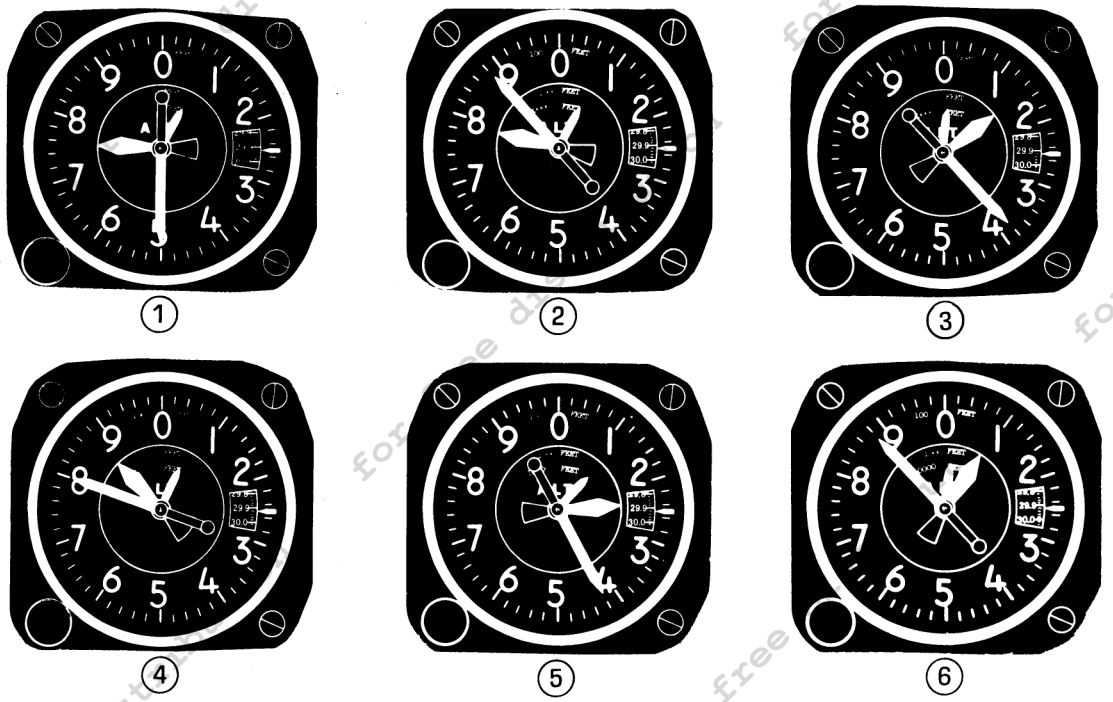
U.S. DEPARTMENT OF TRANSPORTATION
Federal Aviation Administration

VFR PILOT EXAM-O-GRAM* NO. 9

ALTIMETRY

Your altimeter is a vitally important instrument. You will agree that flight without this instrument would indeed be a haphazard undertaking -- yet, HOW WELL DO YOU KNOW YOUR ALTIMETER? Take this short quiz on altimetry; then check the answers and explanations provided.

1. Check your ability to quickly interpret the altitude by jotting down the readings of the following 6 altimeters. Allow yourself 1 minute.



2. Federal Aviation Regulations require that you maintain specific cruising altitudes (VFR as well as IFR) by reference to an altimeter. What do regulations require concerning the setting (or adjustment) of an altimeter?

3. If flying in very cold air (colder than standard temperatures), you should expect the altimeter to read which of the following?

   (a) higher than your actual altitude above sea level.
   (b) lower than your actual altitude above sea level.
   (c) the same as your actual altitude above sea level.

4. Here are 4 altitudes with which you should be familiar. Briefly give the meaning of each. (1) Indicated altitude. (2) Pressure altitude. (3) Density altitude. (4) True altitude.

5. Assume that your proposed route crosses mountains with peaks extending to 10,900 feet above sea level. Prior to crossing this range, you adjust the altimeter setting window of the altimeter to the current altimeter setting reported by a Flight Service Station located in a valley near the base of this mountain range. If you maintain an indicated altitude of 11,500 feet, can you be assured of at least 500 feet clearance above these mountain peaks?

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NOTE: Answers and explanations to the above questions are on the reverse side of this page.

* Exam-O-Grams are non-directive in nature and are issued solely as an information service to individuals interested in Airman Written Examinations.

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ANSWERS TO QUESTIONS ON ALTIMETRY

1. (1) 7,500 ft. (2) 7,880 ft. (3) 1,380 ft. (4) 8,800 ft. (5) 12,420 ft. (6) 880 ft.

   If your altimeter is the three-pointer-type sensitive altimeter such as those pictured on the reverse side of this sheet, an orderly approach to reading the altitude is to first note the position of the smallest hand (10,000-ft. hand) to see if it is more or less than 10,000 ft.; next read the middle hand (1,000-ft. hand); and then, read the large hand (100-ft. hand). For the two-pointer altimeter, simply read the small hand first and the large hand next.

2. The altimeter should be set to the current reported altimeter setting of a station along the route of flight (Flight Service Stations, Control Towers, etc.). If your aircraft is not equipped with a radio, you should obtain an altimeter setting prior to departure if one is available, or you should adjust the altimeter to the elevation of the departure airport.

3. If flying in cold air, you should expect the altimeter to indicate HIGHER than you actually are. There is an old saying -- one well worth remembering -- "WHEN FLYING FROM A HIGH TO A LOW OR HOT TO COLD, LOOK OUT BELOW!" In other words, if flying from a high pressure area to a low pressure area or into colder air, be careful because you probably aren't as high as you think -- assuming, of course, that no compensations are made for these atmospheric conditions.

4. (1) INDICATED ALTITUDE--That altitude shown on the altimeter (uncorrected for temperature).
   (2) PRESSURE ALTITUDE--The altitude indicated after the altimeter setting window is adjusted to 29.92. This altitude is used in computing density altitude, true altitude, true airspeed, etc.
   (3) DENSITY ALTITUDE--This altitude is pressure altitude corrected for nonstandard temperature variations. It is important because this altitude is directly related to the aircraft's takeoff and climb performance.
   (4) TRUE ALTITUDE--The true height of the aircraft above sea level - the actual altitude. Often you will see a true altitude expressed as: "10,900 ft. MSL"--the MSL standing for MEAN SEA LEVEL. Remember that airport, terrain, and obstacle elevations found on charts and maps are true altitudes.

5. NO, you are not assured of 500 feet clearance above these mountains. As a matter of fact, with certain atmospheric conditions, you might very well be 500 feet BELOW the peaks with this indicated altitude. To begin with, 500 feet is hardly an adequate separation margin to allow on flights over mountainous terrain -- 1,500 to 2,000 feet is recommended to allow for possible altitude errors and downdrafts.

   A majority of pilots confidently expect that the current altimeter setting will compensate for irregularities in atmospheric pressure. Unfortunately, this is not always true. Remember that the altimeter setting broadcast by ground stations is the station pressure corrected to Mean Sea Level. It does not compensate for the effect of nonstandard temperature or pressure variations.

   When flying over mountainous country, allow yourself a generous margin for terrain and obstacle clearances.

KNOW YOUR ALTIMETER

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Federal Aviation Administration
Flight Standards National Field Office
Examinations Branch
P.O. Box 25082
Oklahoma City, Oklahoma 73125

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