

Name: \_\_\_\_\_ Date: \_\_\_\_\_

**Geog 120: Earth Systems II. Atmosphere**

**Exam 4 (v.3). Weather Patterns, Analysis, Optical phenomena, and Climate**

Instructor: Dr. Stavros T. Constantinou

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**Multiple Choice. Select the best answer and mark the appropriate letter on the computer sheet. Should you change your mind, make sure you erase well. The exam maximum is 100 points.**

1. In which of the following places are thunderstorms most common?
  - a. northern Wisconsin.
  - b. central Nevada.
  - ☞ c. southern Mississippi.
  - d. west of Hudson Bay (Canada).
  - e. the occurrence of thunderstorms at all of these places should be about the same.
  
2. Hurricanes and midlatitude cyclones are similar in that:
  - ☞ a. both are areas of low pressure.
  - b. both have conspicuous surface fronts.
  - c. both are most common and well-developed in the winter season.
  - d. both form in the trade wind belt.
  
3. Which of the following should have the steepest pressure gradient?
  - ☞ a. tornado.
  - b. middle latitude cyclone.
  - c. hurricane.
  - d. all of them should have equally steep pressure gradients.
  - e. both a and c have equally steep pressure gradients.
  
4. Tornadoes are most frequent during the:
  - a. January-March period.
  - ☞ b. April-June period.
  - c. October-December period.
  - d. month of September.
  - e. July-August period.
  
5. "Heat lightning":
  - a. is brighter than ordinary lightning.

- b. is also called "ball lightning."  
c. occurs more than 20 kilometers from the person observing it.  
d. is actually a display of the northern lights.
6. Which of the numbers listed below best represents the percentage of thunderstorms that produce tornados?
- a. less than 1 percent.  
b. about 10 percent.  
c. nearly 25 percent.  
d. slightly more than 50 percent.
7. The formation of tornados is associated with:
- a. severe thunderstorms.  
b. cold fronts.  
c. middle-latitude cyclones.  
d. all of the above.
8. Updrafts dominate the \_\_\_\_\_ and downdrafts dominate the \_\_\_\_\_ in the development of a thunderstorm.
- a. cumulus stage/dissipating stage  
b. mature stage/dissipating stage  
c. dissipating stage/cumulus stage  
d. convective stage/cumulus stage
9. In the development of a thunderstorm, sharp and cool gusts beginning at the surface are characteristic in the \_\_\_\_\_.
- a. cumulus stage.  
b. mature stage.  
c. dissipating stage.  
d. convective stage
10. The eye of a hurricane:
- a. is the portion with the highest wind speeds.  
b. is warmer than the rest of the storm.  
c. is a figment of man's imagination.  
d. has the most intense rainfall.  
e. none of these.
11. Hurricanes generally are:
- a. larger than tornadoes.  
b. smaller than midlatitude cyclones.  
c. areas of heavy rainfall and strong winds.

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- d. most common in late summer and early fall.  
e. all of these.
12. When a hurricane moves onto land, it rapidly loses its punch, that is, the storm declines in intensity. Which of the factors listed below contributes to this loss of punch?  
a. friction.  
b. lack of warm, moist air.  
c. heating from below by the land surface.  
d. both a and b.  
e. both b and c.
13. During which of the time spans listed below should hurricane formation in the North Atlantic be at a peak?  
a. January-February.  
b. April-May.  
c. August-September.  
d. November-December.
14. Which of the following is more intense?  
a. tropical disturbance.  
b. tropical storm.  
c. tropical depression.  
d. all are equally intense.
15. The \_\_\_\_\_ scale is used to establish categories of hurricane intensity.  
a. Fujita  
b. Saffir-Simpson  
c. Stormfury  
d. Johnson
16. As a strong hurricane moves ashore, which of the following causes the most devastating damage in the coastal zone?  
a. torrential rains.  
b. strong winds.  
c. storm surge.  
d. all are equally significant.

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17. The job of generating a general prognostic chart is accomplished by:
- a. a weather analyst.
  - b. a weather reporter.
  - c. a weather prognostic.
  - ☞ d. a weather forecaster.
18. Which of the following data is not plotted on a weather chart?
- a. temperature.
  - b. dew point temperature.
  - c. cloud height.
  - ☞ d. relative humidity.
  - e. sky cover.
19. Which of the following weather data is not always plotted in the same location with respect to the weather station?
- a. barometric pressure.
  - b. past weather.
  - ☞ c. wind direction.
  - d. cloud type.
  - e. pressure tendency.
20. The job of collecting, compiling and displaying weather data is done by:
- ☞ a. a weather analyst.
  - b. a weather reporter.
  - c. a weather prognostic.
  - d. a weather forecaster.
21. A major drawback of the analog method of weather forecasting is:
- a. old weather charts are very inaccurate.
  - b. computers are not fast enough to process the data.
  - ☞ c. there are too many variables to match.
  - d. the sun's influence on the weather is not completely understood.
22. The property of light that causes your arm to look bent when it is submerged in water is called:
- a. dispersion.
  - b. interference.
  - ☞ c. refraction.

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- d. reflection.
  - e. diffraction.
23. Bending of light as it passes a sharp edge is called:
- a. dispersion.
  - b. interference.
  - c. refraction.
  - d. reflection.
  - ☞ e. diffraction.
24. The angle of incidence is equal to the angle of \_\_\_\_\_.
- a. dispersion.
  - b. interference.
  - c. refraction.
  - ☞ d. reflection.
  - e. diffraction.
25. The \_\_\_\_\_ is seen most often in morning and late afternoon when the sun is near the horizon.
- a. rainbow
  - b. halo
  - c. sun dog
  - d. corona
  - ☞ e. a, b, and c
26. The \_\_\_\_\_ forms in association with the moon as well as the sun.
- a. rainbow
  - ☞ b. halo
  - c. sun dog
  - d. glory
  - e. corona
27. The \_\_\_\_\_ is found more frequently in association with the moon.
- a. rainbow
  - b. halo
  - c. sun dog
  - d. glory
  - ☞ e. corona

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28. The \_\_\_\_\_ enshrouds the head of the observer.
- a. rainbow
  - b. halo
  - c. sun dog
  - ☞ d. glory
  - e. corona
29. The \_\_\_\_\_ is more frequently observed in arctic locations.
- a. rainbow
  - b. halo
  - ☞ c. sun dog
  - d. glory
  - e. corona
30. In the wet tropics:
- ☞ a. daily temperature ranges usually exceed the annual temperature range.
  - b. daily and annual temperature ranges are nearly identical.
  - c. the annual temperature range usually exceeds the daily temperature ranges.
  - d. the warmest month is always June or July.
31. What is the most important factor controlling the seasonal distribution of precipitation in the Aw (Tropical Wet and Dry) realm?
- ☞ a. migration of the ITC.
  - b. movement of cyclonic storms.
  - c. the location of mountain ranges.
  - d. proximity to maritime tropical air masses.
  - e. none of these.
32. When comparing west coast tropical deserts like the Namib and Atacama with more typical tropical deserts like the Sahara, we can say that west coast tropical deserts are:
- a. more humid.
  - b. foggier.
  - c. drier (less precipitation.)
  - ☞ d. all of these (a, b, and c.)
  - e. both a and b, but not c.
33. Although the subarctic and tundra climates generally have small precipitation totals, they are considered humid. The reason for this is:
- a. most of the precipitation falls in the winter.
  - b. these regions have great reserves of underground water that can be used for irrigation.

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- c. permafrost does not let the water escape.
  - ☞ d. low temperatures mean only a small loss to evaporation.
  - e. since there are no trees present, little or no water is lost because of transpiration.
34. In the humid continental climate, shifts in wind directions sometimes cause rapid and large temperature changes. During what season would this be most pronounced?
- a. summer.
  - ☞ b. winter.
  - c. this phenomenon is equally characteristic of both summer and winter.
  - d. none of the above
- 35. Which of the following statements is not true regarding the tropical rain forest?**
- a. **it is also called selvas**
  - ☞ b. **it is dominated by just a few different species of trees**
  - c. **the trees of the tropical rain forest are broadleaf evergreens**
  - d. **plant foliage is relatively sparse on the forest floor**
36. All of the cities described below are in North America and are classified as humid climates. Which city has the highest total rainfall?
- ☞ a. City A, a leeward coastal city at 40° north latitude.
  - b. City B, a city in the interior of the continent at 40° north latitude.
  - c. City C, a city in the interior of the continent at 50° north latitude.
  - d. all of these.
37. All of the cities described below are in North America and are classified as humid continental climates. Which city is intermediate among the three cities in terms of total annual precipitation?
- a. City A, a leeward coastal city at 40° north latitude.
  - ☞ b. City B, a city in the interior of the continent at 40° north latitude.
  - c. City C, a city in the interior of the continent at 50° north latitude.
  - d. all of these.
38. All of the cities described below are in North America and are classified as humid continental climates. Which city has a summer maximum of precipitation?
- a. City A, a leeward coastal city at 40° north latitude.
  - b. City B, a city in the interior of the continent at 40° north latitude.
  - c. City C, a city in the interior of the continent at 50° north latitude.
  - ☞ d. all of these.

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39. All of the cities described below are in North America and are classified as humid continental climates. Which of the three cities would have the highest annual temperature range?
- a. City A, a leeward coastal city at 40° north latitude.
  - b. City B, a city in the interior of the continent at 40° north latitude.
  - ☞ c. City C, a city in the interior of the continent at 50° north latitude.
  - d. all of these.
40. Four of the five major climatic groups listed below have temperature characteristics as their basis. Which one of them does not?
- a. A climates
  - ☞ b. B climates
  - c. C climates
  - d. D climates
  - e. E climates
41. In the wet tropics:
- ☞ a. daily temperature ranges usually exceed the annual temperature range
  - b. daily and annual temperature ranges are nearly identical
  - c. the annual temperature range usually exceeds daily temperature ranges
  - d. the warmest month is always June or July
42. Most places having an Aw climate experience:
- a. precipitation distributed evenly throughout the year
  - ☞ b. a summer maximum of precipitation
  - c. a winter maximum of precipitation
  - d. it is not possible to generalize about seasonal distribution of rainfall in Aw climates
43. The vegetation associated with the Aw climate is termed:
- a. jungle
  - ☞ b. savanna
  - c. taiga
  - d. selva
  - e. none of these
44. **What is the most important factor controlling the seasonal distribution of precipitation in the Aw (Tropical Wet and Dry) realm?**
- ☞ a. **migration of the ITC**
  - b. **movement of cyclonic storms**
  - c. **the location of mountain ranges**

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- d. proximity to maritime tropical air masses
  - e. none of these
45. Deserts such as the Sahara exist because of:
- a. extreme continentality
  - b. the rain shadow effect on mountains
  - c. the desiccating influence of the trade winds
  - ☞ d. the influence of the subtropical highs
  - e. none of these
46. When comparing west coast tropical deserts like the Namib and Atacama with more typical tropical deserts like the Sahara, we can say that west coast tropical deserts are:
- a. more humid
  - b. foggier
  - c. drier (less precipitation)
  - ☞ d. all of these (a, b, and c)
  - e. both a and b but not c
47. Middle latitude deserts (BWk) and steppes (BSk):
- a. are more common in the Northern Hemisphere than in the Southern Hemisphere
  - b. are usually located deep in the interior of a continent
  - c. are dominated by the subtropical highs
  - ☞ d. both a and b
  - e. both b and c
48. Although the subarctic and tundra climates generally have small precipitation totals, they are considered humid. The reason for this is:
- a. most of the precipitation falls in the winter
  - b. these regions have great reserves of underground water that can be used for irrigation
  - c. permafrost does not let the water escape
  - ☞ d. low temperatures mean only a small loss to evaporation
  - e. since there are no trees present, little or no water is lost because of transpiration
49. On which of these continents is the marine west coast climate most extensive?
- a. South America
  - ☞ b. Europe
  - c. Australia

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- d. North America
  - e. Africa
50. The dry-summer subtropical climate is called the \_\_\_\_\_ climate.
- a. savanna
  - ☞ b. Mediterranean
  - c. taiga
  - d. monsoon
  - e. none of these
51. What is the only humid climate that has a strong winter precipitation maximum?
- ☞ a. Mediterranean climate (Csa and Csb)
  - b. humid subtropical climate (Cfa)
  - c. tropical wet and dry climate (Aw)
  - d. humid continental climate (Dfa, Dfb, Dwa, Dwb)
  - e. tundra climate (ET)
52. In humid continental climate, shifts in wind direction sometimes cause rapid and large temperature changes. During what season would this be most pronounced?
- a. summer
  - ☞ b. winter
  - c. this phenomenon is equally characteristic of both summer and winter
53. Places having this climate typically experience the highest annual temperature range of any climatic type.
- a. humid subtropical climate
  - ☞ b. subarctic climate
  - c. tundra climate
  - d. ice cap climate
  - e. none of these