PRACTICE EXAM 24 SIMULATION

1. A pilot must understand that a temperature inversion is characterized by what condition in the atmosphere?

A. Temperature increasing with altitude instead of the normal decrease

B. Temperature decreasing rapidly with altitude above the inversion layer

C. Pressure increasing with altitude through the affected atmospheric layer

D. Humidity decreasing sharply with altitude through the inversion zone

2. Radiation fog typically forms under which set of atmospheric conditions?

A. Strong winds moving moist air over a colder land or water surface

B. Warm moist air being lifted rapidly over rising mountainous terrain

C. Heavy precipitation saturating the air mass beneath a warm front

D. Clear skies, light winds, and high humidity over land during the night

3. A pilot must understand that the most hazardous type of icing forms from what?

A. Small supercooled droplets freezing instantly on contact with the airframe

B. Frost forming overnight on a parked aircraft before the first flight

C. Snow accumulating on the upper wing surface during a ground delay

D. Large supercooled droplets freezing slowly and spreading back over the wing

4. The four stages required for a thunderstorm to form include moisture, instability, and lift. What is the typical sequence of a thunderstorm's life cycle?

A. Mature, cumulus, dissipating, then a redeveloping secondary cell stage

B. Dissipating, cumulus, mature, then a final towering cumulus stage

C. Cumulus, mature, then dissipating as the downdrafts dominate the cell

D. Cumulus, dissipating, mature, then a steady-state supercell stage

5. A pilot encounters a squall line on the route of flight. The recommended action is what?

A. Fly beneath the squall line at the lowest safe terrain clearance altitude

B. Penetrate the line at a right angle to minimize the time spent inside it

C. Climb above the squall line to overfly the embedded thunderstorm cells

D. Deviate around the line, as squall lines often cannot be safely penetrated

6. Clear air turbulence (CAT) is most commonly associated with what atmospheric feature?

A. The center of a stationary high-pressure system over flat terrain

B. The base of stratus clouds during a period of stable air conditions

C. A region of widespread precipitation behind a slow-moving warm front

D. The jet stream and areas of strong wind shear at high altitudes

7. A pilot must understand that a stable air mass is generally characterized by what weather phenomena?

A. Stratiform clouds, steady precipitation, and smooth air with poor visibility

B. Cumuliform clouds, showery precipitation, and good visibility with turbulence

C. Towering cumulus, gusty surface winds, and excellent visibility after rain

D. Rapidly building thunderstorms, hail, and severe low-level wind shear aloft

8. Structural icing requires two conditions to be present simultaneously. What are they?

A. Strong surface winds and a temperature above the freezing point of water

B. Visible moisture and a temperature at or below freezing on the airframe

C. Clear skies and a rapidly falling barometric pressure ahead of a front

D. High humidity at the surface and a stable air mass with light winds aloft

9. A warm front is depicted on a surface analysis chart by what symbol?

A. A blue line with triangles pointing in the direction of frontal movement

B. A red line with semicircles pointing in the direction of frontal movement

C. A purple line with alternating triangles and semicircles on the same side

D. A black line with both triangles and semicircles pointing opposite directions

10. A pilot must understand that advection fog forms by what process?

A. Nighttime radiational cooling of the ground beneath a clear, calm sky

B. Air being cooled adiabatically as it rises over a mountain barrier slowly

C. Precipitation falling through a dry layer and evaporating into the air mass

D. Moist air moving horizontally over a colder surface, cooling to its dew point

11. The lifting of an air mass that triggers thunderstorm development can be caused by which mechanism?

A. The compression of air sinking within a high-pressure system descending

B. The cooling of the surface during a clear and calm overnight period

C. Frontal lifting, orographic lifting, convective heating, or convergence

D. The horizontal movement of a stable air mass across a warm ocean current

12. A pilot must recognize that wind shear is most hazardous during which phase of flight?

A. The cruise phase at high altitude in smooth and stable air conditions

B. The approach and departure phases near the ground at low airspeed

C. The taxi phase on the ground before the takeoff roll has commenced

D. The enroute climb above the freezing level in clear air conditions

13. A microburst is a particularly dangerous form of wind shear characterized by what?

A. A sustained horizontal wind from a single constant direction at altitude

B. A localized intense downdraft producing diverging outflow at the surface

C. A gradual change in wind speed over a wide area along a frontal boundary

D. A swirling rotational column of air extending from a thunderstorm base

14. A pilot interpreting the dew point spread understands that a small spread indicates what?

A. Air near saturation, with a higher likelihood of clouds or fog forming

B. Air that is very dry, with little chance of cloud or fog formation soon

C. A rapidly approaching cold front bringing clearing skies behind it

D. An unstable air mass likely to produce afternoon thunderstorm activity

15. A pilot must understand that the freezing level is significant for icing because ice can form where?

A. Only at altitudes well above the freezing level in the coldest air present

B. In visible moisture at or above the freezing level where droplets are supercooled

C. Only below the freezing level where the air remains above zero degrees Celsius

D. At the surface only, where frost forms on the aircraft during cold nights

16. A cold front typically produces what type of weather compared to a warm front?

A. Gradual, widespread, and long-lasting precipitation over a broad area

B. Clear and stable conditions with light winds and excellent visibility

C. A narrow band of intense weather with showers, gusty winds, and turbulence

D. A slow-moving overcast layer of stratus with continuous light drizzle

17. A pilot must understand that the standard temperature lapse rate used in the International Standard Atmosphere is closest to which value?

A. About 1 degree Celsius of cooling per 1,000 feet of altitude gained

B. About 5 degrees Celsius of cooling per 1,000 feet of altitude gained

C. About 2 degrees Celsius of cooling per 1,000 feet of altitude gained

D. About 4 degrees Celsius of cooling per 1,000 feet of altitude gained

18. A pilot planning an IFR flight should be aware that "embedded thunderstorms" present what particular hazard?

A. They are concealed within other cloud layers and cannot be seen visually

B. They form only at night and dissipate quickly after the sun rises again

C. They produce only light turbulence that is easily managed with autopilot

D. They remain stationary and can be reliably avoided by a small detour

19. A pilot must understand that supercooled large droplets (SLD) pose what specific icing danger?

A. They can freeze beyond the protected areas, behind deicing boots and surfaces

B. They form only frost on the windscreen, which is easily cleared with heat

C. They produce light rime ice that has no significant effect on performance

D. They occur only above 30,000 feet, well above most light aircraft operations

20. The wind associated with the passage of a cold front typically does what in the Northern Hemisphere?

A. Backs counterclockwise and decreases in velocity after the front passes

B. Remains steady from the same direction throughout the frontal passage

C. Decreases sharply and becomes calm immediately behind the front itself

D. Veers clockwise and often becomes gusty as the front passes the station

21. A pilot must understand that mountain wave turbulence forms under what conditions?

A. Strong winds blowing perpendicular to a mountain ridge with a stable layer aloft

B. Light and variable winds over flat terrain during a warm summer afternoon

C. Calm conditions in a valley during a nighttime temperature inversion period

D. Moist tropical air moving slowly across a warm ocean surface near the coast

22. A pilot interpreting a station's reported weather sees the temperature and dew point converging. This trend most likely indicates what?

A. Conditions are becoming favorable for fog or low cloud formation soon

B. A strong cold front is approaching and will bring clearing skies behind it

C. The air mass is drying out and visibility will improve over the next hours

D. Surface winds will increase significantly as a pressure gradient tightens

23. A pilot must understand that "freezing rain" indicates what about the temperature structure aloft?

A. The entire column of air from the cloud to the surface is below freezing

B. A shallow cold layer at the surface beneath a deep layer of warm dry air

C. A warmer layer aloft where rain forms, falling into a freezing layer below

D. A uniform temperature throughout the column exactly at the freezing point

24. A pilot must recognize that the greatest turbulence and hazards in a thunderstorm occur during which stage?

A. The cumulus stage, when the updrafts first begin to build the cell vertically

B. The mature stage, when both strong updrafts and downdrafts coexist with precipitation

C. The dissipating stage, when downdrafts dominate and the cell weakens overall

D. The towering stage, before any precipitation has begun to fall from the cloud

25. A pilot must understand that an occluded front forms when what occurs?

A. A faster cold front overtakes a slower warm front, lifting the warm air aloft

B. Two warm fronts merge together over a region of high atmospheric pressure

C. A stationary front begins moving rapidly toward a low-pressure center nearby

D. A cold front and a warm front move in parallel without any interaction at all

26. A pilot must understand that fog will most likely form when the temperature-dew point spread narrows to what?

A. A spread of about 10 degrees Celsius between the temperature and dew point

B. A spread of about 6 degrees Celsius between the temperature and dew point

C. A spread of a few degrees or less between the temperature and dew point

D. A spread of about 15 degrees Celsius between the temperature and dew point

27. A pilot must understand that the term "convective" weather refers to phenomena driven by what?

A. The horizontal movement of large air masses across the surface of the earth

B. The vertical movement of air due to heating and instability in the atmosphere

C. The frictional effect of wind passing over rough terrain near the surface

D. The cooling of the upper atmosphere during the nighttime radiation period

28. A pilot must recognize that flight into an area of known or forecast severe icing requires what?

A. A simple reduction in cruise airspeed to allow the ice to shed naturally

B. An increase in altitude to climb above the freezing level immediately

C. Avoidance, as severe icing can exceed the capability of any anti-ice equipment

D. Continued flight while monitoring the rate of ice accumulation on the wings

29. A pilot interpreting a prognostic chart sees a forecast of "MVFR" conditions. This category indicates what?

A. Conditions at or above 3,000 feet ceiling and 5 miles visibility, fully VFR

B. Conditions below 500 feet ceiling and 1 mile visibility, the lowest category

C. Marginal conditions of 1,000 to 3,000 feet ceiling and 3 to 5 miles visibility

D. Instrument conditions below 1,000 feet ceiling and below 3 miles visibility

30. A pilot must understand that wind generally does what with increasing altitude due to decreasing surface friction?

A. The wind increases in speed and veers clockwise with increasing altitude

B. The wind decreases in speed and backs counterclockwise with altitude gained

C. The wind remains exactly constant in both speed and direction with altitude

D. The wind reverses direction completely above the planetary boundary layer

31. A pilot must understand that "virga" observed from the cockpit refers to what phenomenon?

A. A rotating wall cloud lowering from the base of a severe thunderstorm cell

B. A funnel cloud that has not yet reached the ground beneath a storm base

C. A layer of fog forming in a valley during the early morning hours after dawn

D. Precipitation falling from a cloud that evaporates before reaching the ground

32. A pilot must understand that an air mass takes on the characteristics of what?

A. The upper-level jet stream winds that steer it across the continent rapidly

B. The frontal boundaries it encounters along its path of travel over time

C. The surface region over which it forms and remains for an extended period

D. The altitude at which it is observed by the weather reporting station network

33. A pilot encountering rain that suddenly turns to ice on the windscreen has most likely entered what?

A. Freezing rain, indicating a temperature inversion with warmer air aloft present

B. A region of clear-air turbulence associated with the jet stream wind shear

C. The downdraft region of a mature thunderstorm cell producing heavy rainfall

D. An area of radiation fog that has begun to freeze onto the cold airframe surface

34. A pilot must understand that the strongest winds within the jet stream are typically found where?

A. Near the surface within the planetary boundary layer over open ocean areas

B. Within the core of a stationary high-pressure system over the continent

C. Below 10,000 feet in the warm sector ahead of an approaching warm front

D. Near the tropopause, often between 30,000 and 40,000 feet in altitude

35. A pilot must understand that a "trough" of low pressure on a weather chart is typically associated with what?

A. Clouds, precipitation, and unsettled weather along the trough axis line

B. Clear skies, sinking air, and stable conditions over a wide region

C. Light and variable winds with excellent visibility in all directions

D. A sharp temperature inversion trapping smoke and haze near the surface

36. A pilot must recognize that ice accumulation on the airframe affects performance by doing what?

A. Increasing weight and drag while decreasing lift and the stall margin

B. Increasing lift and reducing drag, improving the climb performance temporarily

C. Having no measurable effect until a thick layer of ice has accumulated

D. Only affecting the radio antennas without changing the aerodynamic surfaces

37. A pilot must understand that "PIREPs" are valuable because they provide what?

A. A computer-generated forecast of conditions expected over the next 24 hours

B. Actual conditions observed and reported by pilots in flight at specific locations

C. The official terminal aerodrome forecast issued by the weather service hourly

D. A graphical depiction of frontal positions on the surface analysis chart only

38. A pilot must understand that a "dry line" separates what two air masses?

A. A cold polar air mass from a warmer tropical maritime air mass at a front

B. Two air masses of identical moisture content but different temperatures aloft

C. A stable air mass below an inversion from an unstable air mass above it

D. A moist air mass from a dry air mass, often triggering thunderstorm development

39. A pilot must understand that turbulence reported as "severe" causes what effect on the aircraft?

A. Slight, rapid, and rhythmic bumpiness without appreciable changes in attitude

B. Large abrupt changes in altitude and attitude, with the aircraft momentarily out of control

C. A steady, continuous light chop that is easily managed with the autopilot engaged

D. A gradual rocking motion that diminishes as the aircraft climbs to altitude

40. A pilot must recognize that the lowest cloud layer reported as "broken" or "overcast" constitutes what?

A. The reported visibility limit measured horizontally at the surface level

B. The freezing level above which structural icing becomes a serious hazard

C. The ceiling, the height of the lowest broken or overcast layer above ground

D. The maximum altitude at which visual flight rules operations are permitted

41. A pilot must understand that "lake effect" snow forms by what process?

A. Warm dry air descending the lee side of a mountain range near a large lake

B. A cold front stalling over a frozen lake surface during the winter months

C. Cold air moving across a relatively warm lake, picking up moisture and instability

D. Radiational cooling over a calm lake surface during a clear winter night

42. A pilot must understand that the term "ISA" (International Standard Atmosphere) defines a sea-level temperature of what?

A. A sea-level temperature of 15 degrees Celsius, or 59 degrees Fahrenheit

B. A sea-level temperature of 0 degrees Celsius, or 32 degrees Fahrenheit

C. A sea-level temperature of 20 degrees Celsius, or 68 degrees Fahrenheit

D. A sea-level temperature of 25 degrees Celsius, or 77 degrees Fahrenheit

43. A pilot must understand that wind shear can occur in clear air near what feature even without clouds present?

A. A temperature inversion or a frontal boundary aloft with differing wind layers

B. A region of uniform pressure and temperature over a flat continental plain

C. The center of a slow-moving high-pressure system during a calm period

D. A layer of stratus cloud producing steady and continuous light precipitation

44. A pilot must understand that the most reliable way to avoid thunderstorm hazards is to do what?

A. Fly directly beneath the storm where the precipitation appears lightest visually

B. Penetrate the storm quickly at the altitude of the freezing level to minimize ice

C. Avoid the storm entirely by a wide margin, never attempting to penetrate it

D. Circle the storm at close range to monitor its movement before deciding to cross

45. A pilot must recognize that fog forming in precipitation, often ahead of a warm front, is known as what?

A. Radiation fog, which forms from nighttime cooling of the ground surface

B. Precipitation-induced fog, forming as rain saturates the cooler air below

C. Advection fog, which forms as warm moist air moves over a cold surface

D. Upslope fog, which forms as air is forced up a gradual terrain slope and cools

46. A pilot must understand that the dissipating stage of a thunderstorm is dominated by what?

A. Strong updrafts that continue to build the cell to greater vertical heights

B. Predominant downdrafts throughout the cell as the storm weakens and rains out

C. The formation of new towering cumulus alongside the original cell base

D. A sustained balance of updrafts and downdrafts producing steady heavy rain

47. A pilot must understand that "rime ice" typically forms under what conditions?

A. Large supercooled droplets striking the airframe and freezing slowly and clear

B. Rain falling through a freezing surface layer beneath a warm layer aloft

C. Wet snow accumulating on the leading edges during a slow climb through cloud

D. Small supercooled droplets freezing rapidly, trapping air to form opaque rough ice

48. A pilot must recognize that the air mass behind a cold front is typically what?

A. Cooler, drier, and more stable, often with improving visibility after passage

B. Warmer, moister, and less stable, with deteriorating visibility after passage

C. Identical in temperature and moisture to the air ahead of the front itself

D. Characterized by widespread stratus and continuous drizzle for several days

49. A pilot must understand that the height of the tropopause varies with what?

A. The time of day, being highest at midnight and lowest at noon each day

B. The phase of the moon and its gravitational influence on the atmosphere

C. The barometric pressure setting selected in the aircraft's altimeter window

D. Latitude and season, being higher near the equator and in the summer months

50. A pilot must understand that "convective SIGMETs" are issued for which phenomena?

A. Moderate icing and freezing levels affecting light aircraft along a route

B. Sustained surface winds over 30 knots and moderate non-convective turbulence

C. Severe thunderstorms, embedded storms, lines of storms, and large hail aloft

D. IFR ceilings and visibilities with extensive mountain obscuration enroute

51. A pilot must recognize that wind generally backs (shifts counterclockwise) ahead of what feature in the Northern Hemisphere?

A. A ridge of high pressure building into the region from the west steadily

B. A cold front that has already passed the reporting station to the east

C. A region of clear and stable air within a stationary high-pressure system

D. An approaching warm front, as the wind shifts ahead of the frontal passage

52. A pilot must understand that "haze" reduces visibility primarily by what mechanism?

A. Large water droplets suspended in a saturated air mass near the surface

B. Fine dry particles such as dust or smoke suspended in stable air aloft

C. Heavy precipitation falling continuously from an overcast cloud layer

D. Ice crystals forming in the supercooled air above the freezing level only

53. A pilot must understand that the primary hazard of flying near the top of a building cumulus cloud is what?

A. Reduced engine performance due to the thinner air at the cloud top altitude

B. Loss of radio communication caused by static electricity in the cloud mass

C. Excessive cabin pressurization from the rapid updraft pushing the aircraft up

D. Strong updrafts and turbulence that can carry the aircraft upward rapidly

54. A pilot must understand that an inversion layer often traps what near the surface?

A. Strong vertical wind currents that produce significant convective turbulence

B. Cold dense air that rises rapidly, producing towering cumulus development

C. Clear skies and unlimited visibility with smooth air throughout the layer

D. Pollutants, smoke, and haze, reducing visibility beneath the inversion top

55. A pilot must recognize that the most dangerous condition for low-level wind shear is associated with what?

A. A steady gentle breeze from a single direction during a stable evening period

B. A high-pressure system centered directly over the departure airport at dawn

C. A thunderstorm near the airport producing strong gust fronts and microbursts

D. A light morning fog layer dissipating slowly as the sun warms the surface

56. A pilot must understand that "orographic" lifting refers to what process?

A. Air rising due to surface heating during the warmest part of the afternoon

B. Air being lifted along a frontal boundary where two air masses meet aloft

C. Air being forced upward as it flows over rising mountainous terrain features

D. Air converging horizontally into a low-pressure center and rising vertically

57. A pilot must understand that the most significant icing intensity that requires immediate action is which?

A. Trace icing, where ice becomes perceptible but accumulates very slowly indeed

B. Severe icing, where the rate of accumulation exceeds the anti-ice capability

C. Light icing, where occasional use of deicing equipment manages the situation

D. Moderate icing, where the accumulation is potentially hazardous over time only

58. A pilot must understand that warm front precipitation generally precedes the front and appears how?

A. As a narrow band of intense showers immediately at the frontal boundary line

B. As widespread, steady precipitation extending well ahead of the surface front

C. As scattered afternoon thunderstorms behind the front after it has passed by

D. As clear skies with no precipitation until the front has completely passed over

59. A pilot must understand that the formation of dew or frost on an aircraft overnight indicates what about the air?

A. The air aloft is unstable and likely to produce afternoon thunderstorm activity

B. A strong cold front is approaching the area from the west during the night

C. The wind has been strong and gusty throughout the overnight hours at the field

D. The surface cooled to or below the dew point under clear and calm conditions

60. A pilot must understand that "CAT" (clear air turbulence) is particularly hazardous because it does what?

A. Forms only at low altitudes where recovery altitude is severely limited below

B. Occurs without visual cloud cues, giving the pilot no warning of its presence

C. Is always accompanied by severe icing that compounds the turbulence hazard

D. Can be reliably detected by the aircraft's onboard weather radar in advance

Answer Key

1. A. Temp increases with altitude — A temperature inversion is temperature increasing with altitude rather than the normal decrease.

2. D. Clear, calm, humid night — Radiation fog forms under clear skies, light winds, and high humidity over land at night.

3. D. Large droplets, slow freeze — Clear ice from large supercooled droplets freezing slowly and spreading aft is the most hazardous icing.

4. C. Cumulus, mature, dissipating — The thunderstorm life cycle is cumulus, mature, then dissipating.

5. D. Deviate around — Squall lines often cannot be safely penetrated; deviate around them.

6. D. Jet stream/wind shear — CAT is most commonly associated with the jet stream and strong wind shear at high altitude.

7. A. Stratiform, steady, smooth — Stable air produces stratiform clouds, steady precipitation, smooth air, and often poor visibility.

8. B. Moisture + freezing — Structural icing requires visible moisture and a temperature at or below freezing on the airframe.

9. B. Red line, semicircles — A warm front is a red line with semicircles pointing in the direction of movement.

10. D. Moist air over cold surface — Advection fog forms when moist air moves horizontally over a colder surface and cools to its dew point.

11. C. Frontal/orographic/convective/convergence — Lifting can come from frontal, orographic, convective heating, or convergence mechanisms.

12. B. Approach and departure — Wind shear is most hazardous near the ground at low airspeed during approach and departure.

13. B. Localized downdraft, outflow — A microburst is an intense localized downdraft producing diverging outflow at the surface.

14. A. Near saturation — A small dew point spread indicates air near saturation, favoring clouds or fog.

15. B. At/above freezing level — Ice forms in visible moisture at or above the freezing level where droplets are supercooled.

16. C. Narrow intense band — A cold front produces a narrow band of intense weather with showers, gusty winds, and turbulence.

17. C. About 2°C per 1,000 ft — The standard (ISA) lapse rate is 1.98°C per 1,000 ft (6.5°C per kilometer), conventionally rounded to 2°C per 1,000 ft. The word "closest" in the stem makes C unambiguously correct against the 1°C distractor, which reflects a common confusion with the dewpoint convergence rate rather than the temperature lapse rate.

18. A. Concealed in cloud — Embedded thunderstorms are concealed within other cloud layers and cannot be seen visually.

19. A. Freeze beyond protected areas — SLD can freeze aft of (behind) deicing boots and protected surfaces, a serious hazard.

20. D. Veers clockwise, gusty — In the Northern Hemisphere, wind veers clockwise and becomes gusty with cold front passage.

21. A. Strong perpendicular winds + stable layer — Mountain wave turbulence forms with strong winds perpendicular to a ridge and a stable layer aloft.

22. A. Fog/low cloud likely — Converging temperature and dew point favors fog or low cloud formation.

23. C. Warm layer aloft, freezing below — Freezing rain indicates a warmer layer aloft where rain forms, falling into a freezing layer below.

24. B. Mature stage — The greatest turbulence and hazards occur in the mature stage, with coexisting updrafts and downdrafts.

25. A. Cold overtakes warm — An occluded front forms when a faster cold front overtakes a slower warm front, lifting the warm air aloft.

26. C. A few degrees or less — Fog is most likely when the temperature-dew point spread narrows to a few degrees or less.

27. B. Vertical motion from heating — Convective weather is driven by vertical air movement due to heating and instability.

28. C. Avoidance — Severe icing can exceed any anti-ice capability and must be avoided.

29. C. MVFR 1,000–3,000/3–5 — MVFR is a 1,000–3,000-ft ceiling and 3–5 SM visibility.

30. A. Increases, veers clockwise — With altitude, decreasing friction causes wind to increase and veer clockwise (Northern Hemisphere).

31. D. Precipitation evaporating — Virga is precipitation falling from a cloud that evaporates before reaching the ground.

32. C. Source region — An air mass takes on the characteristics of the surface region over which it forms.

33. A. Freezing rain/inversion — Rain turning to ice on the windscreen indicates freezing rain with a warmer layer aloft (inversion).

34. D. Near tropopause 30–40k — The strongest jet stream winds are near the tropopause, typically 30,000–40,000 ft.

35. A. Clouds/precip along axis — A trough of low pressure is associated with clouds, precipitation, and unsettled weather along its axis.

36. A. Weight/drag up, lift down — Airframe ice increases weight and drag while decreasing lift and the stall margin.

37. B. Actual pilot observations — PIREPs provide actual conditions observed and reported by pilots in flight.

38. D. Moist/dry air masses — A dry line separates a moist air mass from a dry one, often triggering thunderstorms.

39. B. Large abrupt changes — Severe turbulence causes large abrupt changes in altitude/attitude, momentarily out of control.

40. C. Ceiling — The lowest broken or overcast layer constitutes the ceiling.

41. C. Cold air over warm lake — Lake effect snow forms when cold air moves across a warmer lake, picking up moisture and instability.

42. A. 15°C / 59°F — ISA defines a sea-level temperature of 15°C (59°F).

43. A. Inversion/frontal boundary — Clear-air wind shear can occur near a temperature inversion or frontal boundary aloft.

44. C. Avoid by wide margin — The most reliable way to avoid thunderstorm hazards is to avoid the storm entirely by a wide margin.

45. B. Precipitation-induced fog — Fog forming in precipitation ahead of a warm front is precipitation-induced fog.

46. B. Downdrafts dominate — The dissipating stage is dominated by downdrafts as the storm weakens and rains out.

47. D. Small droplets, rapid freeze — Rime ice forms from small supercooled droplets freezing rapidly, trapping air into opaque rough ice.

48. A. Cooler, drier, stable — The air behind a cold front is typically cooler, drier, and more stable with improving visibility.

49. D. Latitude and season — Tropopause height varies with latitude and season, higher near the equator and in summer.

50. C. Severe/embedded/lines/hail — Convective SIGMETs are issued for severe thunderstorms, embedded storms, lines of storms, and large hail.

51. D. Approaching warm front — Wind backs (shifts counterclockwise) ahead of an approaching warm front.

52. B. Fine dry particles — Haze reduces visibility through fine dry particles (dust, smoke) suspended in stable air.

53. D. Strong updrafts/turbulence — Near the top of a building cumulus, strong updrafts and turbulence can carry the aircraft upward rapidly.

54. D. Traps pollutants/haze — An inversion traps pollutants, smoke, and haze near the surface, reducing visibility.

55. C. Thunderstorm gust fronts — The most dangerous low-level wind shear is associated with thunderstorm gust fronts and microbursts.

56. C. Air over terrain — Orographic lifting is air forced upward as it flows over rising terrain.

57. B. Severe icing — Severe icing, where accumulation exceeds anti-ice capability, requires immediate action.

58. B. Widespread, steady, ahead — Warm front precipitation is widespread and steady, extending well ahead of the surface front.

59. D. Cooled to dew point — Dew or frost overnight indicates the surface cooled to or below the dew point under clear, calm conditions.

60. B. No cloud cues — CAT is hazardous because it occurs without visual cloud cues, giving no warning.