Ground School Exam No. 2

- Topics:
  - Aircraft performance, weight, and balance
  - Weather theory
  - Weather services
  - Cross country flight planning and navigation
  - Aeromedical factors

1. What are the standard temperature and pressure values for sea level?
   a. 15°C and 29.92 inHg
   b. 59°C and 1013.2 millibars
   c. 59°F and 29.92 millibars

2. What effect does high density altitude have on performance?
   a. It increases engine performance
   b. It decreases climb performance
   c. It increases takeoff performance

3. A pilot and two passengers landed on a 2,100 foot east-west gravel strip with an elevation of 1,800 feet. The temperature is warmer than expected and after computing density altitude it is determined the takeoff distance over a 50 foot obstacle is 1,980 feet. The airplane is 75 pounds under gross weight. What would be the best choice?
   a. Takeoff to the west because the headwind will give the extra climb-out time needed
   b. Try a takeoff without passengers to make sure the climb is adequate
   c. Wait until the temperature decreases, and recalculate the takeoff performance

4. Determine the density altitude for these conditions: Altimeter setting 29.95 inHG, Runway temperature 81°F, Airport elevation 5250ft MSL.
   a. 4600 feet MSL
   b. 5877 feet MSL
   c. 8500 feet MSL

5. Determine the ground roll distance required for takeoff: OAT 100°F, Press altitude 2000ft, Takeoff weight 2750 lbs, Headwind comp Calm
   a. 1150 feet
   b. 1300 feet
   c. 1800 feet

6. What is the headwind component for a landing on runway 18 if the tower reports the wind as 220° at 30 knots?
   a. 19 knots
   b. 23 knots
   c. 26 knots

7. What items are included in the empty weight of an aircraft?
   a. Unuseable fuel and undrainable oil
   b.

c. Only the airframe, powerplant, and optional equipment
d. Full fuel tanks and engine oil to capacity

8. An aircraft is loaded 110 pounds over maximum gross weight. If fuel is drained to bring the aircraft weight within limits, how much fuel should be drained?
   a. 15.7 gallons
   b. 16.2 gallons
   c. 18.4 gallons

9. Refer to fig 35 below. What is the expected fuel consumption for a 1,000 nautical mile flight under the following conditions?

   a. 60.2 gallons
   b. 70.1 gallons
   c. 73.2 gallons

   Pressure altitude ..... 8,000 ft
   Temperature..... 22°C
   Manifold pressure .....20.8 inHg
   Wind .....Calm

FIGURE 35.—Airplane Power Setting Table.

Cruise power settings
65% Maximum continuous power (or full throttle 2,800 pounds)

Press ALT.	ISA −20 °C (−36 °F)								Standard day (ISA)								ISA +20 °C (+36 °F)							
	IOAT		Engine speed	MAN. press	Fuel flow per engine		TAS		IOAT		Engine speed	MAN. press	Fuel flow per engine		TAS		IOAT		Engine speed	MAN. press	Fuel flow per engine		TAS	
Feet	°F	°C	RPM	IN HG	PSI	GPH	KTS	MPH	°F	°C	RPM	IN HG	PSI	GPH	KTS	MPH	°F	°C	RPM	IN HG	PSI	GPH	KTS	MPH
SL	27	−3	2,450	20.7	6.6	11.5	147	169	63	17	2,450	21.2	6.6	11.5	150	173	99	37	2,450	21.8	6.6	11.5	153	176
2,000	19	−7	2,450	20.4	6.6	11.5	149	171	55	13	2,450	21.0	6.6	11.5	153	176	91	33	2,450	21.5	6.6	11.5	156	180
4,000	12	−11	2,450	20.1	6.6	11.5	152	175	48	9	2,450	20.7	6.6	11.5	156	180	84	29	2,450	21.3	6.6	11.5	159	183
6,000	5	−15	2,450	19.8	6.6	11.5	155	178	41	5	2,450	20.4	6.6	11.5	158	182	79	26	2,450	21.0	6.6	11.5	161	185
8,000	−2	−19	2,450	19.5	6.6	11.5	157	181	36	2	2,450	20.2	6.6	11.5	161	185	72	22	2,450	20.8	6.6	11.5	164	189
10,000	−8	−22	2,450	19.2	6.6	11.5	160	184	28	−2	2,450	19.9	6.6	11.5	163	188	64	18	2,450	20.3	6.5	11.4	166	191
12,000	−15	−26	2,450	18.8	6.4	11.5	162	186	21	−6	2,450	18.8	6.1	10.9	163	188	57	14	2,450	18.8	5.9	10.6	163	188
14,000	−22	−30	2,450	17.4	5.8	10.5	159	183	14	−10	2,450	17.4	5.6	10.1	160	184	50	10	2,450	17.4	5.4	9.8	160	184
16,000	−29	−34	2,450	16.1	5.3	9.7	156	180	7	−14	2,450	16.1	5.1	9.4	156	180	43	6	2,450	16.1	4.9	9.1	155	178

Note: 1. Full throttle manifold pressure settings are approximate.
2. Shaded area represents operation with full throttle.

10. Refer to fig 38 below. Determine the total distance to land.

    a. 850 feet
    b. 1400 feet
    c. 1750 feet

OAT ..... 32°C
Pressure altitude ..... 8,000 ft
Weight 2600lbs
Headwind comp ..... 20 kts
Obstacle..... 50 ft

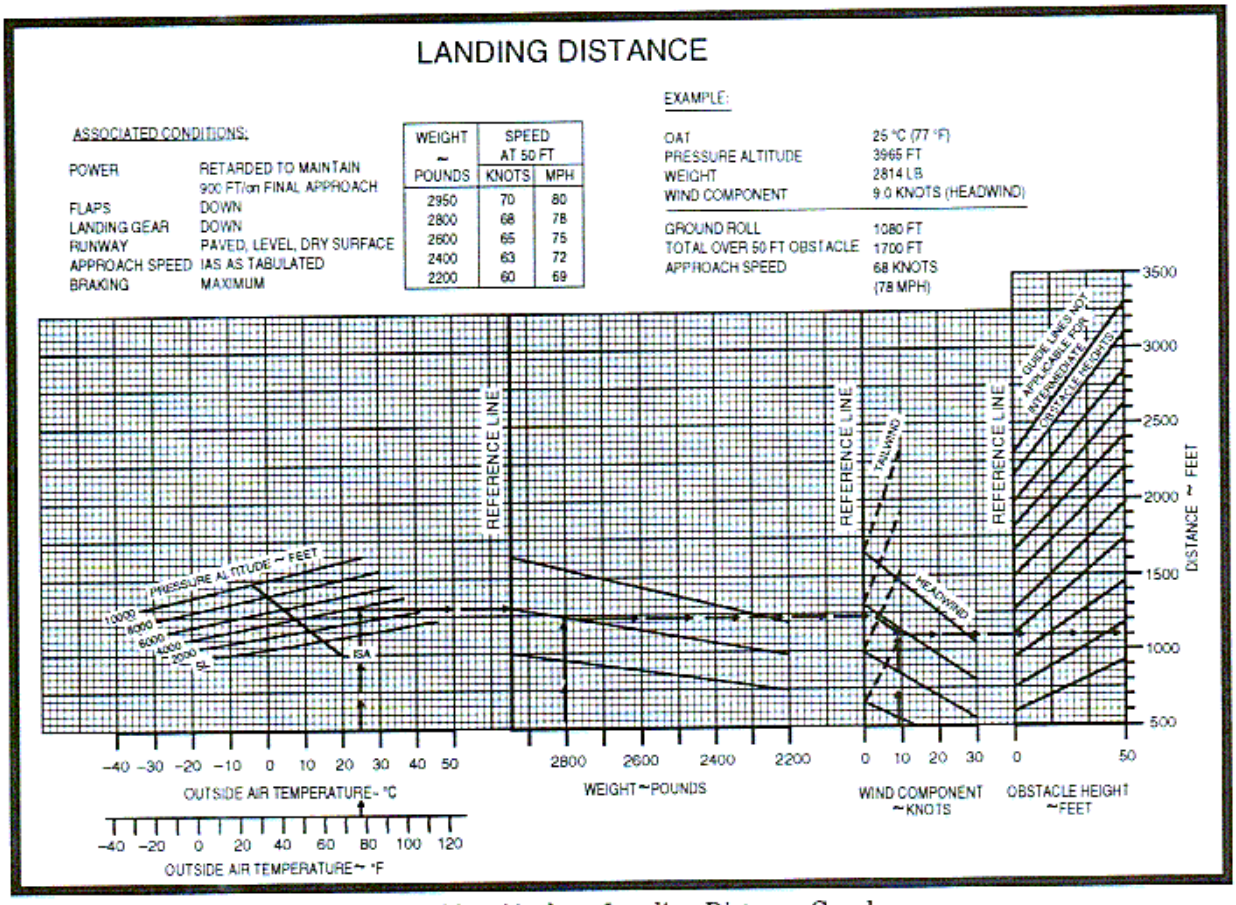

FIGURE 38.—Airplane Landing Distance Graph.

11. If an emergency situation requires a downwind landing, the pilot should expect a faster
    a. Airspeed at touchdown, a longer ground roll, and better control throughout the landing roll
    b. Groundspeed at touchdown, a longer ground roll, and the likelihood of overshooting the desired touchdown point
    c. Groundspeed at touchdown, a shorter ground roll, and the likelihood of undershooting the desired touchdown point

12. As a result of weight and balance, an aft loaded aircraft may
    a. Be more stable at all airspeeds, and in the event of a stall recovery will be easier
    b. Be less stable at all airspeeds, and in the event of a stall may have difficulty recovering
    c. Be more easily controlled at slow airspeeds, and in the event of a stall the aircraft will recover normally

13. Which statement best defines hypoxia?
    a. A state of oxygen deficiency in the body
    b. An abnormal increase in the volume of air breathed
    c. A condition of gas bubble formation around the joints or muscles

14. A pilot should be able to overcome the symptoms or avoid future occurrences of hyperventilation by
    a. Closely monitoring the flight instruments to control the airplane
    b. Slowing the breathing rate, breathing into a bag, or talking aloud
    c. Increasing the breathing rate in order to increase lung ventilation

15. Pilots are more subject to spatial disorientation if
    a. They ignore the sensations of muscles and inner ear
    b. Visual cues are taken away, as they are instrument meteorological conditions (IMC)
    c. Eyes are moved often in the process of cross-checking the flight instruments

16. What effect does haze have on the ability to see traffic or terrain features during flight?
    a. Haze causes the eyes to focus at infinity
    b. The eyes tend to overwork in haze and do not detect relative movement easily
    c. All traffic or terrain features appear to be farther away than their actual distance

17. Effects of carbon monoxide poisoning include
    a. Dizziness, blurred vision, and loss of muscle power
    b. Sweating increased breathing, and paleness
    c. Motion sickness, tightness across the forehead, and drowsiness

18. What is one of the neglected items when a pilot relies on short and long term memory fr repetitive tasks
    a. Checklists
    b. Situational awareness
    c. Flying outside the envelope

19. In the aeronautical decision making (ADM) process, what is the first step in neutralizing a hazardous attitude?
    a. Recognizing hazardous thoughts
    b. Recognizing the invulnerability of the situation
    c. Making a rational judgment

20. Every physical process of weather is accompanied by, or is the result of, a
    a. Movement of air
    b. Pressure differential
    c. Heat exchange

21. The wind at 5,000 AGL is southwesterly while the surface wind is southerly. This difference in direction is primarily due to
    a. Stronger pressure gradient at higher altitudes
    b. Friction between the wind and the surface
    c. Stronger Coriolis force at the surface

22. The boundary between two different air masses is referred to as a
    a. Frontolysis
    b. Frontogenesis
    c. Front

23. If there is a thunderstorm in the vicinity of an airport at which you will operate, which azardous atmospheric phenomenon might be expected on the landing approach?
    a. Precipitation static
    b. Wind-shear turbulence
    c. Steady rain

24. What conditions are necessary for formation of a thunderstorm?
    a. High humidity, lifting force, and unstable air
    b. High humidity, high temperature, and cumulus clouds
    c. Lifting force, moist air, and extensive cloud cover

25. The conditions necessary for the formation of ice on an aircraft are
    a. A small temperature and dew point spread
    b. Freezing temperatures and a high dew point
    c. Freezing temperatures and visible moisture

26. Crests of mountain waves may be marked by stationary, lens shaped clouds known as
    a. Mammatocumulus clouds
    b. Standing lenticular clouds
    c. Roll clouds

27. Where does wind shear occur?
    a. At all altitudes, in all directions
    b. Only at higher altitudes
    c. Only at lower altitudes

28. Clouds, fog, or dew will always form when
    a. Water vapor condenses
    b. Water vapor is present
    c. Relative humidity reaches 100 percent

29. Which clouds have the greatest turbulence?
    a. Towering cumulus
    b. Cumulonimbus
    c. Nimbostratus

30. What are characteristics of unstable air?
    a. Turbulence and good surface visibility
    b. Turbulence and poor surface visibility
    c. Nimbostratus clouds and good surface visibility

31. When there is a temperature inversion you would expect to experience
    a. Clouds with extensive vertical development
    b. Good visibility in the lower levels of the atmosphere and poor visibility above an inversion aloft
    c. An increase in temperature as altitude increases

32. To get a complete weather briefing for the planned flight the pilot should request
    a. A standard briefing
    b. An abbreviated briefing
    c. A general briefing

33. For aviation purposes, ceiling is defined as the height above the earth's surface of the
    a. Lowest reported obscuration and the highest layer of clouds reported as overcast
    b. Lowest broken or overcast layer or vertical visibility into an obscuration
    c. Lowest layer of clouds reported as scattered, broken, or thin

34. Refer to the following METAR, what are the wind conditions?
    a. Calm
    b. 110° at 12 knots, gusts to 18 knots
    c. 111° at 2 knots, gusts 18 knots

35. Refer to the METAR above. The remarks section for KMDW shows RAB35. This entry means
    a. Blowing mist has reduced the visibility to 1 1/12 SM
    b. Rain began at 1835Z
    c. The barometer has risen .35 in HG

36. To best determine general forecast weather conditions covering a flight information region, the pilot should refer to
    a. Aviation area forecasts
    b. Weather depiction charts
    c. Satellite maps

37. Refer to the TAF below. What is the forecast wind for KMEM from 1600Z until the end of the forecast?
    a. No significant wind
    b. Variable in direction at 6 knots
    c. Variable in direction at 4 knots

TAF

KMEM 121720Z 1218/1324 20012KT 5SM HZ BKN030 PROB40 2022 1SM TSRA OVC008CB
FM2200 33015G20KT P6SM BKN015 OVC025 PROB40 2202 3SM SHRA
FM0200 35012KT OVC008 PROB40 0205 2SM-RASN BECMG 0608 02008KT BKN012
BECMG 1310/1312 00000KT 3SM BR SKC TEMPO 1212/1214 1/2SM FG
FM131600 VRB06KT P6SM SKC=

KOKC 051130Z 0512/0618 14008KT 5SM BR BKN030 TEMPO 0513/0516 1 1/2SM BR
FM051600 18010KT P6SM SKC BECMG 0522/0524 20013G20KT 4SM SHRA OVC020
PROB40 0600/0606 2SM TSRA OVC008CB BECMG 0606/0608 21015KT P6SM SCT040=

38. Refer to the TAF above. In the forecast for KOKC, what should the forecast winds between the hours of 1600Z and 2200Z?
    a. 160° at 10 knots
    b. 180° at 10 knots
    c. 180° at 10 knots becoming 200° at 13 knots

39. A flag symbol on a sectional chart represents?
    a. A VFR reporting checkpoint
    b. A flight service station
    c. A weather balloon launching position

40. When a tower is denoted on a sectional
    a. The first number is the altitude at the top of the tower and the number in parenthesis is the height of the tower
    b. Blue towers are radio towers and red towers are lighted towers
    c. The tallest tower will always be denoted by the letters “UC”

41. Refer to the airport data block below. What is the identifier for the airport?
    a. WDG
    b. CT
    c. RP

ENID WOODRING RGNL (WDG)
CT – 118.9 * ©
AWOS-3 120.625
1167 *L 86 122.9
RP 31, 35

42. Refer to the airport data block above. When the tower closes, what frequency would be used to announced position and intentions to other traffic?
    a. 118.9
    b. 120.625
    c. 122.9

43. Refer to the airport data block above. What is the length of the runway at Enig regional Airport?
    a. 1167 ft
    b. 8600 ft
    c. 3500 ft with 3100 ft useable for landing

44. Refer to the airport data block above. What does the “RP 31, 35” mean?
    a. The longest runway is 3500 feet long, but only 3100 feet is available for use
    b. The traffic pattern for runways 31 and 35 is non-standard
    c. Regional procedures 31 and 35 are in use when approaching this airport

45. When approaching a radar controlled airport while on a cross country flight, the pilot should
    a. Establish radio communications when the aircraft is over a prominent checkpoint approximately 20 miles away
    b. Approach the airport cautiously and request a clearance at least 5 NM prior to entering controlled airspace
    c. Squawk 7500 prior to entering controlled airspace and then establish and maintain two way communications on the appropriate frequency