

PHYSICS DEPARTMENT

MET 1010

Midterm Exam 3

April 17, 2014

Name (print): _____

Signature: _____

*On my honor, I have neither given nor received unauthorized aid on this examination.***YOUR TEST NUMBER IS THE 5-DIGIT NUMBER AT THE TOP OF EACH PAGE.**

- (1) Please print your name and your UF ID number, and sign the top of this page and the back of the answer sheet.
- (2) **Code your test number on your answer sheet (use lines 76–80 on the answer sheet for the 5-digit number).**
- (3) This is a closed book exam and books, calculators or any other materials are NOT allowed during the exam.
- (4) Identify the number of the choice that best completes the statement or answers the question.
- (5) Blacken the circle of your intended answer completely, using a #2 pencil or blue or black ink. Do not make any stray marks or the answer sheet may not read properly.
- (6) Do all scratch work anywhere on this printout that you like. At the end of the test, this exam printout is to be turned in. No credit will be given without both answer sheet and printout.

There are 33 multiple choice questions. All questions are worth 3 points, so the maximum number of points on this test is 99. If more than one answer is marked, no credit will be given for that question, even if one of the marked answers is correct. There is no penalty for wrong answers, so it is better to guess an answer than to leave it blank. Good Luck!

1. A good source region for an air mass would be:

- (1) a generally flat area of uniform composition with light surface winds
- (2) a mountain with deep valleys and strong surface winds
- (3) a hilly area with deep valleys and light winds
- (4) a generally flat area of uniform composition with strong surface winds
- (5) —

2. Lake-effect snows are best developed around the Great Lakes during:

- (1) late fall and early winter when cold, dry polar air moves over the relatively warm water
- (2) early spring when moist, tropical air moves over the frozen lakes
- (3) late fall and early winter when moist, polar air sweeps in from the east
- (4) middle winter when an unseasonably warm air mass moves over the cold water
- (5) middle winter when a continental arctic air mass moves over the frozen lakes

3. During the winter, an air mass that moves into coastal sections of Oregon and Washington from the northwest would most likely be:

- (1) mP (2) mT (3) cP (4) cT (5) cA

4. What type of air mass would be responsible for daily afternoon thunderstorms along the Gulf Coast?

- (1) mT (2) mP (3) cP (4) cT (5) cA

5. The atmosphere is most unstable when the dominant air mass is _____ .

- (1) mT (2) mP (3) cA (4) cT (5) cP

6. Occluded fronts may form as:

- (1) a cold front overtakes a warm front
- (2) a warm front overtakes a cold front
- (3) a stationary front overtakes a cold front
- (4) a stationary front overtakes a warm front
- (5) a stationary front overtakes another stationary front

7. When comparing an “average” cold front to an “average” warm front which of the following statements is NOT correct.
- (1) the slope of the warm front is steeper
 - (2) near a cold front the changes in the weather occur more abruptly
 - (3) cold fronts move faster than warm fronts
 - (4) severe storms more often form along cold fronts
 - (5) on a weather map, cold fronts are blue and warm fronts are red
8. What type of weather front would be responsible for the following weather forecast: “Increasing cloudiness and warm today with the possibility of showers by this evening. Turning much colder tonight. Winds southwesterly becoming gusty and shifting to northwesterly by tonight.”
- (1) cold front
 - (2) warm front
 - (3) warm-type occluded front
 - (4) stationary front
 - (5) —
9. In the Southern Hemisphere the Middle Latitude Cyclones form around _____ pressure centers and the wind is blowing _____ .
- (1) low; clockwise
 - (2) low; counterclockwise
 - (3) high; clockwise
 - (4) high; counterclockwise
 - (5) high; north
10. If the flow of air into a surface low pressure area is greater than the divergence of air aloft, the surface pressure in the center of the low will _____ and the storm itself will _____ :
- (1) increase, weaken
 - (2) decrease, strengthen
 - (3) decrease, weaken
 - (4) increase, strengthen
 - (5) —
11. The development or strengthening of a middle latitude storm system is called:
- (1) cyclogenesis
 - (2) convergence
 - (3) divergence
 - (4) frontolysis
 - (5) —
12. When an upper-level low lies directly above a surface low:
- (1) the surface low will probably weaken
 - (2) thunderstorms will develop
 - (3) a wave cyclone will begin to form
 - (4) the pressure of the surface low will decrease
 - (5) cyclogenesis will occur
13. A weather warning indicates that:
- (1) hazardous weather is either imminent or occurring within the forecast area
 - (2) the atmospheric conditions are favorable for hazardous weather over a particular region
 - (3) hazardous weather is likely to occur within the forecast area during the next 24 hours
 - (4) hazardous weather is frequently observed in a particular region
 - (5) —
14. The Middle Latitude Cyclones originate along
- (1) the polar front
 - (2) the subtropical highs
 - (3) the ITCZ
 - (4) cold fronts
 - (5) warm fronts
15. A forecast method that compares past weather maps and weather patterns to those of the present is:
- (1) the analogue method
 - (2) persistence forecasting
 - (3) the trend method
 - (4) nowcasting
 - (5) —

16. In terms of weather prediction the term “sounding” is used to specify

- (1) measurements of atmospheric conditions at several different altitudes at a given location.
- (2) the sound that the wind makes at a given temperature.
- (3) a record of atmospheric conditions at the ground for the last 24 hours.
- (4) a forecasting method that uses the speed of sound.
- (5) satellite observations of the water vapor content of the atmosphere.

17. Ordinary thunderstorms only last about one hour and begin to dissipate:

- (1) when the downdraft spreads throughout the cloud and cuts off the updraft
- (2) when lightning neutralizes all the electrical charge in the cloud
- (3) when all the precipitation particles in the cloud turn to ice
- (4) when solar heating at the ground begins to increase
- (5) once the sun sets below the horizon

18. Severe thunderstorms are capable of producing:

- (1) any of these (2) large hail (3) tornadoes (4) flash floods (5) —

19. The greatest annual number of thunderstorms in the United States occurs in:

- (1) Florida (2) the Pacific Northwest (3) the Central Plains (4) the desert southwest (5) Texas

20. The so-called “Tornado Belt” of the United States is located:

- (1) in the Central Plains
- (2) in Florida
- (3) in the desert southwest
- (4) in the middle Atlantic states
- (5) along the Gulf Coast

21. The pressure gradient force in a tornado points:

- (1) toward the center of the tornado.
- (2) away from the center of the tornado.
- (3) along the isobars.
- (4) toward higher pressure.
- (5) down.

22. Ordinary thunderstorms most often occur _____ because the _____ .

- (1) in the afternoon; atmosphere is most unstable
- (2) in the morning; atmosphere is most stable
- (3) in the morning; relative humidity is the highest
- (4) in the afternoon; atmosphere is most stable
- (5) when a cold front passes; cold air pushes the warm air up

23. The vertical structure of the hurricane shows an upper-level _____ of air, and a surface _____ of air.

- (1) outflow, inflow (2) outflow, outflow (3) inflow, outflow (4) inflow, inflow (5) —

24. In the Northern Hemisphere, hurricanes and middle latitude cyclones are similar in that both:

- (1) have winds that blow counterclockwise around their centers
- (2) have surface weather fronts
- (3) intensify as they move north of the tropics
- (4) will generally move from west to east
- (5) —

25. Order the Tropical Cyclones (TC), Mid-latitude Cyclones (MLC) and the Tornadoes (T), according to the magnitude (strength) of the pressure gradient force from largest (strongest) to smallest (weakest).

- (1) T, TC, MLC (2) TC, T, MLC (3) MLC, T, TC (4) MLC, TC, T (5) TC, MLC, T

26. The main source of energy for a hurricane is the:

- (1) warm ocean water and release of latent heat of condensation
- (2) upper-level jet stream
- (3) rising of warm air and sinking of cold air in the vicinity of weather fronts
- (4) ocean currents and tides
- (5) solar energy

27. Hurricanes do not develop at the equator because at the equator:

- (1) the Coriolis force is zero.
- (2) the surface water temperature is too high.
- (3) the surface winds are converging.
- (4) the surface pressure is low.
- (5) —

28. The surface winds in a hurricane are strongest:

- (1) in the eyewall. (2) in the eye of the hurricane. (3) in the rain bands. (4) outside of the hurricane. (5) —

29. When a friend asks you, “How is the weather going to be on my wedding in a month from now?” your best answer would be based on a _____ forecast.

- (1) climatological (2) persistent (3) steady-state (4) random (5) —

30. The diagram shows the current surface weather conditions. What is the most appropriate forecasting method to correctly predict the weather in Gainesville tomorrow?

- (1) steady-state forecast
- (2) persistence forecast
- (3) climatological forecast
- (4) weather outlook
- (5) probability forecast



31. Squall-line thunderstorms form _____ .

- (1) in advance or along a cold front
- (2) behind a cold front
- (3) in advance or along a warm front
- (4) behind a warm front
- (5) behind an occluded front

32. In cloud-to-ground lightning, the stepped leader travels _____ and the return stroke travels _____ .

- (1) downward, upward
- (2) upward, upward
- (3) upward, downward
- (4) downward, downward
- (5) —

33. In the winter, what is the most likely precipitation sequence to be seen when a warm front passes:

- (1) snow, sleet, freezing rain, rain, drizzle
- (2) drizzle, rain, freezing rain, sleet, snow
- (3) freezing rain, rain, snow, drizzle, sleet
- (4) drizzle, snow, rain, freezing rain, sleet
- (5) sleet, snow, freezing rain, rain, drizzle