

# METEOROLOGY FINAL EXAM

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## **QUESTION BOOKLET**

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### **SPECIAL INSTRUCTIONS**

- The exam duration is 45 minutes
  - There are 25 multiple choice and 2 bonus questions, each worth 2 marks
  - Please write your name AND mark all answers on the answer sheet
  - To receive credit for bonus questions, you must attempt all 25 exam questions
  - Read each question carefully and select the most correct answer
  - Good Luck!
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- 1) The most important element in the atmosphere from a weather standpoint is
  - a) pressure
  - b) the atmospheric capacity for expansion
  - c) water vapor
  - d) oxygen
  
- 2) A front is
  - a) a narrow transition zone between a cyclone and an anticyclone
  - b) a line of thunderstorms
  - c) a narrow transition zone between two air masses
  - d) a mass of stratoform cloud that becomes progressively unstable
  
- 3) The clouds which appear, in sequence, in advance of an approaching warm front are
  - a) cirrus, cirrostratus, altostratus, nimbostratus and stratus
  - b) cumulus, cumulonimbus, nimbostratus and stratus
  - c) cirrus, cumulonimbus, nimbostratus and stratus
  - d) altostratus, cumulus, cumulonimbus, nimbostratus and stratus
  
- 4) The cloud and precipitation that often develop at a cold front are caused by
  - a) cold air climbing over the warm air
  - b) cold air being heated as it moves over the warm ground
  - c) warm air expanding as it is lifted by the advancing cold air
  - d) convergence

- 5) An air mass may be defined as a large section of the \_\_\_\_\_ with uniform properties of \_\_\_\_\_ and \_\_\_\_\_ in the horizontal. The missing words are
- stratosphere, temperature, pressure
  - tropopause, stability, pressure
  - atmosphere, stability, moisture
  - troposphere, temperature, moisture
- 6) Air masses which are being cooled from below are characterized by
- strong winds, cumulus cloud, good visibility
  - uniform temperature, good visibility
  - decreasing humidity, poor visibility
  - fog, poor visibility and layer-type clouds
- 7) Wind is caused by
- the rotation of the earth
  - friction between the air and the ground
  - horizontal pressure differences
  - the movements of fronts
- 8) Which phenomenon is responsible for explaining why surface wind velocities are stronger during the day than at night?
- Surface friction
  - Diurnal variation
  - Coriolis force
  - Divergence
- 9) A pilot would expect the winds to back and decrease when
- the lapse rate is steep
  - a low pressure system is approaching the airport
  - descending towards an airport
  - departing an airport
- 10) Land breezes
- occur during the day and blow onto the shore
  - occur during the night and blow onto the ocean
  - occur during the night and blow onto the shore
  - occur during the day and blow onto the ocean

- 11) A sudden violent change in wind speed or direction that can impose severe penalties on an airplane's performance is called
- a) wind tip vortices
  - b) wind shear
  - c) diurnal variation
  - d) clean air turbulence
- 12) The amount of water vapor that a given volume of air can contain at a given pressure is governed by
- a) the temperature
  - b) the stability
  - c) the relative humidity
  - d) the lapse rate
- 13) A horizontal layer of cloud in the lower layers of the atmosphere from which continuous precipitation falls is called
- a) cirrostratus
  - b) altostratus
  - c) nimbostratus
  - d) cumulonimbus
- 14) In order for clouds to form in the atmosphere, relative humidity must be \_\_\_\_, there must be \_\_\_\_ of the air and \_\_\_\_ must be present. The missing words are
- a) low, cooling, coalescence
  - b) high, cooling, condensation nuclei
  - c) high, heating, condensation nuclei
  - d) low, heating, coalescence
- 15) A low pressure area is
- a) also called an anticyclone
  - b) a region of relatively low pressure with highest pressure at the center
  - c) a region of relatively low pressure with the lowest pressure at the center
  - d) a region in which the wind blows clockwise
- 16) Which atmospheric phenomenon is responsible for deflecting air to the right in the northern hemisphere?
- a) Surface friction
  - b) Diurnal variation
  - c) Coriolis force
  - d) Divergence

- 17) A steep pressure gradient indicates
- a) heavy precipitation
  - b) light winds
  - c) strong winds
  - d) rising pressure
- 18) Buys Ballot's Law states that
- a) if the pressure is falling, unsettled weather will follow
  - b) if you stand with your back to the wind, the low pressure system will be off your left side
  - c) if warm air is rapidly cooled by undercutting cold air, unsettled weather will follow
  - d) if you are descending towards an airport, the winds will generally back and decrease in velocity
- 19) The ICAO standard atmospheric pressure is
- a) 29.92 dcm
  - b) 29.92 hPa
  - c) 29.92 "Hg
  - d) 29.92 kPa
- 20) Select the correct statement from the following:
- a) Vertical currents develop readily in stable air
  - b) A shallow lapse rate indicates stable air
  - c) An isothermal layer is associated with unstable air
  - d) Relative visibility is always poor in unstable air
- 21) The lapse rate is the rate of change of
- a) temperature with height
  - b) pressure with height
  - c) pressure in the horizontal
  - d) temperature in the horizontal
- 22) The dry adiabatic lapse rate is
- a) 1.50C / 1,000 feet
  - b) 1.98C / 1,000 feet
  - c) 2.00C / 1,000 feet
  - d) 3.00C / 1,000 feet

- 23) Fog that forms on clear nights with light winds is known as
- a) advection fog
  - b) steam fog
  - c) upslope fog
  - d) radiation fog

Questions 24 - 25 refer to the weather publication below:

METAR CYWG 100800Z 19002KT 10SM OVC044 FEW005 02/M07  
A3001 RMK AC3 SLP201=

- 24) Select the false statement.
- a) This METAR was issued on the 1st day (of the month) at 0800Z
  - b) The altimeter setting is 30.01 inches of mercury
  - c) There is an overcast layer of cloud at 4,400 feet AGL
  - d) The above weather publication is a weather “snapshot” at CYWG
- 25) Select the correct statement.
- a) The spread is 7C
  - b) The reported winds are strong
  - c) The dew point is 2C
  - d) The sea level pressure is 1020.1 hPa

## **BONUS QUESTIONS**

- 26) When flying through a layer of nimbostratus clouds, you encounter sudden and severe turbulence. The most probable cause is
- a) embedded towering cumulus or cumulonimbus clouds
  - b) embedded altocumulus clouds
  - c) embedded stratocumulus clouds
  - d) embedded cirrocumulus clouds
- 27) An aircraft is flying at 10,000 feet ASL on a track of 279 degrees. In order to maintain this track, the pilot is holding a heading of 304 degrees. An area of low pressure exists
- a) to the right of track
  - b) to the left of track
  - c) behind the airplane
  - d) ahead the airplane

**END OF EXAM**