

SUBJECT : CASA CPL NAVIGATION

EXAM TYPE : Practice Paper No 3

PASS MARK : 80% FTA (70% CASA)

TIME ALLOWED : 1 Hour 45 Minutes

Instructions to Candidates:

1. This practice exam has been constructed to reflect the scope and complexity of questions candidates can expect in the CASA CPL Navigation examination.
2. All required material to answer the questions is provided with the paper.
3. Some questions refer to WAC charts and where applicable extracts of these charts have been provided. It is recommended that the candidate obtain paper copies of these charts in order to resolve the questions graphically, if so required.
4. PERMITTED MATERIAL
 - A. Material Supplied with Examination:
 - Answer Sheet
 - WAC Extract 1: Melbourne
 - WAC Extract 2: Townsville
 - WAC Extract 3: Sydney
 - ARFOR TAF 1
 - B. Material Supplied by Candidate:
 - Jeppesen Manual Complete
 - Navigation Equipment
 - Basic Electronic Calculator
5. ITEMS PROHIBITED
 - Programmable and/or Scientific Calculators
 - Electronic Aviation Calculators (Electronic Whizz-Wheels)
 - Any other Reference Material

- 1 The scale of the Jeppesen Chart AS (H/L) 4 is shown as 1 inch = 40 nm. What is this scale expressed as a Representative Fraction?

Note: 1 inch = 2.54 cm
 1 nm = 6076 feet
 1 foot = 12 inches

- a) 1 : 40.
- b) 1 : 40 000.
- c) 1 : 2 916 480.
- d) 1 : 2 500 000.

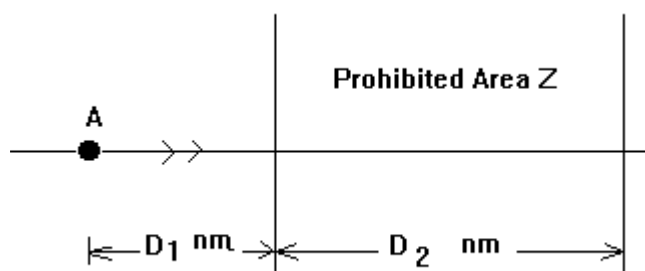
(2 Marks)

- 2 How do great circles appear on a Transverse Mercator projection?

- a) All great circles appear as straight lines.
- b) Concave to the nearer pole.
- c) Concave to the equator.
- d) The central meridian and Great Circles at 90° to the central meridian appear as straight lines. All other great circles appear as complex curves.

(1 Mark)

- 3 In the diagram below:



D1 20 nm
 D2 50 nm
 Prohibited Area Z is from 0 to 6000 feet
 The aeroplane at A is maintaining 3000 feet
 Climbing GS 120 kts

What is the minimum constant rate of climb required for a continuous climb on track to avoid Prohibited Area Z?

- a) 300 fpm.
- b) 600 fpm.
- c) 200 fpm.
- d) 150 fpm.

(2 Marks)

- 4 You are planning a VFR flight on the 10th July from MOUNT ISA (20°40'S 139°29'E) to TOWNSVILLE (19°15'S 146°46'E). Townsville requires an alternate and you nominate PROSERPINE (20°30'S 148°33'E).

Flight times are as follows:

Mount Isa to Townsville	3 hours 10 minutes
Townsville to Proserpine	55 minutes

Calculate the latest UTC time of departure from Mount Isa in accordance with Visual Flight Rules.

- a) 07100349.
- b) 07102337.
- c) 07100400.
- d) 07101343. (2 Marks)

- 5 The Australian AIP chart AUS RNAV 1 is based on the Lamberts Conformal Conic chart projection. Why is this projection particularly suitable for radio navigation?

- a) Rhumb lines appear as regular curves.
- b) The chart has approximately constant scale.
- c) Great circles appear as approximate straight lines.
- d) Straight lines, representing radio waves, cross all meridians at the same angle. (1 Mark)

- 6 Which navigation aid is likely to have a different range over land and water?

- a) TACAN.
- b) ADF.
- c) VOR.
- d) DME. (1 Mark)

- 7 Refer (MELBOURNE) WAC 3470:

What is the position of JINDABYNE (in the Great Dividing Range, NSW)?

- a) 36° 50' S 149° 07' E.
- b) 37° 35' S 149° 07' E.
- c) 36° 25' S 148° 37' E.
- d) 37° 25' S 148° 37' E. (2 Marks)

- 8 On which of the following dates will there be the shortest period of daylight at Alice Springs (24° 00'S 134° 00'E)?

- a) 23rd September.
- b) 21st March.
- c) 22nd December.
- d) 22nd June. (2 Marks)

- 9 An aircraft en-route between NDB A and VOR B obtains the following bearings:

NDB A	171° Relative
VOR B	RMI reads 192

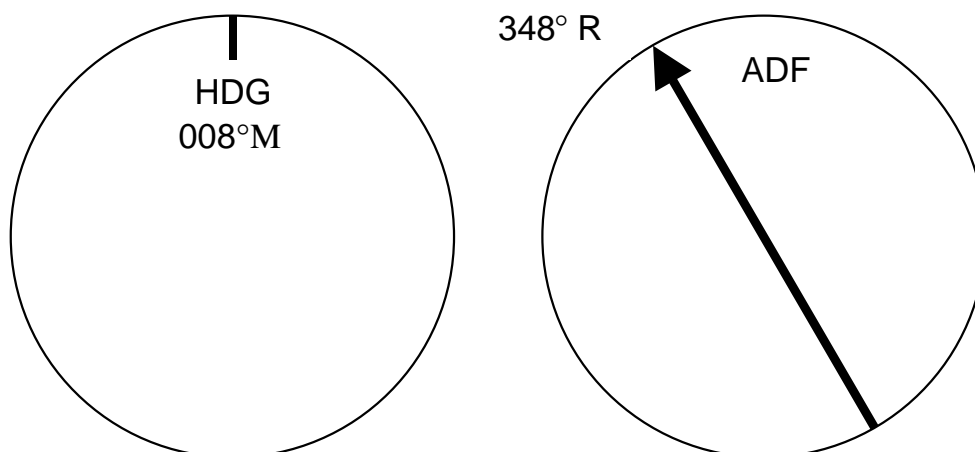
The aircraft has maintained a constant heading of 215°M since overflying NDB A.
The direct track between A and B measures 200°M.

What heading should the aircraft fly to track direct from its present position to VOR B?

- a) 191°.
- b) 201°.
- c) 209°.
- d) 214°.

(2 Marks)

- 10 What is the magnetic bearing to the NDB?



- a) 340°.
- b) 348°.
- c) 356°.
- d) 176°.

(2 Marks)

- 11 Which one of the following radio navigation aids is never frequency paired with DME?

- a) ILS.
- b) VOR.
- c) ADF.
- d) MLS.

(1 Mark)

12 Given the following conditions for planning a route segment:

ARFOR	
W/V	050/25
TRK($^{\circ}$ M)	283
TAS	125 kts
Variation	5 $^{\circ}$ W

The HDG ($^{\circ}$ M) and GS will be closest to:

- a) 294 $^{\circ}$ M and 115kts.
- b) 293 $^{\circ}$ M and 110kts.
- c) 292 $^{\circ}$ M and 140kts.
- d) 273 $^{\circ}$ M and 138kts.

(2 Marks)

13 Given:

Pressure altitude	9000 ft
OAT	-11 $^{\circ}$ C
CAS	120 kts

Determine the TAS.

- a) 135 kts.
- b) 130 kts.
- c) 106 kts.
- d) 125 kts.

(2 Marks)

14 The end of daylight in Z at DARWIN on the 23rd August is closest to:

- a) 0816 Z.
- b) 0846 Z.
- c) 0946 Z.
- d) 0932 Z.

(2 Marks)

15 Refer (SYDNEY) WAC 3456:

For a flight from YBTH to YSDU:

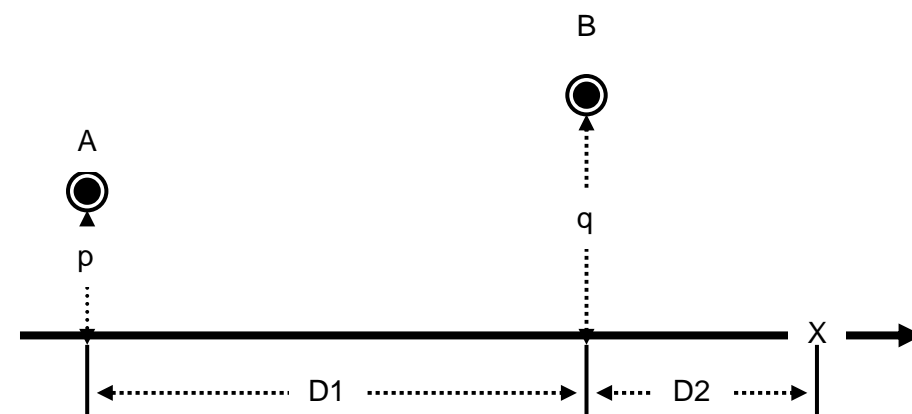
ATD YBTH	2305 UTC
Over HILL END town (approximately 30 nm from YBTH)	2317 UTC
Constant HDG maintained since departure YBTH	

The alternation of HDG required to regain planned TRK to YSDU abeam Wellington town is closest to:

- a) 10 $^{\circ}$ left.
- b) 10 $^{\circ}$ right.
- c) 14 $^{\circ}$ left.
- d) 14 $^{\circ}$ right.

(2 Marks)

16 Referring to the following:



p 3 nm
 q 6 nm
 D1 90 nm
 D2 45 nm

Overhead "A" at 0400 UTC

A constant HDG has been maintained between "A" and "B"

You fix your position overhead "B" at 0430 UTC

The alteration of HDG required at time 0430 to intercept track at "X" is closest to:

- a) 6° right.
- b) 8° right.
- c) 10° right.
- d) 12° right.

(2 Marks)

17 Which of the following statements is correct with reference to a WAC?

- a) One degree of latitude at the equator is equal to one nautical mile.
- b) One degree of longitude is equal to one statute mile.
- c) One minute of longitude is equal to one statute mile.
- d) One minute of latitude is equal to one nautical mile.

(1 Mark)

18 The flight time from departure ALBURY ($30^{\circ} 04'S$ $148^{\circ} 57'E$) to landing at BALLARAT ($37^{\circ} 31'S$ $143^{\circ} 48'E$) is 90 minutes. No alternate aerodrome is required for BALLARAT.

The latest ETD ALBURY for a VFR Day flight on 15 December is closest to:

- a) 1808 UTC.
- b) 0843 UTC.
- c) 0833 UTC.
- d) 0815 UTC.

(2 Marks)

19 Refer to (MELBOURNE) WAC 3470:

En-route Glenmaggie township ($37^{\circ} 54'S$ $146^{\circ} 45'E$) to Mallacoota YMCO. You obtain a fix at 2043Z over a crossroads 1 nm north of Walpa near Bairnsdale. You make a heading alteration to $081^{\circ}M$ and hold this new heading until you obtain another fix over Bemm River Township (16 nm east of Orbost) at 2118Z.

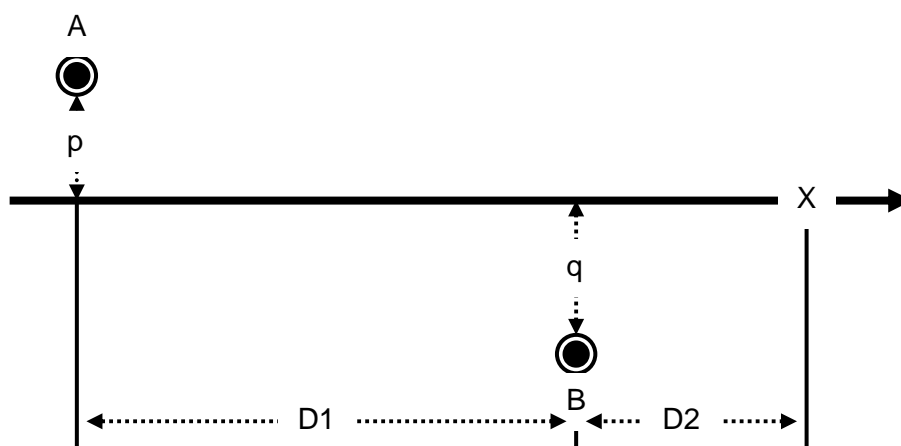
The heading to fly to track direct from the 2118Z fix to YMCO is closest to:

- a) $063^{\circ} M$.
 - b) $067^{\circ} M$.
 - c) $074^{\circ} M$.
 - d) $076^{\circ} M$.
- (3 Marks)

20 Australian Visual Terminal Charts are based on which projection?

- a) Normal Mercator.
 - b) Oblique Mercator.
 - c) Lamberts Conformal.
 - d) Transverse Mercator.
- (1 Mark)

21 Referring to the following:



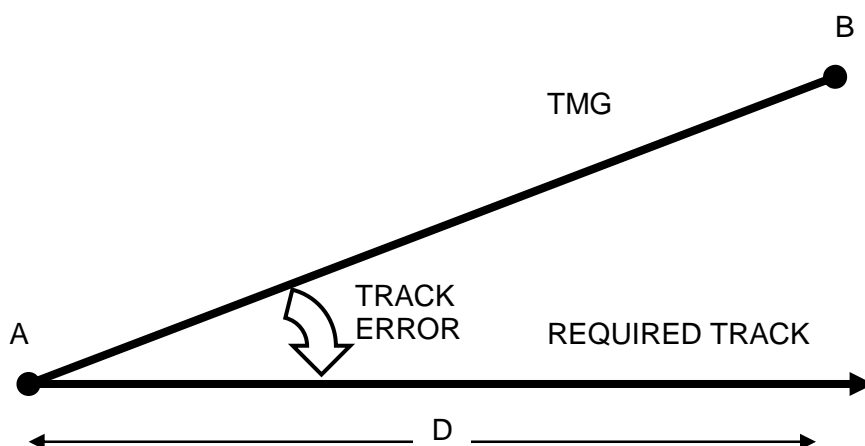
p
q
D1 = D2
A constant HDG has been maintained since A

2nm
4nm
30nm

The alteration of HDG required at B to intercept track at X is:

- a) 8° .
 - b) 12° .
 - c) 16° .
 - d) 20° .
- (2 Marks)

22 Refer to the following:



Track error 9°
 D 20 nm
 A constant HDG has been maintained since 0400Z (at A)
 The pilot alters HDG 12° right at 0410Z (at B)

At what time should the required track be intercepted?

- a) 0450Z.
 - b) 0430Z.
 - c) 0420Z.
 - d) 0440Z.
- (2 Marks)

23 Refer ARFOR / TAF 1:

Depart YSWG 0500Z – YSCB - arrive YMER 0715Z.

The forecast wind velocity at 10 000 ft between YSCB and YMER is:

- a) 280° M at 30 kts reducing to zero.
 - b) 340° M at 40 kts.
 - c) 340° T at 40 kts.
 - d) 280° T at 30 kts.
- (2 Marks)

24 Given:

Area forecast W/V	125/40
TRK ($^\circ$ T)	080°
Variation	10° E
TAS	160 kts

Determine HDG ($^\circ$ M) and GS.

- a) 092° and 114 kts.
 - b) 090° and 130 kts.
 - c) 082° and 135 kts.
 - d) 080° and 130 kts.
- (2 Marks)

- 25 Last light at your planned destination for a day VFR flight is 0835UTC. The TAF includes weather conditions requiring 30 minutes holding. The planned time interval for the flight is 55 minutes. What is the latest time you may depart on this flight?

a) 0740 UTC.
 b) 0730 UTC.
 c) 0615 UTC.
 d) 0700 UTC.

(2 Marks)

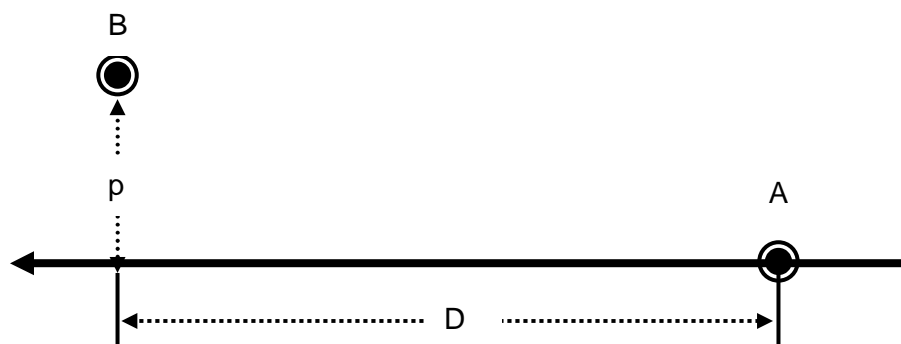
- 26 Refer (TOWNSVILLE) WAC 3219:

At 0220Z you depart SPRING CREEK Airfield ($18^{\circ}39'S$ $144^{\circ}33'E$) to track direct to INGHAM ($18^{\circ}40'S$ $146^{\circ}09'E$). At 0227Z your position is on track South of Lilly Spring homestead (approximately 15 nm from SPRING CREEK). From this position a HDG of $075^{\circ}M$ is maintained until you obtain a pinpoint at 0238Z over Lake Lucy homestead (approximately 40 nm from SPRING CREEK). What is your ETA for INGHAM?

a) 0246 Z.
 b) 0252 Z.
 c) 0259 Z.
 d) 0250 Z.

(3 Marks)

- 27 Refer figure below:



p 4 nm
 D 60 nm
 Track $270^{\circ}M$

A constant TAS and HDG of $265^{\circ}M$ have been maintained between 0200Z (at A) and 0240Z (at B)

The drift experienced during this period was:

a) 12° right.
 b) 9° right.
 c) 5° right.
 d) 4° right.

(2 Marks)

Total 50