

## **MET 101 Final Exam Study Guide**

### **Geography Basics**

- 1) Are the number of miles between each degree of longitude constant?
- 2) Along which longitude the 'International Date Line' is located?
- 3) Number of arc minutes in each degree of latitude?
- 4) How many degrees does the Earth rotate in an hour?
- 5) Latitude/Longitude coordinates for Long Island
- 6) On Long Island, which wind brings the warmest, moistest weather
- 7) On Long Island, which wind brings the coldest, driest weather

### **Chapter 1**

- 8) Two gases that compose most of the Earth's atmosphere
- 9) Atmospheric layer where 'ozone maximum' is located
- 10) Relative locations of Earth's atmospheric layers from the surface all the way to the top of the atmosphere
- 11) Ozone's purpose in the upper atmosphere for us here on Earth
- 12) Temperature trend with increasing height in troposphere
- 13) Chemical symbol for ozone

### **Chapter 2**

- 14) Latitude the Sun appears directly overhead during Northern Hemisphere summer solstice
- 15) Season when the Northern Hemisphere is tilted away/toward the Sun in the Northern Hemisphere
- 16) How many degrees is Earth's axis is tilted

### **Chapter 3**

- 17) 'Greenhouse Effect'

### **Chapter 4**

- 18) What is the main cause of 'Coriolis Force'
- 19) Cause of atmospheric pressure
- 20) Whether air rises/sinks in high/low pressure

- 21) Isobar spacing and wind speed
- 22) Wind direction around high and low pressure in Northern Hemisphere (in terms of 'clockwise' and 'counterclockwise')
- 23) Direction of Pressure Gradient Force in Northern/Southern Hemisphere
- 24) Direction air is deflected ('right' or 'left') due to Coriolis Force in Northern/Southern Hemisphere
- 25) Whether air converges/diverges at the center of a high/low pressure
- 26) Pressure trend as one moves from Earth's surface
- 27) Flow of air between high and low pressure in the Northern Hemisphere

#### Chapter 5

- 28) Adiabatic processes in rising/sinking air parcels [With regard to temperature change and parcel size]
- 29) Adiabatic process a parcel goes through to form a cloud
- 30) When is dew most likely to form (In terms of wind and sky conditions)
- 31) Definition of 'advection fog' in terms of set-ups
- 32) Whether dew point temperature can exceed air temperature

#### Chapter 6

- 33) Name of clouds that produce light, gentle rains
- 34) Characteristics of cirrus clouds (Composition, location, 'mare's tails')
- 35) Definition of 'snowflake'

#### Chapter 7

- 36) Whether the Bergeron/Collision-coalescence process can produce rain/snow?
- 37) Definition of 'supercooled' liquid droplet
- 38) Temperature profile within a cumulonimbus cloud during hail storm

#### Chapter 8

- 39) What causes deserts?

#### Chapter 9

- 40) Cloud type progression as a warm front approaches an observer
- 41) Two variables most indicative of a strong frontal passage

42) What is the name of the front where air is lifted ‘violently’?

Chapter 10

43) Given a map with fronts and isobars, determine type of air mass, origins and where precipitation is occurring

44) Where are weather fronts found? (Think of thermal boundaries)

45) How atmospheric variables change due to cold frontal passage in Northern Hemisphere

Chapter 11

46) Determine stage of air mass thunderstorm given diagram (cumulus, mature and dissipation)

47) Favorable set up for thunderstorm formation (i.e. what constitutes an unstable atmosphere?)

48) Definition of ‘wind shear’

49) Type of cloud that forms during ‘cumulus’ phase of thunderstorm development

50) Why surface temperatures decrease during a thunderstorm

51) State with the highest number of thunderstorm days per year

52) Shape of tornadoes that are most violent

53) Initial (first) step in tornado formation

54) Nation with most tornadoes in the world

55) Reasons the United States has a high number of tornadoes?

56) Definition of ‘wall cloud’

57) Stage in thunderstorm development (mature, cumulus, or dissipative) when rain begins; stage when it is the strongest

58) What happens in a thunderstorm in the area of heaviest rainfall? Is it a downdraft or updraft?

59) When a parcel of air is colder than the surrounding atmosphere, what happens to it? [Think of hot air balloon]

Chapter 12

60) Country with most fatalities due to tropical cyclones in the last fifty years

61) Why hurricanes form only in tropics?

62) Conditions found in ‘eye’ and ‘eye wall’ (In terms of wind and sky conditions)

- 63) Minimum sea surface temperature for hurricane formation
- 64) Why hurricanes do not affect the California coastline
- 65) Main causative factor of storm surges
- 66) Quadrant hurricane winds are strongest
- 67) Where most tropical cyclones that affect the United States originates
- 68) Prerequisites for hurricane formation
- 69) Why hurricanes weaken after moving inland
- 70) Official weather symbols for ‘tropical depressions’, ‘tropical storms’ and ‘hurricanes’
- 71) What geometric shape severe hurricanes look on satellite
- 72) Numerical value of central pressure found in a strong hurricane
- 73) Steering mechanisms/direction of movement for tropical disturbances/storms/hurricanes
- 74) What is the main purpose of a hurricane
- 75) Atmospheric set-up for well-developed hurricane
- 76) What is the main steering mechanism for hurricanes in Atlantic Ocean?

#### Satellite Tutorial

- 77) Definition of visible, infrared, and water vapor satellite

#### Radar Tutorial

- 78) Limitations of radar detecting precipitation
- 79) Definition of ‘sunburst’
- 80) What is ‘storm relative velocity’ is and how it is used to detect a tornado

#### Miscellaneous

- 81) Freezing point of water (i.e. Does all water freeze at zero degrees Celsius?)
- 82) Definition of ‘desert’
- 83) How cloud cover affects overnight minimum temperatures

100 multiple choice questions [Closed book/Closed notes]

Bring Scantron sheets and two sharpened #2 pencils