

PHYSICS DEPARTMENT

MET 1010

Midterm Exam 3

April 16, 2008

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, each of which is worth 3 points. In addition there is a bonus question (marked) worth 1 extra (bonus) point which you will get simply for answering the bonus question. Therefore the maximum number of points on this exam is 100. 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!

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1. If today's temperature in Gainesville is the lowest on record for that particular day (April 16), which of these forecasts is guaranteed to have been wrong?
 - (1) climatological forecast (2) analogue forecast (3) persistent forecast (4) — (5) steady state forecast

 2. A weather watch would probably be issued for which of the following conditions?
 - (1) a tornado has been sighted at the outskirts of town
 - (2) there is a chance for tornadoes tomorrow
 - (3) —
 - (4) presently, extremely high winds are occurring at mountain summits
 - (5) heavy snow has been falling over the forecast area

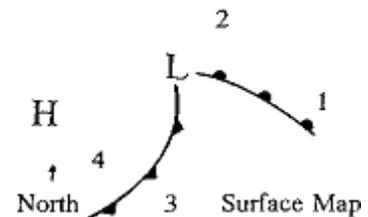
 3. The Fujita scale pertains to:
 - (1) the devastation impact of an earthquake
 - (2) the amount of hail that falls from a mature thunderstorm
 - (3) the strength of a hurricane
 - (4) the strength of a tornado
 - (5) the size of the thunderstorm image on a radar screen

 4. Suppose the eye of a hurricane passed directly over you, and you survived the experience. If winds were from the northeast as the eyewall first approached you, from what direction did the winds blow when the eyewall reached you the second time?
 - (1) — (2) SE (3) NE (4) NW (5) SW

 5. In a hurricane, the eye wall represents:
 - (1) a layer of cirrus cloud in the center of the storm
 - (2) a region of light winds and low pressure
 - (3) the exact center of the storm
 - (4) the area of broken cloudiness at the center
 - (5) a zone of intense thunderstorms around the center

6. The upper part of a thunderstorm cloud is normally _____ charged, and the middle and lower parts are _____ charged.
 (1) positively, positively (2) negatively, negatively (3) — (4) negatively, positively (5) positively, negatively
7. The conditions for a development of a middle latitude cyclone are favorable when a low pressure center at the surface is aligned with _____ .
 (1) a divergence of the air aloft
 (2) a center of low pressure aloft
 (3) a convergence of the air aloft
 (4) —
 (5) a center of high pressure aloft
8. In an exceptionally cold winter during which the Great Lakes were entirely covered by ice, lake effect snows would be expected in extremely high frequency and intensity.
 (1) — (2) — (3) — (4) true (5) false
9. The greatest annual number of thunderstorms in the United States occurs in:
 (1) Florida (2) Texas (3) the Ohio valley (4) the Central Plains (5) the desert southwest
10. (This is a bonus question worth one extra point. In order to claim the extra point, you need to select one and only one of the following answers. Please choose the answer which best describes your situation. This question is simply an informal opinion poll regarding the quality of the textbook and the usefulness of the online learning companion.) This semester
 (1) I used an old edition of the textbook but in hindsight I wish I had purchased the new edition.
 (2) I had the new edition of the textbook and I also tried the MeteorologyNow web-based learning companion, which I found very useful in preparing for the tests.
 (3) I used an old edition of the textbook and was happy with it.
 (4) I had the new edition of the textbook and I also tried the MeteorologyNow web-based learning companion that came with it. I did not find the latter particularly useful.
 (5) I had the new edition of the textbook but I never used the MeteorologyNow web-based learning companion, either because the textbook didn't come with it, or because I didn't feel any need for it.

11. This and the following questions refer to the surface weather map at right.
 Clearing skies are most likely at position



- (1) 4. (2) 1. (3) 3. (4) — (5) 2.
12. Refer to the above question. Falling pressure would probably be observed at
 (1) 1, 2, 3, and 4. (2) 1 and 2. (3) — (4) 1. (5) 1, 2, and 3.
13. Refer to the above question. Which position is located in the warm sector?
 (1) 1 (2) 4 (3) 3 (4) 2 (5) —

14. This forecast provides an overview of how temperature and precipitation patterns may compare with normal conditions.
- (1) extended forecast (2) normal forecast (3) ensemble forecast (4) climatological forecast (5) outlook
15. Which of the following is presently a problem with modern-day weather predictions?
- (1) there are regions of the world where only limited data is available
(2) all of these
(3) the results from the models are very sensitive to the initial conditions
(4) the models are too simple and do not account for all relevant factors
(5) the distance between grid points on some models is too large to pick up smaller-scale weather features such as thunderstorms
16. The signal detected by a Doppler radar is:
- (1) a radiowave emitted by lightning
(2) a soundwave produced by atmospheric turbulence
(3) a radiowave reflected by precipitation
(4) a soundwave produced by thunder
(5) a Doppler wave emitted from the clouds
17. The surface winds in a hurricane rotate in a clockwise direction:
- (1) in the Northern Hemisphere only
(2) —
(3) in neither hemisphere
(4) in the Southern Hemisphere only
(5) in both the Northern and Southern Hemispheres
18. Which forecasting method assumes that weather systems will move in the same direction and at the same speed as they have been moving?
- (1) weather type forecast (2) persistence forecast (3) climatological forecast (4) steady state (trend) forecast
(5) probability forecast
19. What type of air mass would be responsible for persistent cold, damp weather with drizzle along the east coast of North America?
- (1) mT (2) cP (3) cA (4) cT (5) mP
20. Which below is not an atmospheric condition conducive to the formation of hurricanes?
- (1) moist, humid surface air
(2) strong upper-level winds
(3) a region of converging surface winds at the surface
(4) cold air aloft
(5) warm water
21. If you wanted to make a persistence forecast of minimum and maximum temperatures for tomorrow, which of today's charts would be most helpful?
- (1) pressure tendency chart (2) meteogram (3) Doppler radar display (4) sounding (5) 500 mb chart

22. The air mass with the highest actual water vapor content is:
- (1) cP (2) cA (3) cT (4) mP (5) mT
23. Suppose it is sunny and warm outside. A cold front is moving toward your location, bringing a line of thunderstorms associated with the front. Still further behind the front the weather is cold and clearing. If the front is scheduled to pass your area in 6 hours, a persistence forecast for your area for 12 hours from now would be:
- (1) cold and clearing
 (2) cold and raining
 (3) this is a trick question: there is not enough information on which to base a persistent forecast
 (4) sunny and warm
 (5) a thunderstorm
24. Which of the following is not associated with rising air motions?
- (1) convergence of air at the surface (2) convergence of air aloft (3) overrunning (4) — (5) divergence of air aloft
25. A second surge of negatively charged particles that proceeds from the base of a cloud toward the ground during cloud-to-ground lightning is called a:
- (1) downstroke (2) dart leader (3) return stroke (4) subsequent stroke (5) stepped leader
26. The word “frontogenesis” on a weather map would mean that:
- (1) a front is in the process of dissipating
 (2) severe thunderstorms will form along a front
 (3) one front is about to overtake another front
 (4) —
 (5) a front is regenerating or strengthening
27. Thunder will not occur:
- (1) without lightning
 (2) in thunderstorms over the ocean
 (3) in wintertime thunderstorms
 (4) when a thunderstorm is not producing precipitation
 (5) at night

28. Front A in the figure is a Southern Hemisphere _____ front and is moving toward the _____ .



- (1) cold, north (2) warm, south (3) cold, south (4) warm, north (5) none of these
29. For a forecast to show skill it must:
- (1) be accurate for over more than 90% of the forecast area
 (2) be better than the forecast shown on the Weather Channel
 (3) be better than the forecast predicted by a computer
 (4) be better than one based on persistence or climatology
 (5) be accurate to within 2°C of the predicted temperature

30. The first three stages of a developing hurricane are (from first stage to third stage):

- (1) cyclone, typhoon, tropical storm
- (2) tropical depression, tropical disturbance, tropical storm
- (3) tropical storm, tropical depression, typhoon
- (4) tropical disturbance, tropical storm, typhoon
- (5) tropical disturbance, tropical depression, tropical storm

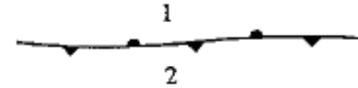
31. Which of the following is true?

- (1) hurricanes are only given male names
- (2) Atlantic hurricanes are given male names and Pacific hurricanes are given female names
- (3) Atlantic hurricanes are given female names and Pacific hurricanes are given male names
- (4) hurricanes are alternately assigned male and female names
- (5) hurricanes are only given female names

32. The coldest of all air masses is:

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

33. The front shown in the figure is _____ front. The air temperature at point 1 is _____ the air temperature at point 2.



- (1) a stationary, higher than
- (2) an occluded, lower than
- (3) a stationary, lower than
- (4) an occluded, higher than
- (5) an occluded, the same as

34. Downdrafts spread throughout a thunderstorm during the _____ stage.

- (1) cumulus
- (2) precipitating
- (3) developing
- (4) dissipating
- (5) —