

**NAVIGATION part 2.**

Assume through out that magnetic variation is 5 degrees west and 1mb = 30 ft.

You require a pen, ruler, protractor and a copy of the ICAO 1:500 000 scale aeronautical chart *SOUTHERN ENGLAND AND WALES*.

1. The task is an out and return from Lasham. Draw a line on your map from Lasham (N 51-11.359. W 001-01.899) to Didcot power station (N 51-37.297. W 001-15.658).

QUESTION 1. What is the out bound true track and the return magnetic track?

- A. 342 T and 167 M.
- B. 337 T and 162 M.
- C. 347 T and 167 M.
- D. 347 T and 162 M.

QUESTION 2. Just south of Didcot is an area marked P106/2.5. What rules apply to a glider when flying in the vicinity of this area?

- A. The glider may fly overhead at greater than FL 2.5.
- B. The glider may fly overhead at greater than 2500 ft above mean sea level.
- C. The glider may fly overhead at greater than 2500 ft above ground level.
- D. The glider is prohibited from overflying the area.

QUESTION 3. What is the approximate distance of each leg?

- A. 32 nautical miles or 50 kilometres.
- B. 32 nautical miles or 40 kilometres.
- C. 27 nautical miles or 40 kilometres.
- D. 27 nautical miles or 50 kilometres.

QUESTION 4. How high above the ground is the tallest part of Didcot power station?

- A. 654 ft.
- B. 832 ft.
- C. 178 ft.
- D. 1486 ft.

QUESTION 5. How will the M4 be of assistance as a navigational aid?

- A. Assuming you are on track, it will help with assessing progress along track.
- B. It will help with drift assessment.
- C. It will confirm the right direction is being followed.
- D. Assuming you are on track, it will be of limited use as a navigational feature.

QUESTION 6. Approximately half way along the first leg the chart shows an area annotated LTMA 4500' ALT +. What indication would you expect on your altimeter, assuming it was set to zero before take off, at the base of the airspace?

- A. 5120 ft.
- B. 4500 ft.
- C. 3880 ft.
- D. 3500 ft.

QUESTION 7. With the altimeter set to 618 ft before take off, how high can you climb before commencing the task?

- A. 6118 ft.
- B. FL 55.
- C. 4882 ft.
- D. 5500 ft.

QUESTION 8. Assuming the altimeter is set to the Lasham QNH, what is the lowest indicated height allowed when crossing R101/2.4?

- A. 2400 ft.
- B. 1780 ft.
- C. 3000 ft.
- D. 240 ft.

QUESTION 9. What will be the duration of the task if the average speed is 50 Kph?

- A. 1 hour 30 minutes.
- B. 2 hours.
- C. 2 hours 30 minutes.
- D. 3 hours.

QUESTION 10. If the glide ratio is 1:30, and assuming there is nil wind, what height will be needed for a 4 Nm final glide when crossing the M3 at Basingstoke to arrive at 800 ft?

- A. 1350 ft above Lasham.
- B. 1450 ft above Lasham.
- C. 1600 ft above Lasham.
- D. 1800 ft above Lasham.

## ANSWERS

## Introduction

This paper is probably the easiest of all the Bronze papers to pass, because most of the answers may be read off the legend on the chart. There is however some slightly outdated parts and these are pointed out in the following text.

## QUESTION 1

This question is mainly intended to determine if you understand the principle of headings and the difference between a true and a magnetic heading.

1. First draw a line on the chart, between the centre of the circle marking Lasham and the small dot under the obstruction symbol at Didcot. You will need to use your imagination to locate the small dot--the legend at the bottom will give you a good idea.
2. Extend the line so it crosses the 1degree W line of longitude. This will make it easier to measure the angle. The longitude selected is always the nearest to the centre of the track line.
3. Using a protractor, measure the track angle. The longitude line is true north 360(T) or 000(T). You should get 342 degrees, (this is written 342(T)). An error of up to 2 degrees will still deliver the correct answer.
4. The return track is calculated by subtracting (or adding) 180 degrees.  $342(T) - 180 = 162(T)$ .
5. The question asks for the return track to be a magnetic heading. The paper tells us that the magnetic variation is 5 degrees west. Using the expression "variation west magnetic best—variation east, magnetic least", we can see that the magnetic bearing will be 5 degrees greater than the true bearing.  $162(T) + 5$  (magnetic variation) =  $167(M)$ .

## QUESTION 2

This question is a gift. Take your time and read the chart legend. All heights are above sea level. The numbers are in thousands of feet. You will only fail this question if you fail to read the legend properly.

## QUESTION 3

Again this is a gift---take your time, measure accurately and read the answer choices carefully.

P.S I will be interested to see what you make the actual distance.

## QUESTION 4

The answer is in the legend...again. The answer is based on a previous edition of the map---are you able to correct the confuser? The figures in brackets represent the height in feet above ground level; the "unbracketed" figure is the height above mean sea level. Make sure you read the question and ascertain which is required.

## QUESTION5

This is a very practical question. When you fly over the M4, you may be uncertain which part you have crossed, but none the less you may be certain it is the M4.

Line features at approximately 90 degrees to track are very useful in helping you see how far you have traveled along track. Sometimes you will get lucky and have some easily identified feature (like a service area or unique intersection), then you are able to fix your position.

## QUESTION6

This seems to be based on an earlier edition of the chart. "ALT" is not normally used in this context. LTMA stands for London Terminal Maneuvering Area, the A in a box identifies it as class A airspace (They throw the dungeon keys away if you are caught in this airspace), the base of the airway is either feet above mean sea level, or more commonly Flight level. + means the airspace continues up to FL245. All the explanations are in the legend, so even if you forget you can look it up---even in the test!!!

In this case the base of the airway is 4500 feet above mean sea level. BUT your altimeter is set to read heights above LASHAM and Lasham is 618 feet above sea level.

You will be at 4500 amsl when your altimeter reads 4500 minus 618 feet=3882 feet.

#### QUESTION 7

TRICK QUESTION.— take your time.

Lasham is 618 feet amsl, therefore with the altimeter set at 618 before take off; your altimeter is already reading height above the mean sea level.

The Airway above Lasham is 5500' +, this means the base is 5500 amsl and the airway extends up to FL245.

You can fly no higher than 5500 feet amsl above Lasham, and your altimeter is set to read this directly (a very sensible thing to do).

#### QUESTION 8

Setting your altimeter to QNH, means you are measuring your height above mean sea level.

Again if you are uncertain double check using the chart legend. R101/2.4 is a restricted area (No 101), which goes up to 2 point 4 thousand feet (2400), above mean sea level. You therefore cannot fly over this area below an indicated 2400 feet.

#### QUESTION 9

A QUESTION DESIGNED TO MAKE YOU DOUBT YOURSELF.

The task is an out and return, each of the 2 legs is 50 Km. Therefore the total task distance is 100Km. You are given the average speed, which will already take into account the effect of the wind and any time lost for rotten thermalling.

100Km at 50 Km/hr will therefore take 2 hours---simple

#### QUESTION 10

You will often find yourself needing information like this (unless you have a whizzy computer on board).

1 nautical mile is 6080 feet---call it 6000 for cash. Airborne this kind of approximation is perfectly acceptable.

4 nautical miles to go, is the same as 4 times 6000 feet =24000 feet to go.

The glider will travel forward 30 feet for every foot lost in height (30:1). Therefore it will require 24000/30 feet to complete the journey =800feet. 800 feet will be used (theoretically) to travel 4 nautical miles, but what about some spare for a circuit?

The answer is therefore, 800 feet for the glide plus 800 feet for the circuit =1600 feet **Above Lasham**