The Atmosphere

1. The gas which comprises most of the atmosphere is:
    a. Oxygen
    b. Carbon
    c. Nitrogen
    d. Helium
2. The top three gases in the atmosphere are
    a. Nitrogen, Oxygen, and Carbon Dioxide
    b. Nitrogen, Argon, and Oxygen
    c. Oxygen, Neon, and Argon
    d. Helium, Nitrogen, Carbon Dioxide
3. The _____ is the outermost layer of Earth's atmosphere.
    a. Troposphere
    b. Stratosphere
    c. Exosphere
    d. Thermosphere
4. The layer of the atmosphere where most of the world's weather occurs is:
    a. Stratosphere
    b. Troposphere
    c. Hemisphere
    d. Thermosphere
5. The boundary between the troposphere and stratosphere is called the:
    a. Tropopause
    b. Stratopause
    c. Mesopause
    d. Tempopause
6. The tropopause is highest at the north and south poles. (TRUE, FALSE)

7. It is _____ (easier/harder) to breath on top of Mount Whitney (elevation 14,494 ft/4418 m) than at sea level because there is _____ (less/more) oxygen molecules at the summit.

8. Moist air weighs less than dry air. (TRUE, FALSE)

9. Air pressure is measured with
    a. a barometer.
    b. an altimeter.
    c. a wind vane.
    d. an anemometer.
10. You notice on a barometer that air pressure has been decreasing rapidly. The type of weather that would normally be expected to occur would be:
    a. Fog
    b. Drizzle
    c. Clear skies
    d. Thunderstorms
11. If you feel the heat in the handle of a cooking pot, that heat was transferred to the handle by:
    a. Radiation
    b. Convection
    c. Conduction
12. Heat travels though empty space by:
    a. Evaporation
    b. Conduction
    c. Convection
    d. Radiation
13. A sunburn is caused by which method of heat transfer:
    a. Radiation
    b. Convection
    c. Conduction

14. Light colored objects absorb radiation _____ (faster/slower) and emit radiation _____ (faster/slower) than dark colored objects.

15. At night, temperatures will normally be higher under cloudy skies than under clear skies. (TRUE, FALSE)

16. The hydrologic cycle is:
    a. Evaporation, condensation, precipitation
    b. Convection, conduction, condensation
    c. Rain, sunshine, condensation
17. The process of water changing from a liquid to a gas is called _____.
    a. Condensation
    b. the water cycle
    c. Evaporation
    d. Precipitation
18. The brief cloud that forms when you exhale on a cold winter day was formed because of:
    a. Evaporation
    b. Condensation
    c. Precipitation
    d. Runoff
19. There is more water in the atmosphere than in glaciers & icecaps. (TRUE, FALSE)
20. One inch of rainfall over one square mile is how many gallons of water?
    a. 17,400
    b. 174,000
    c. 1,740,000
    d. 17,400,000
21. The region of the atmosphere that reflects radio signals is the _____.
    a. Ozone
    b. Tropopause
    c. Stratosphere
    d. Ionosphere

The Ocean

1. The typical range of salinity in the oceans basins ranges from _____ grams of dissolved salts in each liter.
    a. 23 to 27
    b. 27 to 33
    c. 33 to 37
    d. 43 to 47
2. Sea water freezes at 28.5^{o}F (-2^{o}C) (TRUE, FALSE)
3. The top layer of the ocean, called the Epipelagic Zone, is also called the _____ zone and extends from the surface to _____ meters deep.
    a. sunlight, 2000
    b. sunlight, 200
    c. sunshine, 200
    d. sunshine, 20
4. On average the _____ is the saltiest body of water on the earth.
    a. Great Salt Lake
    b. Black Sea
    c. Dead Sea
    d. Saltine Sea

5. _____ ocean currents flow _____ the equator along the east coasts of continents and _____ currents flow _____ the equator along the west coasts of continents.
    a. warm, away from, cold, toward
    b. warm, toward, cold, away from
    c. cold, away from, warm, toward
6. This is the uninterrupted distance over which the wind blows without significant change in direction.
    a. Run
    b. Shoal
    c. Lane
    d. Fetch
7. The _____ the ocean wave the _____ it travels.
    a. shorter, faster
    b. longer, slower
    c. longer, faster
8. The tide that occurs when the earth, moon and sun are at right angles to each other is called the...
    a. Ebb tide
    b. Neap tide
    c. Spring tide
    d. Flood tide
9. Called differential heating, sea breezes can develop along the coasts because the _____ (ocean, ground) heat and cools faster than the _____ (ocean, ground).

10. Sea breezes often act just like cold fronts and can produce severe weather. (TRUE, FALSE)

11. Along the coasts at night, as the land cools faster than the ocean, a _____ can develop.
    a. sea breeze
    b. land breeze
    c. Chinook
    d. Santa Ana
12. A common name for the persistent marine layer in Southern California during early summer is _____.
    a. May glaze
    b. Gray days
    c. June gloom
    d. Summer bummer
13. With a marine layer present, temperatures can be in the 80s at sea level while in the 50s and 60s at elevations of 2,000 to 2,500 feet. (TRUE, FALSE)

14. Rip currents are powerful, channeled currents of water flowing...
    a. away from shore.
    b. toward shore.
    c. parallel to shore.
    d. parallel to the wind.
15. The vertical motions of rip currents pull people under the water. (TRUE, FALSE)

16. Which is a sure sign that a rip current is underway?
    a. Channel of churning, choppy water
    b. Line of foam, seaweed, or debris moving steadily seaward
    c. Area having a notable difference in water color
    d. Break in the incoming wave pattern
    e. All above or none may be visible
17. If caught in a rip current remain calm. You will not be pulled under the surface of the water. Only swim _____ to escape the current.
    a. in the same direction of the current
    b. directly against the rip current
    c. parallel to the shore
18. About _____ of an iceberg is visible. The rest is under water.
    a. $1/4^{th}$
    b. $1/6^{th}$
    c. $1/8^{th}$
    d. 10^{th}

19. Icebergs in the _____ (Arctic / Antarctic) regions are typically high and narrow. Icebergs in the _____ (Arctic / Antarctic) regions are typically large, flat-topped chunks of ice.

20. Of the world's oceans, which is *second* largest?
    a. Pacific Ocean
    b. Atlantic Ocean
    c. Indian Ocean
    d. Arctic Ocean

Global Weather (Optional)

1. The earth's is tilted on it's axis approximately:
    a. 21.5°
    b. 23.5°
    c. 25.3°
    d. 25.5°
2. The date with the shortest amount of daylight in the Southern Hemisphere is:
    a. June 22
    b. March 21
    c. September 23
    d. December 22
3. The two dates on which equal daylight and night time hours occur are:
    a. June 22 / March 21
    b. March 21 / September 23
    c. September 23 / December 22
    d. March 21 / December 22
4. The earth is closest to the sun in the Northern Hemisphere summer. (TRUE, FALSE)

5. Temperatures inside a closed vehicle can reach 140°F-190°F degrees within 30 minutes on a hot, sunny day. (TRUE, FALSE)

6. Usually, fair and dry/hot weather is associated with high pressure around _____ (30°N/S, 50°-60° N/S) latitude with rainy and stormy weather associated with low pressure around _____ (30°N/S, 50°-60° N/S) latitude.

7. The global circulation pattern which dominates the tropics is called the:
    a. Polar cell
    b. Ferrel cell
    c. Brady cell
    d. Hadley cell
8. Jet streams also "follow the sun" in that as the sun's elevation _____ (increases, decreases) each day in the spring, the jet streams shifts by moving _____ (north, south) during the Northern Hemisphere spring.

9. Climates are the average weather conditions usually found in a particular place. (TRUE, FALSE)

10. Exposure to full sunshine can increase heat index values by up to:
    a. 5°F
    b. 8°F
    c. 12°F
    d. 15°F

11. If the relative humidity is _____, the capacity for air to hold water is _____. Therefore, the amount of evaporation is _____ and the heat removed from the body is _____.
    a. low, smaller, lower, more
    b. high, larger, higher, less
    c. high, smaller, lower, less
    d. low, smaller, higher, more
12. If the temperature outside is -5°F and the wind chill temperature is -31°F, then your car's radiator temperature will be -31°F. (TRUE, FALSE)
13. In 1868, the Christmas Day record high temperature of 101°F would have most likely occurred in which city?
    a. New York City, NY
    b. Miami, Florida
    c. Sydney, Australia
    d. Phoenix, AZ
14. Usually, fair and dry/hot weather is associated with _____ pressure, with rainy and stormy weather associated with _____ pressure.
    a. normal / low
    b. high / low
    c. low / high
    d. high / normal
15. Tropical climates always experience…
    a. severe winters
    b. low humidity
    c. warm air
    d. dry summers
16. In dry climates, yearly precipitation…
    a. is less than the rate of evaporation.
    b. greater than the rate of evaporation.
    c. greater than 30 inches.
    d. less than that in polar climates.
17. Which of the following is true?
    a. Climates at high latitudes are very warm.
    b. The Great Lakes cause the climate to be colder.
    c. Places at lower elevations tend to have higher temperatures.
    d. The Rocky Mountains are generally in a moist subtropical mid-latitude climate.
18. Of the follow main Köppen climates, which is not one the six main climate divisions?
    a. Highland
    b. Desert
    c. Tropical
    d. Polar
19. During an equinox, the Sun is directly over what part of the Earth at noon?
    a. Southern Hemisphere
    b. Tropic of Capricorn
    c. Tropic of Cancer
    d. Equator
20. The 10-year average (1997-2006) for heat related deaths in the U.S. is _____ in a typical year.
    a. 92
    b. 123
    c. 145
    d. 170

Synoptic Meteorology

1. Which of the following is not required for precipitation?
    a. condensation nuclei
    b. a source of lift
    c. moisture
    d. southerly winds

2. Sleet and freezing rain are caused by a cold layer of air aloft (TRUE, FALSE)?

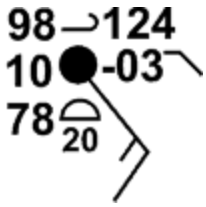
3. Which one of these clouds can produce heavy precipitation?
    a. cumulonimbus
    b. stratocumulus
    c. altostratus
    d. nimbostratus
4. A mid-level cloud deck that has a heap-like appearance would be called?
    a. altostratus
    b. altocumulus
    c. cumulus
    d. stratocumulus
5. A high level cloud that forms in a layer would be called?
    a. cirrus
    b. cirrocumulus
    c. cirrostratus
    d. altostratus
6. Sleet will typically occur to the north of a warm front. (TRUE, FALSE)

7. An east wind means that the air is moving from west to east. (TRUE, FALSE)

8. A west wind means that the air is moving from west to east. (TRUE, FALSE)

9. The force that results from the rotation of the earth is called the _____ force.
    a. pressure gradient
    b. coriolis
    c. frictional
    d. convergence
10. The force that results from roughness of the earth's surface is called the _____ force.
    a. pressure gradient
    b. coriolis
    c. frictional
    d. divergence
11. The force that results from equalizing pressure differences is called the _____ force.
    a. pressure gradient
    b. coriolis
    c. frictional
    d. convergence
12. Air (diverges, converges) near high pressure and (diverges, converges) near low pressure.

Use the station plot, to the right, to answer questions 13 through 16.



13. The temperature at the station is
    a. 78°F
    b. 98°F
    c. 124°F
    d. 78°C
14. The dewpoint at the station is
    a. 78°F
    b. 98°F
    c. 124°F
    d. 78°C
15. The pressure at the station is
    a. 998 mb
    b. 978 mb
    c. 912.4 mb
    d. 1012.4 mb
16. The wind direction and speed is
    a. southeast at 15 kt
    b. northwest at 10 kt
    c. southeast at 20 kt
    d. northwest at 15 kt
17. Which cloud is not a high level cloud?
    a. Cirrocumulus
    b. Cirrostratus
    c. Cirronimbus
    d. Cirrus
18. Which type of clouds is not a low level cloud?
    a. Cumulonimbus
    b. Cumulus
    c. Cirrocumulus
    d. Stratocumulus
19. Which type of cloud begins as a middle layer cloud, but as it develops, the base of the cloud lowers in the low-level clouds.
    a. Altostratus
    b. Stratus
    c. Cirrostratus
    d. Nimbostratus
20. Which type of cloud produces thunderstorms?
    a. Nimbostratus
    b. Cumulonimbus
    c. Nimbocumulus
    d. Altostratus

Thunderstorms

1. Thunderstorms are most common in the:
    a. northwest U.S.
    b. southwest U.S.
    c. southeast U.S.
    d. northeast U.S.
2. Name the three necessary ingredients for thunderstorm formation.
    a. Lifting Mechanism, Fronts, Moisture
    b. Moisture, Lifting Mechanism, Instability
    c. Lifting Mechanism, Mountains, Oceans
    d. Stability, Moisture, Heat

3. An air mass is unstable when cool dry air is near the surface and warm moist air is aloft. (TRUE, FALSE)

4. Where is terrain most likely to be a source of lift for thunderstorm development?
    a. Great Plains
    b. Corn belt
    c. Rocky Mountains
    d. Coastal plain
5. The first stage of a thunderstorm is the...
    a. Cumulus stage
    b. Mature stage
    c. Dissipating stage
6. The most likely stage for large hail and damaging winds is the...
    a. Cumulus stage
    b. Mature stage
    c. Dissipating stage
7. The type of thunderstorm that produces nearly all of the significant tornados is the...
    a. Cluster storm
    b. Squall line
    c. Single cell
    d. Supercell
    e.
8. The clouds in this image (at right) are most representative of what stage in the life of a thunderstorm?

    a. Mature stage
    b. Dissipating stage
    c. Growth stage
    d. Towering Cumulus stage
9. Define wind shear.

10. A SEVERE Thunderstorm is one that produces:
    a. Lightning
    b. Wind gusts to 30 mph and pea size hail
    c. Tornados
    d. Flash floods
11. The #1 killer among thunderstorm hazards is...
    a. Lightning
    b. Tornados
    c. Large hail
    d. Flash flooding
12. The #2 killer among thunderstorm hazards is...
    a. Lightning
    b. Tornados
    c. Large hail
    d. Flash flooding
13. The most destructive weather element is...
    a. Lightning
    b. Tornados
    c. Large hail
    d. Flash flooding
14. Most flash flood deaths occur in homes (TRUE, FALSE)

15. A highway overpass is a good place to take shelter from a tornado (TRUE, FALSE)

16. Which state is not in tornado Alley?
    a. Kansas
    b. North Dakota
    c. Nebraska
    d. Texas

17. How long should you stay in shelter after the last thunder is heard?

a. 10 minutes
b. 20 minutes
c. 30 minutes
d. 60 minutes

18. Where is the safest place to be in a tornado?
    a. basement
    b. interior closet or bathroom
    c. hallway
    d. ditch or ravine
19. Most tornados are spawned by a special kind of thunderstorm called a _____.
    a. supercore
    b. supercell
    c. multicell
    d. multicore
20. About how many tornados strike the U.S. each year?
    a. 800
    b. 1,000
    c. 1,300
    d. 2,000

Lightning

1. How much energy does the AVERAGE lightning bolt carry?
    a. 30 thousand volts/1 million amps
    b. 100 million volts/30,000 amps
    c. 1 thousand volts/30 million amps
    d. 30 million volts/100 thousand
    e. Lightning is too powerful to measure accurately

2. How wide is the average lightning bolt?
    a. About the width of a tire.
    b. About the width of a coffee cup.
    c. About the width of a quarter.
    d. About the width of a pine needle.
    e. About the width of a human hair.

3. Which of the following cities in the United States claims the title "Lightning Capital of the World
    a. Tampa Bay,
    b. Houston, Texas
    c. Atlanta, Georgia
    d. None of the above

4. Which of the following states in the U.S. receives the most lightning strikes on an average annual basis?
    a. Texas
    b. Florida
    c. Oklahoma
    d. New Mexico
    e. Louisiana

5 What are your odds of being struck by lightning?
    a. 1:600,000
    b. 1:750,000
    c. 1:2,000,000
    d. 1:3,000,000
    e. No single answer can be applied to everyone.

6. When a lightning bolt strikes the ground, the next bolt, on average, will...
    a. not strike for another 30 seconds.
    b. go off inside the cloud.
    c. strike within 2 to 3 miles of its predecessor.
    d. All of the above.

7. Thunder...
    a. travels about one mile every 5 seconds, or about one kilometer every 3 seconds.
    b. travels about one mile, or about one and one half kilometers, every second.
    c. can easily be heard from a storm more than 10 miles away.

8. Heat Lightning:
    a. is nothing more than lightning from a storm that is too far away for thunder to be heard.
    b. is a discharge of electromagnetic plasma caused by ionization between the troposphere and the stratosphere.
    c. occurs when differential heating between the stratosphere and the troposphere allows electromagnetic energy to buildup and discharge.
    d. only occurs in Summer.

9. Lightning is the first thunderstorm hazard to arrive, and the last to leave. (TRUE, FALSE)

10. You are planning a large outdoor gathering (e.g. a high school graduation). When should you devise a lightning safety plan?
    a. No lightning plan is necessary...if it strikes, it is an act of God.
    b. The day of the event.
    c. Wait and see if thunderstorms are in the area.
    d. It should be an integral part of the planning stage.
    e. None of the above.

11. What should your lightning safety plan take into account?
    a. The latest weather forecast.
    b. How many people will have to find shelter.
    c. Where they will evacuate to.
    d. All of the above.

12. Which of the following can you depend on to protect you from lightning?
    a. A picnic shelter.
    b. A convertible automobile.
    c. A baseball dugout.
    d. A small cluster of trees.
    e. None of the above

13. You can safely walk outside in a thunderstorm so long as your shoes have rubber soles. (TRUE, FALSE)

14. Which of the following factors will increase your chance of being struck by lightning?
    a. Time of day
    b. Time of year
    c. Geographical location
    d. All of the above.

15. A person who has been struck by lightning...
    a. has very little chance of survival.
    b. should not be touched for at least 60 seconds because his/her electrified body
    c. should be administered CPR if they are unconscious and not breathing.
    d. are affected by both their electrified body and have little chance of survival.

16. You can be struck by lightning even if you are indoors. (TRUE, FALSE)

17. You observe a lightning flash and then hear thunder 10 seconds later. How far away was the lightning bolt.
    a. 2 miles
    b. 3 miles
    c. 5 miles
    d. 10 miles

18. The sound of thunder from a lightning bolt one mile away will typically have a _____ sound.
    a. sharp cracking
    b. soft rumbling
    c. low rumbling
    d. dull booming

19. Using the 30/30 rule for lightning safety, 30 seconds between the flash of lightning and sound of thunder indicates the bolt was _____ miles away.
    a. 3
    b. 6
    c. 30
    d. 60

20. Positively charged lightning strikes are very dangerous as they originate in the _____ portion of the thunderstorm cloud and can strike _____.
    a. lower / tall objects
    b. upper / up to 10 miles away
    c. middle / the upper part of the cloud
    d. downdraft / people on cell phones

Tropical Weather

1. Each square mile in the _____ (tropical/polar) regions receives more energy from the sun than in the _____ (tropical/polar) regions.

2. Like the weather in the United States, the seasons in the tropics have distinct warm and cold periods. (TRUE, FALSE)

3. The Inter-Tropical Convergence Zone exists because of the convergence of the:
    a. fronts
    b. trade winds
    c. downslope winds
    d. hurricane winds
4. For people living near the equator, the rainy season typically occurs:
    a. once
    b. twice
    c. three times
    d. year round
5. Strong tropical cyclones in the western North Pacific Ocean are called:
    a. hurricanes
    b. tropical storms
    c. cyclones
    d. typhoons
6. The "Hurricane Season" for the Atlantic Ocean is:
    a. January 1st through July 31st
    b. June 1st through November 30th
    c. December 1st through February 28th
    d. Year round

7. During El Niño conditions, the occurrences of tropical cyclones are usually _____ (more/less) than in La Niño conditions in the Atlantic Ocean.

8. A tropical storm has wind speeds:
    a. 38 mph or less
    b. from 39 mph to 73 mph
    c. 74 mph or greater
    d. 28 mph to 40 mph
9. A major hurricane is defined as a category:
    a. 2 or higher hurricane
    b. 3 or higher hurricane
    c. 4 or higher hurricane
    d. 5 or higher hurricane
10. El Niño is characterized by:
    a. Large scale, low atmospheric sea level pressures near the equator and cooling of sea surface temperatures in the Eastern Tropical Pacific.
    b. Global warming of the ocean surface and weakening of trade winds in the Eastern and Central Equatorial Pacific.
    c. Large scale weakening of trade winds and warming of sea surface temperatures in the Eastern and Central Equatorial Pacific.
    d. Too many Texans taking abnormally hot showers at the same time.
11. During El Niño, the warmer than normal ocean temperatures in the Eastern and Central Equatorial Pacific Ocean act to:
    a. Produce much drier than normal conditions at subtropical latitudes of North America (Gulf Coast) and South America (southern Brazil to central Argentina).
    b. Produce abnormally dry conditions over northern Australia, Indonesia and the Philippines.
    c. Produce drier than normal conditions over southeastern Africa and northern Brazil, during the northern winter season.
    d. Produce wetter than normal conditions along the west coast of tropical South America.
    e. All of the above.
    f. None of the above.
12. During a La Niña, the water temperature in the Eastern and Central Equatorial Pacific Ocean is lower than normal. (TRUE, FALSE)
13. Which is not a location for the development of tropical cyclones?
    a. North Atlantic Ocean, Gulf of Mexico and the Caribbean Sea
    b. North Indian Ocean including the Bay of Bengal and the Arabian Sea
    c. Northwest Pacific Ocean from the dateline to Asia including the South China Sea
    d. South Atlantic Ocean from Argentina to the Cape of Good Hope

14. The month with the greatest average number of named tropical storms in the Atlantic Oceans is…
    a. August
    b. September
    c. October
    d. July

15. The month with the greatest average number of major hurricanes is…
    a. August
    b. July
    c. October
    d. September

16. The name of the 1-5 scale rating based on a hurricane's intensity is called the _____.
    a. Saffir-Simpson Hurricane Scale
    b. Shaffer-Sampson Hurricane Scale
    c. Simpson-Shafter Hurricane Scale
    d. None of the above.

17. How many named tropical cyclones occurred in the Atlantic Ocean in 2005?
    a. 15
    b. 18
    c. 21
    d. 27

18. ENSO stands for…
    a. El Nino/Southern Oscillation
    b. Eastern/Northern/Southern Oceans
    c. Eastern/Northern/Southern Oscillation
    d. None of the above

19. The warm phase of ENSO is called _____.
    a. La Niña
    b. El Niño
    c. La Que Buena
    d. El Gato

20. During the warm episode of ENSO, the eastern shift in the trough typically sends the storm track, with huge amounts of tropical moisture, into Alaska, north of its normal position of the Pacific Northwest. (TRUE, FALSE)

Doppler Radar

1. Doppler radar emits short bursts of radio waves called
    a. pulses
    b. digits
    c. signals
    d. radar data units (RDU)
2. What additional information aside from reflectivity can the Doppler radar provide?
    a. rotational intensity
    b. radial velocity
    c. relational vorticity
3. A collection of preset elevation slices that the radar sweeps through is called a(n)
    a. elevation coverage product (ECP)
    b. vacuum continuity product (VCP)
    c. volume coverage pattern (VCP)
    d. elevation coverage pattern (ECP)
4. Once the radar has swept through all of the preset elevation angles a _____ is completed.
    a. level scan
    b. volume scan
    c. linear scan
    d. radar scan
5. Rain and hail will typically be displayed on what radar product?
    a. velocity
    b. reflectivity
    c. rain/hail
    d. wind
6. An appendage or hook shape to the reflectivity echo usually indicates that a thunderstorm is _____.
    a. dissipating
    b. growing
    c. rotating
    d. splitting
7. There are _____ WSR-88D Doppler radars in operation in the nation, including the U.S. Territory of Guam and the Commonwealth of Puerto Rico.
    a. 85
    b. 105
    c. 137
    d. 155

8. The total accumulative time the Doppler radar is transmitting a radar signal is _____.
    a. 7 seconds
    b. 70 seconds
    c. 7 minutes
    d. 17 minutes
9. This phenomenon, called _____, is where the radar beam bends more than normal and is curved more toward the earth's surface.
    a. subrefraction
    b. superrefraction
    c. subreflection
    d. superreflection
10. The atmospheric condition that causes superrefraction which bends the radar beam equal to or more than the earth's curvature is called _____.
    a. tubing
    b. ducting
    c. tunneling
    d. anomalous propagation
11. The best way to determine which way rainfall, as indicted by radar, is moving is to...
    a. look at the radial velocity image.
    b. view the storm relative motion image.
    c. look at the one-hour precipitation image.
    d. view a loop of the reflectivity images.
12. Weather warnings are displayed on the Doppler radar in what four colors...
    a. red, orange, yellow, and purple.
    b. yellow, red, green, and purple.
    c. red, yellow, green, and blue.
    d. green, orange, purple, and blue.
13. The time listed on the NWS Doppler radar images is in _____
    a. z-time
    b. c-time.
    c. Daylight Saving Time
    d. Eastern Standard Time
14. Which of the following Doppler radar images is not available from the NWS is...
    a. One-hour Precipitation.
    b. Base Velocity.
    c. Composite Velocity.
    d. Composite Reflectivity.
15. In the velocity images from the NWS Doppler radar, red colors mean the wind is _____ and the green colors mean the wind is _____.
    a. moving toward from the radar, moving away the radar
    b. moving away from the radar, moving toward the radar
    c. moving faster, moving slower
    d. moving slower, moving faster
16. AP stands for...
    a. almost precipitation
    b. any precipitation
    c. after propagation
    d. anomalous propagation
17. When viewing the Doppler radar velocity images (Base Velocity and Storm Relative Motion), red colors indicated wind moving toward the radar and green colors mean wind is moving away from the radar.
    a. True
    b. False
18. The term for the bending of the radar beam through the atmosphere is called...
    a. Contraction
    b. Refraction
    c. Diffraction
    d. Reflection
19. On the RIDGE radar base reflectivity display, the color green indicates all of the following except...
    a. inbound wind.
    b. a value of energy returned to the radar after bouncing off an object.
    c. the beginning of light rain.
    d. the color of the 20 dBZ level.

20. In this modern age, the NWS Doppler radar image presents an accurate picture of the current weather within the range of the radar site.
    a. True
    b. False.

Remote Sensing

1. A satellite in a geosynchronous orbit circles the Earth along the equatorial plane at a speed matching the Earth's rotation. (TRUE, FALSE)

2. Polar Orbiting Environmental Satellites (POES) are the main type used in weather forecasting by the National Weather Service. (TRUE, FALSE)

3. _____ (POES/GOES) satellites provide much more detailed images of the earth than _____ (POES/GOES) satellites.

4. GOES are capable of providing image types of clouds and moisture in three primary forms:
    a. visible, infrared, and water vapor imagery.
    b. liquid, solid, and gas.
    c. clear, cloudy, and rainy places.
5. Which of the following is NOT provided by ASOS (Automated Surface Observing Systems):
    a. Rain beginning and ending
    b. Heights of cloud bases above 30,000 feet
    c. Rapid pressure changes
    d. Wind shifts
6. ASOS weather observation information helps the NWS increase the accuracy and timeliness of its forecasts and warnings (TRUE, FALSE)

7. The radiosonde flight can last in excess of _____ (2/3/4/5) hours, ascend to over _____ (115,000/125,000/135,000) feet, and drift more than _____ (125/150/175/200) miles from the release point.

8. Radiosonde observations are the primary source of upper-air data and will remain so into the foreseeable future. (TRUE, FALSE)
9. The visible portion the electromagnetic spectrum includes what colors?
    a. red, white, and blue
    b. red, yellow, green, blue
    c. infrared, ultraviolet, blue
    d. green, purple, maroon, infrared
10. Electromagnetic waves are like sound waves because they need molecules to travel. (TRUE, FALSE)
11. Which of the following waves is not part of the electromagnetic spectrum?
    a. microwaves
    b. ultraviolet light
    c. radio waves
    d. ocean waves
12. Which type of satellite is best used to help monitor the motion of a hurricane?
    a. GOES
    b. POES
    c. Plymouth
    d. TIROS
13. Unlike POES satellite, GOES satellites orbit at an altitude of approximately _____ miles.
    a. 13,000
    b. 20,000
    c. 22,000
    d. 28,000

14. Concerning GOES satellites, which of the following are true?
    a. Always located in the same spot of the sky relative to the earth.
    b. Orbits at an altitude of about 22,000 miles.
    c. Can record images as fast as once every minute.
    d. View is always from same perspective so motion of clouds over the earth's surface can be computed.
    e. All of the above.
15. _____ (lower in the atmosphere) clouds give off more energy than _____ (higher) clouds.
    a. Warm / Cold
    b. Cold / Warm
    c. Dark / Cold
    d. White / Warm
16. Water vapor imagery is unique in that it can detect water vapor (water in a _____ state) in addition to clouds.
    a. liquid
    b. gas
    c. solid
    d. fluid

National Weather Service

1. The National Weather Service began under the direction of the _____.
    a. Department of Defense
    b. Department of Agriculture
    c. Signal Corp
    d. Corp of engineers

2. The National Weather Service is a federal agency that has been in existence since…
    a. 1870
    b. 1890
    c. 1919
    d. 1968

3. The original name for the National Weather Service was…
    a. The Weather Bureau
    b. The Weather Channel
    c. The Weather Corp
    d. The Bureau for Weather

4. In 1970, the National Weather Service was place under the newly created…
    a. National Aeronautics and Space Administration (NASA)
    b. National Center for Environmental Processing (NCEP)
    c. Department of Energy (DoE)
    d. National Oceanic and Atmospheric Administration (NOAA)

5. Your cost each year, in tax dollars, for the operation of the National Weather Service, per each, man, woman, and child in the country, is…
    a. less than a “kid’s meal.”
    b. about the cost venti latte.
    c. close to the cost of a steak dinner.
    d. too much.

6. There are _____ River Forecast Centers.
    a. 8
    b. 12
    c. 13
    d. 16

Review Question Answers

The Atmosphere

1. C
2. B
3. C
4. B
5. A
6. false
7. harder, less
8. true
9. A
10. D
11. C
12. D
13. A
14. slower, slower
15. true
16. A
17. C
18. B
19. false
20. D

The Ocean

1. C
2. True
3. B
4. C
5. A
6. D
7. C
8. B
9. Ground / Ocean
10. True
11. B
12. C
13. False
14. A
15. False
16. E
17. C
18. C
19. Arctic / Antarctic
20. B

Global Weather

1. B
2. A
3. B
4. false
5. true
6. 30°N/S, 50°-60°N/S
7. D
8. increases, north
9. true
10. D
11. C
12. false
13. C
14. B
15. C
16. A
17. C
18. B
19. D
20. D

Synoptic Weather

1. D
2. false
3. A
4. B
5. C
6. true
7. false
8. true
9. B
10. C
11. A
12. divergence, convergence
13. B
14. A
15. D
16. A
17. C
18. C
19. D
20. B

Thunderstorms

1. C
2. B
3. false
4. C
5. A
6. B
7. D
8. D
9. The change in wind direction and/or speed with change in height.
10. C
11. D
12. A
13. B
14. false
15. false
16. B
17. C

Lightning

1. B
2. C
3. D
4. A
5. E
6. C
7. A
8. A
9. True
10. D
11. D
12. E
13. False
14. D
15. C
16. True
17. A
18. A
19. B
20. B

Tropical Weather

1. tropical, polar
2. False
3. B
4. B
5. D
6. B
7. less
8. B
9. B
10. C
11. E
12. True
13. D
14. B
15. D
16. A
17. D
18. A
19. B
20. False

Doppler Radar

1. A
2. B
3. C
4. B
5. B
6. C
7. D
8. A
9. B
10. B
11. D
12. C
13. A
14. C
15. B
16. D
17. False
18. B
19. A
20. False

18. A
19. supercell
20. C

Remote Sensing

1. True
2. False
3. POES, GOES
4. A
5. B
6. true
7. 2, 115000, 125
8. True
9. B
10. False
11. D
12. A
13. C
14. E
15. A
16. B

National Weather Service

1. C
2. A
3. A
4. D
5. A
6. C
7. D
8. C
9. C
10. B
11. A
12. C
13. True
14. D
15. True
16. A
17. False
18. C