

ATMO 101 – Weather & Climate

Spring Semester 2020

PRACTICE MIDTERM 2 EXAM

Name: _____

Student ID #: _____

Instructions: Closed Book. Time limit is 1 hour 15 minutes. **Total Points Attainable: 100**

Part A: True or False

Instructions: This section is worth a total of 40 points, each answer is worth 2 points. Answer true or false to each of these statements by marking “T” or “F” on the blank line in front of each statement.

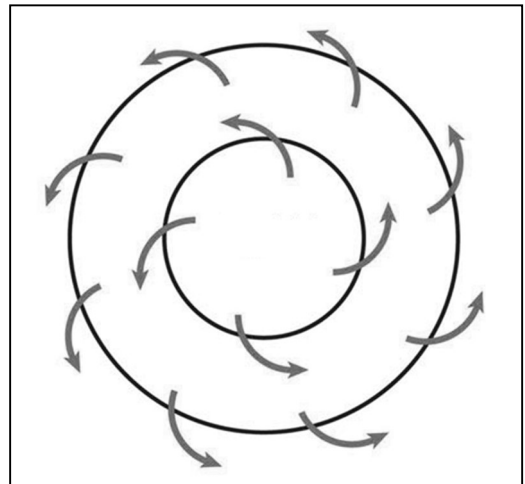
T	F	Statement
T	F	1) The ITCZ is a region of LOW pressure that circles the globe around the equator and can be seen from space due to the copious amounts of clouds formed due to rising air.
T	F	2) A cold front moves faster than a warm front.
T	F	3) Warm front weather is typically violent for a short duration over a small area.
T	F	4) The doldrums are located at 30°N and 30°S latitudes where we find the mid-latitude jet stream and the polar front.
T	F	5) Supercell thunderstorms are known to produce violent tornadoes.
T	F	6) The Coriolis Force causes objects above the surface of the Earth to veer to the right in the northern hemisphere and to the left in the southern hemisphere.
T	F	7) Lightning is a visible electrical discharge produced by warm fronts.
T	F	8) When pressure is presented on a map using isobars, all the pressure readings are corrected to sea-level pressure.
T	F	9) Continental tropical (cT) air masses are known for being hot and moist.
T	F	10) The Horse Latitudes are located at 60°N and 60°S latitudes and are characterized by strong winds and low surface pressures.
T	F	11) Upper level Divergence is usually above surface level Convergence.

T	F	12) Winds blow nearly parallel on either side of a stationary front.
T	F	13) A plastic bag blowing on the ground is an example of a Microscale Wind.
T	F	14) Heat lightning occurs when lightning happens too far away for thunder to be heard.
T	F	15) I would expect to see cirrus first as a warm front approached my location.
T	F	16) Supercell thunderstorms can produce dangerous hail and tornadoes.
T	F	17) Intra-cloud lightning does from one cloud to another in a different cell.
T	F	18) For lightning, the invisible movement of electrons is called the stepped leader.
T	F	19) An EF3 tornado does more damage than an EF1 tornado.
T	F	20) An Alberta Clipper storm originates in Oklahoma.

Part B: Multiple Choice

Instructions: This section is worth a total of 60 points. Choose the best answer. Each question is worth 2 points. Write the answer on the blank line in front of each question with a CAPITAL letter so it's easy for me to read. If I can't tell the difference between a letter (i.e. a c and an e) I will mark it incorrect.

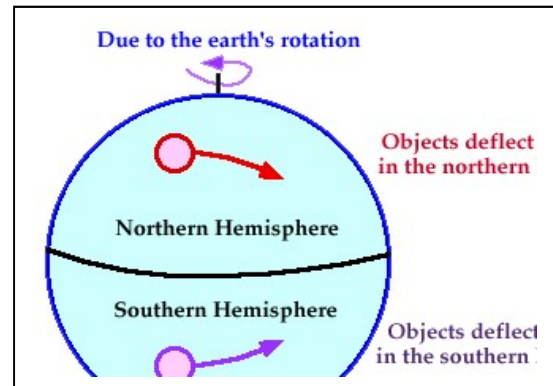
- 21) _____ **The Pressure Gradient Force is responsible for:**
- a) causing wind to flow from Low to High Pressures
 - b) causing the wind to curve to the right in the Northern Hemisphere.
 - c) causing the wind to curve to the right in the Southern Hemisphere
 - d) causing wind to flow from High to Low Pressures
- 22) _____ **In the NORTHERN hemisphere, mid-latitude cyclones rotate:**
- a) Counterclockwise, spiraling in towards the center
 - b) Clockwise, spiraling out from the center
 - c) Counterclockwise, spiraling out from the center
 - d) Clockwise, spiraling in towards the center
- 23) _____ **Which combination of moisture and temperature results in the MOST dense air?**
- a) Cold and Dry
 - b) Warm and Humid
 - c) Cold and Humid
 - d) Warm and Dry
- 24) _____ **Which local wind is associated with the night time surface cooling?**
- a) Country Breezes
 - b) Land Breezes
 - c) Mountain Breezes
 - d) Valley Breezes
- 25) _____ **Based on the wind arrow directions, describe the type of pressure system that is shown in the diagram to the right:**
- a) NH High Pressure
 - b) NH Low Pressure
 - c) SH High Pressure
 - d) SH Low Pressure



- 26) _____ **During which part of the Asian Monsoon is the LOW Pressure located over the warm Indian Ocean?**
- a) During the Autumn Monsoon
 - b) During the Summer Monsoon
 - c) During the Spring Monsoon
 - d) During the Winter Monsoon
- 27) _____ **Which instrument measures pressure over at 24 hour time period?**
- a) Aerovane
 - b) Aneroid Barometer
 - c) Barograph
 - d) Barometer
- 28) _____ **What structure in a severe thunderstorm is a vertical cylinder of rotating air that is around 3-10 kilometers in diameter?**
- a) Overshooting Top
 - b) Anvil
 - c) Mesocyclone
 - d) Wall Cloud
- 29) _____ **A hurricane can be considered an event of what scale?**
- a) microscale
 - b) mesoscale
 - c) macroscale
 - d) both mesoscale and macroscale
- 30) _____ **Episodes of ocean warming produced by weak Trade Winds and a buildup of warm water along the coasts of Ecuador and Peru are referred to as _____ events.**
- a) tropical
 - b) La Niña
 - c) El Niño
 - d) monsoonal
- 31) _____ **Which two local winds occur during the day?**
- a) Land and Sea Breezes
 - b) Valley and Mountain Breezes
 - c) Mountain and Land Breezes
 - d) Sea and Valley Breezes

32) _____ **Which phenomenon is being shown in the diagram to the right:**

- a) Friction
- b) Pressure Gradient Force
- c) Coriolis Effect
- d) Centripetal Force



33) _____ **Which type of front may result from the collision of mT and cT air?**

- a) Warm Front
- b) Dry Line
- c) Cold Front
- d) Occluded Front

34) _____ **A large Pressure Gradient Force would result from which scenario?**

- a) A small change in pressure over a small distance
- b) A large change in pressure over a small distance
- c) A small change in pressure over a large distance
- d) A large change in pressure over a large distance

35) _____ **Occlusion essentially ends a mid-latitude cyclones' life cycle. Why?**

- a) all the cold air is aloft, making the air stable
- b) all the cold air is aloft, making the air unstable
- c) all the warm air below, making the air unstable
- d) all the warm air is aloft, making the air stable

36) _____ **Which is NOT a characteristic of a Cold Front?**

- a) violent precipitation over a small region
- b) travels at 15-20 mph
- c) steep slope
- d) decrease in temperature after its passage

37) _____ **At the surface Friction changes wind direction in what way?**

- a) It causes it to be parallel to the isobars
- b) It causes it to turn back towards the PGF
- c) It causes it to be perpendicular to the isobars
- d) It causes it to turn away from the PGF

- 38) _____ **The prevailing winds for the state of Hawaii are known as:**
- a) The Doldrums
 - b) The Polar Easterlies
 - c) The Westerlies
 - d) The Trade Winds
- 39) _____ **Which statement is true of the polar jet stream?**
- a) It moves closer to the equator during Northern Hemisphere summer.
 - b) The wind speeds are the same along the entire jet.
 - c) The wind speeds are strongest during Northern Hemisphere winter.
 - d) It is different than the mid-latitude jet.
- 40) _____ **Approximately, how far away is a storm if you hear thunder 10 seconds after you see the flash?**
- a) 2/10 mile
 - b) 2 mile
 - c) 20 miles
 - d) 200 miles
- 41) _____ **Winter mid-latitude storms are “steered” in part due to the _____ formed from the differences in temperature between the cold polar easterlies and the warmer westerlies.**
- a) equatorial convergence
 - b) tropical jet stream
 - c) intertropical convergence
 - d) polar jet stream
- 42) _____ **During which stage of a thunderstorm’s life cycle is the storm characterized by ONLY rising air (air going upwards)?**
- a) Stormogenesis Stage
 - b) Cumulus Stage
 - c) Mature Stage
 - d) Dissipating Stage

- 43) _____ **A low pressure system can be considered an event of what scale?**
- a) microscale
 - b) mesoscale
 - c) macroscale
 - d) both microscale and mesoscale
- 44) _____ **The semi-permanent sub-tropical highs are located at what latitudes?**
- a) 0°N and S
 - b) 30°N and S
 - c) 60°N and S
 - d) 90°N and S
- 45) _____ **Which is NOT considered a “criteria” for a storm to be labeled as severe?**
- a) wind speeds greater than 58 mph
 - b) hail greater than 0.75 in in diameter
 - c) a confirmed tornado
 - d) confirmed lightning
- 46) _____ **A La Nina event occurs when:**
- a) the central and eastern Pacific are cooler than normal
 - b) the Indian and Atlantic Ocean are cooler than normal
 - c) the central and eastern Atlantic are cooler than normal
 - d) the central and eastern Pacific are warmer than normal
- 47) _____ **Which type of wind is not warmed by COMPRESSIONAL heating?**
- a) Chinook
 - b) Sea Breeze
 - c) Foehn
 - d) Katabatic
- 48) _____ **Friction only impacts winds within which distance of the surface?**
- a) 1-1.5 km
 - b) 1-2.5 km
 - c) 1-3.5 km
 - d) 1-4.5 km

49) _____ **Which type of front has a steeper slope?**

- a) warm front
- b) cold front
- c) stationary front
- d) dryline

50) _____ **What is it called when a cold front overtakes a warm front?**

- a) a stationary front
- b) a warm-type occluded front
- c) a cold-type occluded front
- d) a warm type stationary front