

Meteorology B - Meteorology - BirdSO B 2024 Satellite Invitational - 02-24-2024

Answer Keys for Grading (/birdso/SM/AnswerKeys?tid=000EB0)

Questions 1-3 deal with the image below.

CATEGORY		DAMAGE
1	74-95	SOME
2	96-110	EXTENSIVE
3	111-129	DEVASTATING
4	130-156	CATASTROPHIC
5	157+	CATASTROPHIC

1. (1.00 pts) What property of a hurricane is measured by the middle column?

Expected Answer: wind speed

2. (1.00 pts) What is the name of the scale that is represented by the image?

Expected Answer: Saffir-Simpson wind scale

3. (3.00 pts) A major hurricane is represented by which categories above?

Expected Answer: 3, 4, 5

4. (1.00 pts) Does a hurricane rotate counterclockwise or clockwise?

Expected Answer: counterclockwise

5. (2.00 pts) What are the starting and ending dates for the Atlantic hurricane season?

Expected Answer: June 1st and November 30th

6. (2.00 pts) What is the main difference between a tropical and an extratropical cyclone?

Expected Answer: tropical has a hot core while extratropical has a cold core

7. (2.00 pts) What month is the climatological peak of the hurricane season?

Expected Answer: September

8. (1.00 pts) What phenomenon acts against a tropical cyclone during development that can be detected through uneven distribution of clouds on either side?

Expected Answer: wind shear

9. (1.00 pts) What phenomenon occurs when the low pressure of the hurricane causes water to lift up and crash ashore?

Expected Answer: storm surge

10. (1.00 pts) The failure of what construct in New Orleans caused massive flooding by storm surge in Hurricane Katrina?

Expected Answer: levee

11. (2.00 pts) What two properties of a tornado does the Enhanced Fujita Scale use to determine its categories?

Expected Answer: wind speed and related damage

12. (1.00 pts) How many ratings are contained in the Enhanced Fujita Scale?

Expected Answer: 6

13. (1.00 pts) What process results in tornadoes rotating along a vertical axis?

Expected Answer: tilting

14. (1.00 pts) What kind of front are tornadoes usually formed along?

Expected Answer: cold front

15. (2.00 pts) What is the difference between tornadic and fair weather waterspouts?

Expected Answer: how they form: tornadic through tornadoes down from clouds and fair weather in fair weather going up from the water

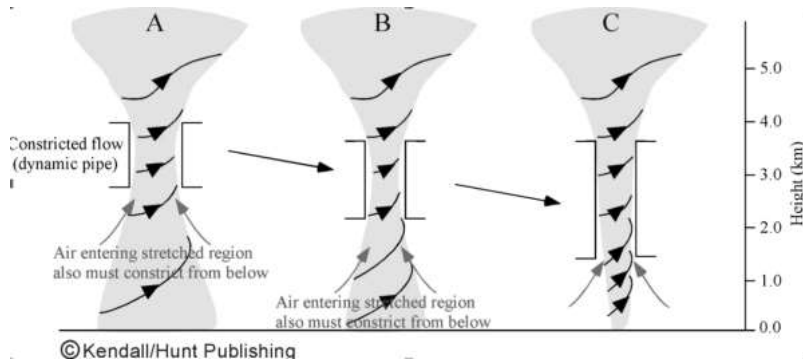
16. (1.00 pts) What is the number of the damage indicator for the Enhanced Fujita Scale that is damage to a motel?

Expected Answer: 6

17. (5.00 pts) What are the five stages of waterspout formation according to Dr. Joseph Golden?

Expected Answer: dark spot, spiral pattern, spray ring, mature vortex, decay

18. (1.00 pts) The image below illustrates what process of tornado formation?

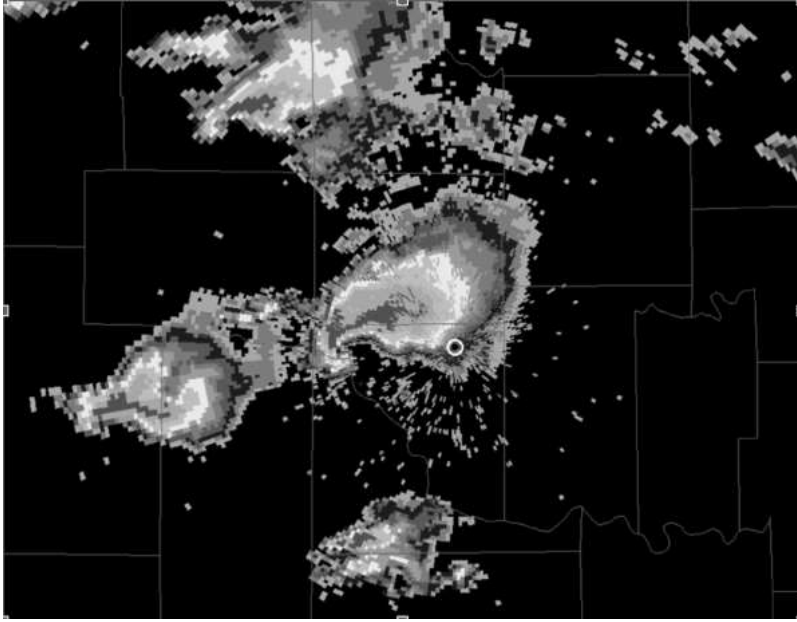


Expected Answer: Top-Down process

19. (1.00 pts) What phenomenon in tornadoes can occur with a difference in wind speeds/directions in different elevations?

Expected Answer: wind shear

20. (1.00 pts) The image below shows the detection of what pattern in radar reflectivity images?



Expected Answer: hook echo

21. (1.00 pts) What is the minimum wind speed that the National Weather Service defines a winter storm to be a blizzard in miles per hour?

Expected Answer: 35 mph

22. (1.00 pts) What direction does the wind in a nor'easter usually come from?

Expected Answer: Northeast

23. (1.00 pts) What set of lakes is lake effect snow most commonly associated with?

Expected Answer: The Great Lakes

24. (1.00 pts) What is one unique aspect of lake effect snow that can be dangerous to motorists and pedestrians?

Expected Answer: variability of snowfall amounts

25. (1.00 pts) What is the name for ice on roadways that cannot be easily seen?

Expected Answer: black ice

26. (2.00 pts) How can floods occur thanks to ice in lakes and rivers?

Expected Answer: ice breaks up through melting or rise in water level and chunks break off and get jammed

27. (1.00 pts) What kind of blizzard is caused by one in which snow has previously fallen but in which snow is not necessarily falling?

Expected Answer: ground blizzard

28. (1.00 pts) What side of an intense storm system do blizzard conditions usually form in?

Expected Answer: northwest

29. (1.00 pts) On what coast of North America do nor'easters usually form?

Expected Answer: East Coast

30. (1.00 pts) What current in the Atlantic Ocean helps feed the conditions necessary for nor'easters to form?

Expected Answer: Gulf Stream

31. (1.00 pts) Do cyclones rotate clockwise or counterclockwise?

Expected Answer: clockwise

32. (1.00 pts) What hemisphere do cyclones occur in?

Expected Answer: Southern

33. (1.00 pts) What ocean do cyclones usually occur in?

Expected Answer: Indian

34. (1.00 pts) In what direction do cyclones usually go in?

Expected Answer: North

35. (1.00 pts) A tropical storm watch suggests that tropical storm conditions could arrive at an area covered under the watch within how many hours?

Expected Answer: 48

36. (1.00 pts) The feature of a cloud that contains severe weather that's known for its elongated top is named after what object?

Expected Answer: anvil

37. (1.00 pts) A shelf cloud can be located at what edge of a storm?

Expected Answer: leading edge

38. (2.00 pts) What is the difference between a shelf cloud and a roll cloud?

Expected Answer: shelf is attached to the thunderstorm while roll cloud is completely detached from the storm

39. (1.00 pts) What kind of cloud is the main source of thunderstorms?

Expected Answer: cumulonimbus

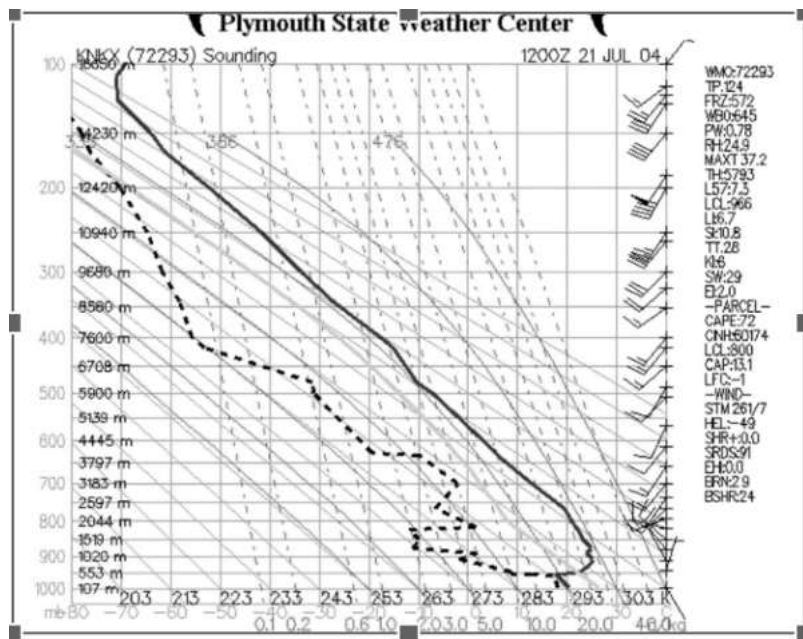
40. (1.00 pts) What kind of cloud exhibits itself through lowering from the rain-free base of a thunderstorm?

Expected Answer: wall cloud

41. (2.00 pts) What is the main difference between a watch and a warning?

Expected Answer: watch means conditions are possible while warning means conditions are imminent or occurring soon

Questions 42-45 deal with the following diagram.



42. (1.00 pts) The diagram is known as what kind of diagram?

Expected Answer: stüve diagram

43. (2.00 pts) What quantity is measured on the X-axis and Y-axis respectively?

Expected Answer: temperature and air pressure/elevation

44. (1.00 pts) What quantity do the dashed green lines represent?

Expected Answer: saturation mixing ratio

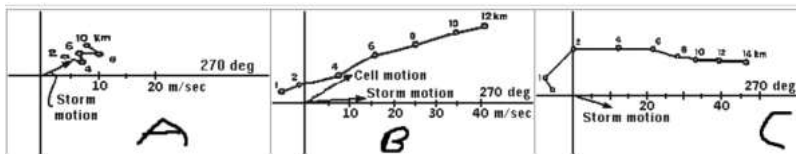
45. (1.00 pts) The dotted black line represents what quantity?

Expected Answer: dew point

46. (1.00 pts) What tool is used to measure the path between wind vectors in the atmosphere at various heights?

Expected Answer: hodographs

47. (3.00 pts) Given the image below, name for each letter what type of thunderstorm the letter represents.



- a. B
- b. C
- c. A

Expected Answer: a. Multicell b. Supercell c. Ordinary

48. (1.00 pts) What kind of thunderstorm has the highest chance of producing tornadoes?

Expected Answer: supercell

49. (1.00 pts) What is the usual max lasting time of a single-cell thunderstorm?

Expected Answer: one hour

50. (1.00 pts) In what part of a bow echo is the storm moving most quickly?

Expected Answer: in the middle

51. (3.00 pts) Give the three quantities that are measured in an IDF curve.

Expected Answer: intensity of precipitation, duration of precipitation, and frequency of precipitation

52. (1.00 pts) According to NOAA, how big in diameter must hail be in order to be considered large and severe?

Expected Answer: ¾ inch

53. (2.00 pts) What is the difference between sleet and freezing rain?

Expected Answer: sleet is when snow partially melts when going through a warmer layer and freezing rain is when snow completely melts when going through a warmer layer

54. (1.00 pts) The lowering of what value allows the wind in a Bora to flow fast down the slope and for the cold air layer to go downward?

Expected Answer: air pressure

55. (2.00 pts) What is the main difference between a Foehn wind and a Bora wind?

Expected Answer: Foehn is warm air while Bora is cold air

56. (1.00 pts) What natural phenomena can Foehn winds exacerbate in the summer?

Expected Answer: forest fires

57. (1.00 pts) What wind event is usually accompanied by bands of rapidly-moving thunderstorms and usually consist of multiple microbursts and downbursts?

Expected Answer: derecho

58. (1.00 pts) Are squall lines more or less likely to produce tornadoes than supercells?

Expected Answer: less likely

59. (1.00 pts) How much rotation is involved with straight-line winds?

Expected Answer: none

60. (1.00 pts) Are wind direction and/or speed the same in horizontal wind shear at the same elevation?

Expected Answer: No

61. (1.00 pts) Downslope winds occur along what geologic features?

Expected Answer: mountains

62. (1.00 pts) What are the two kinds of microbursts?

Expected Answer: wet and dry

63. (1.00 pts) What kind of winds are strong downbursts that reach the surface and show strong outbursts of wind and that are bigger than microbursts?

Expected Answer: macrobursts

64. (1.00 pts) A squall line is usually situated along what kind of front?

Expected Answer: cold front

65. (1.00 pts) What structure within a squall line is represented by an arched line of thunderstorms?

Expected Answer: bow echo/bowing line segment

66. (2.00 pts) What are the two basic patterns of squall lines?

Expected Answer: Progressive and Serial

67. (1.00 pts) Do most damage caused by bow echoes occur due to tornadoes?

Expected Answer: No

68. (1.00 pts) What is the term for the leading edge of rain-cooled air that can lead to multi-cell storms forming?

Expected Answer: gust front

69. (1.00 pts) What is the name for the type of lightning that occurs entirely within a single storm cloud?

Expected Answer: Intracloud lightning

70. (1.00 pts) Tall buildings and skyscrapers can usually cause what kind of lightning to occur that can be in either polarity?

Expected Answer: ground-to-cloud lightning

71. (1.00 pts) What type of lightning is too far to be heard?

Expected Answer: heat lightning

72. (1.00 pts) Does a downdraft go towards or away from the ground?

Expected Answer: towards

73. (1.00 pts) What kind of lightning does the Advanced Lightning Direction Finder detect?

Expected Answer: cloud-to-ground lightning

74. (1.00 pts) What is the lowest possible correlation coefficient?

Expected Answer: 0

75. (1.00 pts) Pure rain or snow leads to a correlation coefficient closer to what number?

Expected Answer: 1