Sea Salt
   c. Fire d. Pollen

TOPICS YOU NEED TO KNOW – Chapter 15

1) Know why the sky is blue, sunsets are red, and hazy days are white.
2) Know what refraction, reflection, diffraction and scattering are.
3) Be able to explain how inferior and superior mirages form.
4) Know what type of phenomena is a “Fata Morgana” is and why it is special.
5) Describe how a Glory and a Corona form.
6) Be able to draw and describe how a single rainbow forms (i.e. what happens in a single rain drop).
7) Be able to draw and describe how a double rainbow forms.
8) Know what time of day is best for seeing rainbows and why.
9) Know how Halos (22 degree and 46 degree) form.
10) Know why Halos are white and not rainbow colored.
11) Be able to describe how Sun Dogs form.
12) Be able to describe how Sun Pillars form.
13) For Rainbows, Halos, Sun Dogs, and Sun Pillars identify if they form due to ice or liquid drops.

Chapter 15 Example True or False

1) The Fata Morgana is an inferior mirage. True False
2) You can see a Sun Pillar at noon. True False
3) The sun has to be at your back in order to see a Rainbow. True False
4) Coronas are formed due to the presence of ice crystals. True False
5) Mirages are caused by the reflection of light only. True False

Chapter 15 Example Multiple Choice

6) Of the terms listed below which is responsible for the formation of coronas?

a. Reflection b. Scattering
c. Refraction d. Diffraction

7) Which optical phenomena is NOT a result of light interacting with ice crystals?

a. Glory b. Sun Dogs
c. Sun Pillars d. 22 degree Halos

8) Inferior mirages occur when _____.

a. The surface air is cold and the air aloft is warm
b. The surface air is warm and the air aloft is warm
c. The surface air is cold and the air aloft is cold
d. The surface air is warm and the air aloft is cold

9) Which optical phenomena looks like two bright spots on either side of the sun?

a. Sun Dog b. Sun Pillar
c. 46 degree Halo d. Glory

10) Sunsets are red a result of which process?

a. Diffraction b. Scattering
c. Refraction d. Reflection