

PHYSICS DEPARTMENT

MET 1010

Midterm Exam 1

February 13, 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. 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. Most of the radiation emitted by a human body is in the form of:
 - (1) visible radiation but is too faint to be detected by the eye
 - (2) infrared radiation and is invisible to the eye
 - (3) humans do not emit electromagnetic radiation
 - (4) ultraviolet radiation and is invisible to the eye
 - (5) —

2. If the air temperature increased, with no addition or removal of water vapor, the actual vapor pressure would _____ and the saturation vapor pressure would _____.
 - (1) decrease, increase
 - (2) increase, decrease
 - (3) stay the same, stay the same
 - (4) stay the same, increase
 - (5) decrease, stay the same

3. Clouds in the tropics tend to move from east to west. Consequently, which rhyme best describes a rainbow seen in the tropics?
 - (1) —
 - (2) rainbow at the break of dawn, means, of course, the rain is gone
 - (3) rainbow at the break of day, means that the rain is on the way
 - (4) rainbow in the morning, means that sailors should take warning
 - (5) rainbow with a setting sun, means that sailors can have some fun

4. The temperature inversion in the stratosphere is due to which warming process:
 - (1) the greenhouse effect
 - (2) absorption of ultraviolet solar radiation by ozone
 - (3) chemical reactions between ozone and chlorofluorocarbons
 - (4) release of latent heat energy during the condensation of water vapor
 - (5) burning of falling meteorites due to frictional heating

5. For frozen dew to form:

- (1) at some point the minimum temperature must fall to freezing or below
- (2) —
- (3) dew must form first and then freeze
- (4) the initial dew point must be above freezing
- (5) all of these

6. For maximum winter warmth, in the Southern Hemisphere, large windows in a house should face:

- (1) —
- (2) north
- (3) west
- (4) east
- (5) south

7. A wet-looking road surface on a clear, hot, dry day is an example of:

- (1) an inferior mirage
- (2) reflection of light
- (3) a superior mirage
- (4) light scattering
- (5) condensation

8. Which of the following will decrease in a rising parcel of air?

- (1) all of these
- (2) specific humidity
- (3) —
- (4) mixing ratio
- (5) absolute humidity

9. The outpouring of gases from the earth's hot interior is called:

- (1) a lapse rate
- (2) the hydrologic cycle
- (3) the greenhouse effect
- (4) outgassing
- (5) evaporation

10. In a temperature inversion:

- (1) it is warmer at night than during the day
- (2) air temperature decreases with increasing height
- (3) air temperature remains constant with increasing height
- (4) air temperature increases with increasing height
- (5) the air temperature increases at night and decreases during the day

11. In most areas the warmest time of the day about 5 feet above the ground occurs:

- (1) in the afternoon between 2 and 5 pm
- (2) in the early evening after 6 pm
- (3) just after the sun sets
- (4) just before the sun sets
- (5) around noon

12. Cirrus clouds are composed primarily of:

- (1) ice particles
- (2) water vapor
- (3) ozone
- (4) aerosols
- (5) water droplets

13. The blueness of the sky is mainly due to:

- (1) emission of blue light by the atmosphere
- (2) the presence of dust particles in the atmosphere
- (3) the presence of water vapor in the atmosphere
- (4) the scattering of sunlight by air molecules
- (5) absorption of blue light by the air

14. On the average, as a cloud grows thicker (taller),
- (1) all of these
 - (2) less sunlight is transmitted through the cloud
 - (3) more sunlight is absorbed by the cloud
 - (4) more sunlight is scattered by the cloud
 - (5) more sunlight is reflected by the cloud
15. The greatest variation in daily temperature usually occurs:
- (1) at the top of a high-rise apartment complex
 - (2) at the level where thermals stop rising
 - (3) at the ground
 - (4) about 5 feet above the ground
 - (5) underground
16. Which statement relates to weather rather than climate?
- (1) Outside it is cloudy and snowing
 - (2) The foggiest month of the year is December
 - (3) I like the hot, humid summers in Gainesville
 - (4) The average temperature for the month of January is 45°F
 - (5) The lowest temperature ever recorded in Frozenlake, Minnesota is -57°F
17. Without the atmospheric greenhouse effect, the average surface temperature would be:
- (1) the same as it is now (2) the absolute zero (3) higher than at present (4) — (5) lower than at present
18. The most abundant greenhouse gas in the earth's atmosphere:
- (1) methane (CH₄) (2) nitrogen (N₂) (3) water vapor (H₂O) (4) argon (Ar) (5) chlorofluorocarbons (CFCs)
19. Radiation fog forms best on a:
- (1) cloudy summer night with a slight breeze
 - (2) clear summer night with a strong breeze
 - (3) cloudy winter night with a strong breeze
 - (4) clear winter night with a slight breeze
 - (5) cloudy winter night with a slight breeze
20. The electrified region of the upper atmosphere is called the:
- (1) stratosphere (2) thermosphere (3) ionosphere (4) mesosphere (5) troposphere
21. At what time of day is the relative humidity normally at a minimum?
- (1) around sunrise
 - (2) about midnight
 - (3) around sunset
 - (4) when the air temperature is highest
 - (5) when the air temperature is lowest

22. Suppose the dew point of cold outside air is the same as the dew point of the warm air indoors. If the door is opened and cold air replaces some of the warm air, then the new relative humidity indoors would be:
- (1) —
 - (2) lower than before
 - (3) impossible to tell from the information given
 - (4) higher than before
 - (5) the same as before
23. Energy of motion is also known as:
- (1) latent heat
 - (2) dynamic energy
 - (3) potential energy
 - (4) kinetic energy
 - (5) work
24. Suppose yesterday morning you noticed ice crystals (frost) on the grass, yet the minimum temperature reported in the newspaper was only 35°F. The most likely reason for this apparent discrepancy is that:
- (1) temperature readings are taken in instrument shelters more than 5 feet above the ground
 - (2) the newspaper reported the wrong temperature
 - (3) the thermometer was read incorrectly
 - (4) the thermometer was in error
 - (5) the thermometer was read before the minimum temperature was reached for that day
25. On a humid day, the _____ causes salty potato chips left outside in an uncovered bowl to turn soggy.
- (1) —
 - (2) attraction of water by hydrophobic condensation nuclei
 - (3) repelling of water by hydrophobic condensation nuclei
 - (4) attraction of water by hygroscopic condensation nuclei
 - (5) repelling of water by hygroscopic condensation nuclei
26. Which association below is not correct?
- (1) stratocumulus – low cloud
 - (2) altostratus – low cloud
 - (3) cirrostratus – high cloud
 - (4) cumulonimbus – cloud of vertical extent
 - (5) altocumulus – middle cloud
27. The most efficient way to heat up the troposphere is by
- (1) conduction of heat
 - (2) scattering of solar radiation by the air molecules
 - (3) absorption of solar radiation by the air molecules
 - (4) volcanic eruptions
 - (5) vertical convection of air
28. Two objects A and B have the same mass but the specific heat of A is larger than the specific heat of B. If both objects absorb equal amounts of energy:
- (1) both A and B will warm up at the same rate
 - (2) both A and B will warm up, with B getting warmer than A
 - (3) B will warm up, and A will cool down
 - (4) both A and B will warm up, with A getting warmer than B
 - (5) A will warm up, and B will cool down

29. With which set of conditions below would you expect wet laundry hanging outdoors on a clothesline to dry most quickly?

	<u>Air Temperature (°F)</u>	<u>Relative Humidity</u>	<u>Wind Speed</u>
(1)	40	50%	10 mph
(2)	60	75%	10 mph
(3)	40	75%	20 mph
(4)	60	75%	20 mph
(5)	60	50%	20 mph

30. The change of state of ice into water vapor is known as:

- (1) sublimation (2) melting (3) condensation (4) crystallization (5) deposition

31. The earth is tilted at an angle of 23.5° with respect to the plane of its orbit around the sun. If the amount of tilt were increased to 40° , we would expect in middle latitudes:

- (1) no appreciable change from present conditions
 (2) cooler summers and colder winters than at present
 (3) cooler summers and milder winters than at present
 (4) hotter summers and milder winters than at present
 (5) hotter summers and colder winters than at present

32. At night, low clouds:

- (1) have no effect on the atmospheric greenhouse effect
 (2) are often caused by the atmospheric greenhouse effect
 (3) —
 (4) weaken the atmospheric greenhouse effect
 (5) enhance the atmospheric greenhouse effect

33. As you move up into the atmosphere, the air density _____ and the atmospheric pressure _____ .

- (1) decreases, increases (2) decreases, decreases (3) — (4) increases, decreases (5) increases, increases