DOCUMENT
GSM-AUS-CPL.024

DOCUMENT TITLE

METEOROLOGY FOR AUSTRALIA

CHAPTER 36 – ATPL QUESTIONS

Version 3.0
November 2014

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ATPL METEOROLOGY - PRACTICE QUESTIONS

You have been issued with the following information :

TAF AMD YSSY 170024 30015KT 9999 SCT040 SCT100
FM 08 18018KT 9999 RASH FEWO10 SCT020
FM 14 20012KT
INTER 0410 3000 +TS SCT050CB
22 24 24 21 1012 1010 1008 1008

1. For what period is the forecast valid?
   a. (a) for 24 hours commencing at midnight local time.
   b. (b) for 24 hours commencing at midnight.
   c. (c) for 24 hours commencing at midnight on the 24th.
   d. for 12 hours commencing at midnight on the 24th.

2. During what period does the forecast indicate the possibility of cloud with 1000 feet ceiling at YSSY?
   a. (a) between 0800 and 1000 Z.
   b. (b) between 0800 and 1400 Z.
   c. (c) between 0800 and 1600 Z
   d. (d) between 0800 and 2400 Z.

3. Which statement is incorrect concerning the forecast wind?
   a. at 0500 it will be 300/15 with the chance of short term variations if thunderstorms are present.
   b. at 0800 there will be rapid wind change associated with the arrival of thunderstorms.
   c. at 1200 it will be 180/18.
   d. at 2000 it will be 200/12.

4. For what period of time does a TTF supersede a TAF issued for the same aerodrome?
   a. from the time of issue of the TTF until the end of the TAF validity period.
   b. for the validity period specified in the TTF.
   c. for a period of 3 hours from the time of issue of the TTF.
   d. for a period of 12 hours from the time of issue of the TTF.

5. What datums are used in METARs?

   a. cloud base is height above mean sea level and wind direction is based on true north.

   b. cloud base is height above mean sea level and wind direction is based on magnetic north.

   c. cloud base is height above aerodrome elevation and wind direction is based on true north.

   d. cloud base is height above aerodrome elevation and wind direction is based on magnetic north.

6. You have the following data set from a Grid Point Forecast :

   2405557
   2506554
   2407550
   2507544
   2606530
   2705520

   Regarding this data set, which of the following statements is correct?

   a. the temperature at FL 185 is colder than ISA.

   b. the temperature at FL340 is warmer than ISA.

   c. the temperature at FL380 is colder than ISA.

   d. the temperature at FL445 is warmer than ISA.

7. In the diagram below , which of the following statements is correct concerning the SIGWX PROG?

   a. the jet stream over APPH has an average speed of 220 kt.

   b. the jet stream over APPH has a maximum speed of 220 kt.

   c. the jet stream over AMMB has a maximum speed of 110 kt.

   d. the jet stream over AMMB has an average speed of 110 kt.

8. Which of the following statements is correct concerning the SIGWX PROG?

   a. here are occasional CB with tops to F300 well to the south of APPH.

   b. there are isolated embedded CB with tops to F300 in the vicinity of APAD.

   c. there are isolated embedded CB with tops to F330 in the vicinity of ASSY.

   d. there are isolated embedded CB with tops to F260 over AMHB.

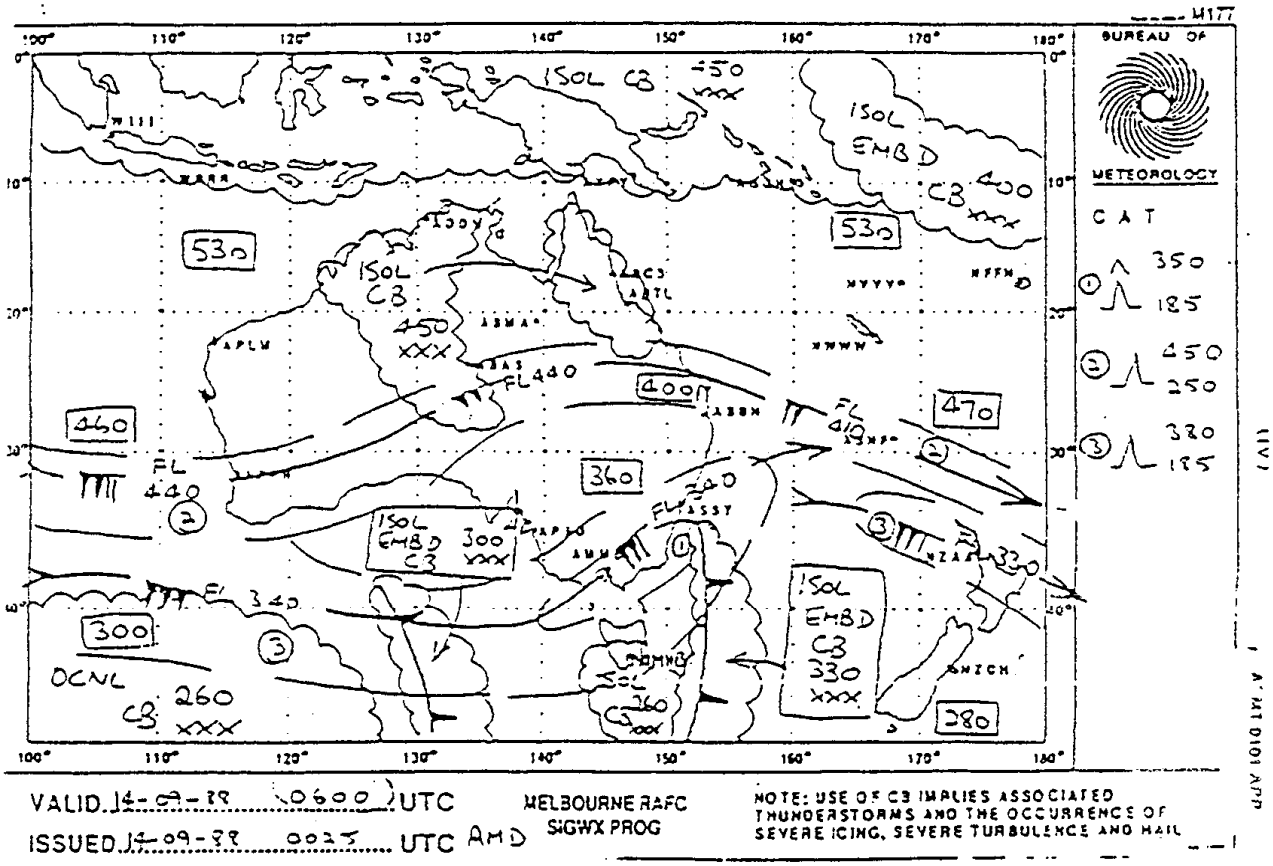
9. Which of the following statements is correct concerning the following SIGWX PROG?

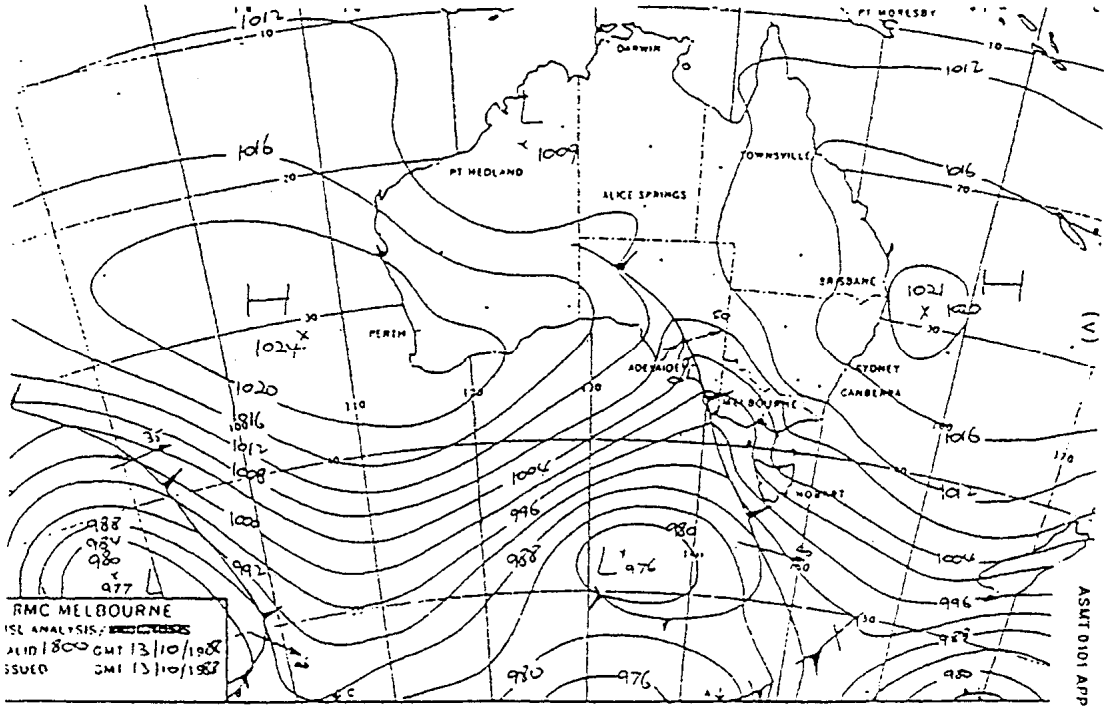
   a. the tropopause is higher over ASNF than over NZCH.

   b. the tropopause is higher over APPH than over ADDN.

   c. there is no CAT forecast above F185 between ABBN and ASSY.

   d. there is severe CAT forecast in the vicinity of APPH.





10. 10. The MSL ANALYSIS on the preceding pages shows a front approaching Bass Strait. Which of the following statements is correct concerning the stream behind the front, in the vicinity of Bass Strait?

a. (a) thunderstorms are unlikely to develop in the stream.

b. (b) thunderstorms are possible in the stream because the stream will bring warm moist air rapidly over a colder sea surface.

c. (c) thunderstorms are possible in the stream because the stream will bring cold moist air rapidly over a warmer sea surface.

d. (d) thunderstorms are possible in the stream because air behind the stream will have been uplifted by the action of the front.

11. Which of the following phenomena is <u>least</u> likely to be associated with a microburst?

a. virga.

b. localised blowing dust at the surface.

c. heavy continuous rain from overcast NS.

d. towering CU.

12. Which of the following conditions are prerequisites for the formation of dust storms?

    a. land surface dry and dusty, strong wind, stable atmosphere.

    b. land surface dry and dusty, wind at least moderate, temperature inversion 5000 feet.

    c. land surface dry and dusty, light wind, temperature inversion below 10000 feet.

    d. land surface dry and dusty, wind at least moderate, unstable atmosphere.

13. Which of the following conditions are most favourable for the formation of radiation fog overnight?

    a. clear sky, low temperature, and low relative humidity.

    b. clear sky, high temperature, low relative humidity.

    c. clear sky, low temperature, and high relative humidity.

    d. high overcast, low temperature, low relative humidity.

14. Lenticular clouds are likely to indicate the presence of :

    a. mountain waves.

    b. mountain wave turbulence.

    c. icing conditions.

    d. a jet stream.

15. A mature thunderstorm is approaching the departure end of the runway in use. Which of the following is likely to present the greatest hazard to a heavy aircraft attempting to take-off?

    a. airframe icing.

    b. turbulence.

    c. lightning.

    d. downdraught.

16. A parcel of moist (saturated) air rises vertically in the atmosphere. Which of the following statements is correct?

    a. it will cool at about 0.5°C per 1000 feet.

    b. it will cool at about 1.5°C per 1000 feet.

    c. it will warm at about 3.0°C per 1000 feet.

    d. it will warm at about 5.0°C per 1000 feet.

17. The atmospheric condition where the DALR is greater than the ELR but the SALR is less than the ELR is known as :

    a. stability.

    b. instability.

    c. conditional instability.

    d. an inversion.

18. Which of the following statements is correct concerning tropical cyclones?

    a. they tend to form over warm seas within 5° of the Equator.

    b. they tend to form over warm seas beyond 5° of the equator.

    c. they tend to form over low-lying land areas adjacent to warm seas within 5° of the Equator.

    d. they tend to form over low-lying land areas adjacent to warm seas beyond 5° of the Equator.

19. A mature cyclone is moving due south in the southern hemisphere. Where is the area of worst weather likely to be located?

    a. in the north-eastern quadrant.

    b. in the south-eastern quadrant.

    c. in the south-western quadrant.

    d. in the north-western quadrant.

20. Clear air turbulence is often associated with jet streams. Which of the following statements is correct concerning the relationship between jet streams and CAT?

    a. the probability of encountering CAT is greatest in the jet core.

    b. the probability of encountering CAT is greatest on the equatorial side of the jet.

    c. the probability of encountering CAT is greatest above the jet.

    d. the probability of encountering CAT is greatest if the jet is curved.

21. Where is the sub-tropical jet stream likely to be located in January?

    a. near latitude 10°S.

    b. near latitude 20°S.

    c. near latitude 30°S.

    d. near latitude 45°S.

22. Which of the following conditions is most favourable for the formation of dust storms in the vicinity of Adelaide?

    a. an approaching cold front with a high pressure area to the east.

    b. a high pressure area over South Australia with a cold front to the east.

    c. a 'col' near Adelaide.

    d. a ridge line passing through Adelaide.

23. Tropical thunderstorms occurring in the hours just before dawn are most likely to form :

    a. over the sea.

    b. over coastal land areas with a tendency to move seawards.

    c. over coastal waters with a tendency to move over land.

    d. over the sea, but at considerable distances from land.

24. The area of maximum horizontal wind shear associated with a jet stream will normally be found :

    a. close to the centre of the jet core.

    b. to the side of the jet core nearest the pole.

    c. to the side of the jet core nearest the equator.

    d. at the boundary which separates the jet stream from the normal westerly flow.

25. Runway Visual Range (RVR) is observed for the take-off and landing direction in use. The point from which this observation would normally be made is :

    a. the touchdown point for the particular runway.

    b. the aerodrome reference point.

    c. the aerodrome control tower.

    d. the point on the approach path to the runway at which the threshold markers or lights will first become visible to the pilot of an aircraft on final approach.

26. What is the extend of coverage of a domestic TAF

    a. it is valid for an area of 5 nm from the centre of the airfield.

    b. it is valid for an area of 5 km from the centre of the airfield.

    c. it is valid for an area of 10 nm from the centre of the airfield.

    d. it is valid for an area of 10 km from the centre of the airfield.

27. Which statement best describes the information contained in a TTF?

    a. it reports current weather conditions at the aerodrome of origin.

    b. it reports current weather conditions at the aerodrome of origin and appends a statement of the trend expected in the next hour.

    c. it reports current weather conditions at the aerodrome or origin and appends a statement of the trend expected in the next three hours.

    d. it reports current weather conditions at the aerodrome of origin and appends a statement of the trend expected in the next six hours.

28. Which statement is correct regarding the meaning of the term CAVOK in respect of visibility at an aerodrome?

    a. visibility is 10 km or more.

    b. visibility is 10 km or more with no shallow fog.

    c. visibility is 10 km or more over the whole horizon with no shallow fog.

    d. visibility is 10 km or more over at least half the horizon, with no shallow fog.

29. With reference to the TAF below, which of the following conditions are forecast to occur at 0800 UTC.

    **YSSY 280024 16012KT 9999 RASH FEW008 BKN025 **
    PROB 10 INTER 0006 5000 TS SCT040CB
    T 22 24 26 21 Q 1020 1021 1022 1025

    a. the visibility is 9999 m, with 1-2 oktas at 800 feet.

    b. probability of thunderstorms with 3-4 oktas CB at 4000 feet.

    c. rain showers from cumulus type with a base of 2500 feet,.

    d. visibility 10 km or greater reducing to 5 000 m for periods up to 30 minutes.

30. Which statement correctly describes the presentation of information in a METAR?

    a. height of the cloud base is expressed as a three-figure group.

    b. height of Cumulus cloud is expressed as a six-figure group giving the height of both base and tops.

    c. wind speed is expressed as a five-figure group.

    d. the period of validity is expressed as a four-figure group.

31. The following data set is taken from a GPWT forecast.

3308062
3308064
3306646
3305038
3502521
0101009

Which information is included in the data set?

a. At FL385 the wind is 33 kt from 080, with an OAT of -64°C.

b. At FL385 the wind is 80 kt from 033, with an OAT of -54°C.

c. At FL300 the wind is 50 kt from 330, with an OAT of -38°C.

d. At FL300 the wind is 38 kt from 050, with an OAT of -33°C.

32. The tropopause is a significant boundary in the atmosphere. What is its significance?

a. it is the division between an atmospheric layer in which temperature generally falls steadily with increasing altitude, and a layer in which temperature generally remains constant or increases with increasing altitude.

b. it is the division between two atmospheric layers where the temperature immediately above the division is higher than the temperature immediately below the division.

c. it marks the lowest altitude at which jet streams can be encountered in that vicinity.

d. it marks the highest altitude to which cloud development can take place in that vicinity.

33. Clear air turbulence (CAT) can occur in widely different circumstances, but nevertheless there are some features which generally hold true. Which of the following is generally true?

a. CAT occurs more frequently over water than over land.

b. there will probably be a jet stream in the vicinity if CAT is encountered.

c. the existence of contrails indicates an increased probability of CAT.

d. if CAT is encountered, a 3000 feet descent is likely to be sufficient to leave the area of CAT.

34. Most jet streams are aligned roughly east-west. If CAT is encountered in association with such a jet stream, where is the area of maximum turbulence likely to be found in relation to the jet stream core?

    a. above it and on the equatorial side.

    b. below it and on the equatorial side.

    c. above it and on the polar side.

    d. below it and on the polar side.

35. Thunderstorms occur in two fundamental types - frontal and air mass. Which of the following statements correctly describes differences between frontal and air mass thunderstorms?

    a. air mass storms are more widely spaced than frontal storms, and have lower bases.

    b. strong downdraughts close to the ground are more likely to be found beneath frontal storms.

    c. an individual frontal storm is likely to be less severe than an air mass storm.

    d. hail is more likely to be encountered in an air mass storm than in a frontal storm.

36. Which of the following sets of conditions presents the greatest threat of airframe ice forming rapidly?

    a. take-off in light fog or mist, with air temperature 0°C.

    b. descent in light drizzle below solid stratus with air temperature -5°C.

    c. cruise penetration of cumulus with air temperature -15°C.

    d. cruise penetration of cumulonimbus with air temperature -5°C.

37. Which of the following terms most correctly describes an accumulation of airframe icing on an aircraft, sufficient to cause a minor reduction in airspeed and to make a change in altitude desirable.

    a. no significant icing.

    b. light icing.

    c. moderate icing.

    d. severe icing.

38. Which of the following statements best describes conditions on board an airline transport passenger aircraft encountering moderate turbulence?

    a. there is discernible aircraft movement but the seat belt sign remains off and normal cabin service continues.

    b. there is noticeable aircraft movement and the seat belt sign is on. Normal cabin service continues but the attendants have to exercise caution. Coffee spills from cups.

    c. the aircraft rolls and pitches sharply at frequent but irregular intervals. Cabin service is suspended because the attendants have difficulty walking about the cabin.

    d. The aircraft moves so sharply that passengers are lifted against their seat belts. Loose objects in the cabin are thrown about.

39. The visibility at an aerodrome is reported as 800 RVR. As you pass vertically above the field at 300 feet you can clearly see the runway below. You make an ILS approach using a standard three degree glideslope. At about what distance from the threshold should you expect to first glimpse the runway?

    a. 1 nm (i.e. about 300 feet on final).

    b. 3/4 run (i.e. about 250 feet on final).

    c. 1/2 nm (i.e. about 180 feet on final).

    d. 1/4 nm (i.e. about 120 feet on final).

40. Which set of conditions would be most favourable for the formation of a thick radiation fog overnight?

    a. clear sky, temperature close to 0°C, calm.

    b. high overcast, high relative humidity, light wind.

    c. clear sky, high relative humidity, and light wind.

    d. clear sky, high relative humidity, calm.

41. Which conditions would be most favourable for the formation of sea fog?

    a. air flow from an area of warm water to an area of colder water.

    b. air flow from a warm land mass to an area of cold water.

    c. air flow from an area of warm water to a cold land mass.

    d. a calm clear night at sea.

42. Which conditions would be most favourable for the formation of a low level jet stream across southern Queensland?

    a. late afternoon, clear sky, a HIGH centered to the east of the Great Dividing Range.

    b. late evening, high overcast, a LOW centered to the east of the Great Dividing Range.

    c. early morning, clear sky, a HIGH centered to the west of the Great Dividing Range.

    d. midday, towering cumulus beginning to develop, a LOW centered to the east of the Great Dividing Range.

43. Which of the following statements gives a set of atmospheric conditions required for the formation of thunderstorms?

    a. unstable atmosphere, some form of lifting mechanism and abundant moisture in the lower layers of the atmosphere.

    b. unstable atmosphere, some form of lifting mechanism and abundant moisture to a considerable depth in the atmosphere.

    c. conditionally unstable atmosphere, some form of lifting mechanism and abundant moisture in the lower layers of the atmosphere.

    d. stable atmosphere, some form of lifting mechanism and abundant moisture to a considerable depth in the atmosphere.

44. In the diagram below : What is the speed of the jet stream between APPH and APAD as shown on the SIGWX PROG below?

    a. it has an average speed of 120 kt

    b. it has an average seed of 220 kt

    c. it has a maximum speed of 120 kt

    d. has a maximum speed of 220 kt.

45. From examination of the SIGWX PROG on the previous page, what conditions are likely to be encountered between ABBN and ASSY?

    a. moderate CAT between FLs 200-500, severe CAT between FLs 300-400, isolated CB with tops F1400.

    b. severe CAT between FLs 200-500, occasional CB with tops FL400.

    c. moderate CAT between FLs 200-500, isolated embedded CB with tops FL380.

    d. severe CAT between FLs 300-400, frequent CB with tops FL450.

46. During a stable approach to land, you encounter sudden difficulty maintaining the desired glideslope and you need to use unusually large variations of power to hold the airspeed within acceptable limits. The type of windshear encountered would be described as :-

    a. light.

    b. moderate.

    c. strong.

    d. severe.

47. A pilot who encounters certain intensities of windshear at an uncontrolled aerodrome, is obliged to broadcast details of the encounter to 'all aircraft'. What details should be included?

    a. aerodrome, altitude of onset, and speed loss.

    b. aerodrome, altitude of onset, and altitude of greatest adverse effect.

    c. aerodrome, type and degree of shear, and altitude of onset.

    d. aerodrome, type and degree of shear, and altitude of greatest adverse effect.

48. What datums are used in aerodrome forecasts?

    a. cloud base is height above mean sea level and wind direction is based on true north.

    b. cloud base is height above mean sea level and wind direction is based on magnetic north.

    c. (c) cloud base is height above aerodrome elevation and wind direction is based on true north.

    d. (d) cloud base is height above aerodrome elevation and wind direction is based on magnetic north.

49. What is the meaning of the term 'dry adiabatic lapse rate'?

    a. the rate at which the temperature of completely dry air changes as a parcel of air ascends or descends through the atmosphere. It is approximately 3°C per 1000 feet.

    b. the rate at which the temperature of unsaturated air changes as a parcel of air ascends or descends through the atmosphere. It is approximately 3°C per 1000 feet.

    c. the rate at which the temperature of completely dry air changes as a parcel of air ascends or descends through the atmosphere. It is approximately 1.5°C per 1000 feet.

    d. (d) the rate at which the temperature of unsaturated air changes as a parcel of air ascends or descends through the atmosphere. It is approximately 1.5°C per 1000 feet.

50. You depart an aerodrome with your aircraft altimeter accurately set to the QNH. You observe that the aircraft is experiencing left drift. What will be the effect on the altimeter reading, assuming that the QNH setting is not changed?

    a. the aircraft is flying towards an area of higher pressure and the altimeter will under-read.

    b. the aircraft is flying towards an area of higher pressure and the altimeter will over-read.

    c. the aircraft is flying towards an area of lower pressure and the altimeter will under-read.

    d. the aircraft is flying towards an area of lower pressure and the altimeter will over-read.

51. The speed of a jet stream shown on a SIGWX PROG chart indicates :

    a. the average speed of the jet core.

    b. the maximum speed of the jet core.

    c. the mean speed of the jet stream.

    d. the maximum speed on the grid point forecast.

52. Microburst - typical characteristics :

    i. Horizontal Dimensions

        a. less than to 4 km.

        b. 5 to 10 km.

        c. 10 to 15 km.

    ii. Lifespan

        a. 10 to 15 minutes.

        b. 15 to 30 minutes.

        c. 30 to 60 minutes.

    iii. Horizontal Windshear

        a. approximately 20 kt.

        b. approximately 50 kt.

        c. approximately 100 kt.

Questions 53-62 may have more than one correct answer

53. From the list below select situations which could indicate, or result in, a microburst.

    a. localised blowing dust near the surface.

    b. towering cumulus.

    c. mild day with overcast stratocumulus cloud.

    d. cloud free, cool afternoon over dusty country.

    e. light continuous rain with overcast altostratus.

    f. presence of virga.

54. Select mean sea level synoptic situations which may result in dust storms or dust devils over South Australia (near Adelaide).

    a. an approaching cold front with a high pressure to the east.

    b. a high over South Australia with a cold front to the east.

    c. a ridge line passing through Adelaide.

    d. a col over South Australia.

    e. an active trough.

55. From the lists below, select typically prevailing conditions during winter along the Eastern coastal regions of North Queensland.

    i. Wind Direction.

        a. S.E.

        b. W.

        c. NW.

    ii. Cloud and weather phenomena.

        a. Cu and early morning showers.

        b. Cb with afternoon showers.

        c. persistent steady winds.

        d. mountain waves.

        e. frontal systems.

56. Select correct statements regarding high level jet streams in the Southern Hemisphere.

    a. the polar jet stream is usually stronger than the sub-tropical jet.

    b. the magnitude of wind shear is greater on the polar side than on the equatorial side of the jet core.

    c. contrails are usually an indication of the presence of a jet stream.

    d. long parallel bands of cirrus cloud often indicate the presence of a jet stream.

    e. CAT is most severe when flying within the jet core.

    f. both polar and sub-tropical jet streams are associated with fronts in the lower troposphere.

57. In January, the sub tropical jet stream is located at an average position near latitude:

    a. 10°S.

    b. 20°S.

    c. 30°S.

    d. 45°S.

58. Which of the following changes in weather are likely to cause coastal fog in Southern Victoria to dissipate :

    a. an increase in middle level cloud.

    b. the approach of a cold front.

    c. wind direction change to S.E.

    d. a marked increase in wind speed.

59. Thunderstorms are observed over the land in the vicinity of Adelaide on a winter afternoon. Select trigger mechanisms which may be responsible for the development of the thunderstorms :

    a. convection.

    b. cold stream.

    c. nocturnal equatorial.

    d. subsidence inversion.

    e. frontal.

60. When would you expect low level jets to attain their maximum speed?

    a. early morning.

    b. midday.

    c. dusk.

    d. midnight.

61. Which items are usually indicative of a stable atmospheric layer?

    a. lenticular cloud.

    b. OAT decreasing rapidly with altitude.

    c. dust devils.

    d. (d) heavy dew.

    e. (e) surface inversion.

    f. (f) layer above fair weather cumulus.

62. Select the correct statements relating to upper level phenomena in the Southern hemisphere

    a. In mid-latitudes the mean height of the tropopause is lower in winter than i summer.

    b. Temperatures at the tropical tropopause are higher than temperatures at the mid-latitude tropopause.

    c. CAT is more likely to be encountered below and to the "poleward" side of a jet stream.

    d. The magnitude of windshear is greater on the "equatorial" side of a jet stream the on the polar side.

    e. Upper level CAT is typically 2000 feet thick.

    f. Exhaust trails are indicative of CAT.

    g. Rapid changes in horizontal temperature are often indicative of the presence of a jetstream.

    h. Easterly wind speeds generally increase with height up to the tropopause and the decrease.

63. The Polar front jet is usually found in association with:

    a. Polar Fronts

    b. Polar zones in summer

    c. Polar zones in winter

    d. Polar tropopause

64. The feature usually associated with the tropopause is:

    a. It is isothermal at all latitudes

    b. There are abrupt changes in the temperature lapse rate

    c. It is the absolute limit of upper cloud development

    d. It is at a constant height above the earth

65. The type of inversion found at the lowest height is:

    a. Frontal

    b. Turbulence

    c. Radiation

    d. Subsidence

ANSWERS