SUBJECT : CASA CPL NAVIGATION

EXAM TYPE : Practice Paper No 1

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: Bourke
- WAC Extract 2: Townsville

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 earliest departure time for a VFR flight from Perth/Jandakot (32°06'S 115°53'E) on May 7th is:

a) 05070609 UTC.
b) 05062225 UTC.
c) 05072325 UTC.
d) 05062215 UTC. (2 Marks)

2 For a chart to be orthomorphic (conformal):

a) scale must be constant and meridians and parallels must cut at 90°.
b) meridians must be straight lines and parallels must be arcs of concentric circles.
c) rhumb lines must be straight lines and scale must expand at a constant rate.
d) scale N-S must match the scale E-W around any point and meridians and parallels must cut at 90°. (1 Mark)

3 The Jeppesen chart AS (H/L) covers a region of South-East Asia close to the equator. The chart is based on a Normal Mercator Projection. Why is the Mercator projection suitable for this radio navigation chart?

a) Great circles close to the equator will appear as approximate straight lines.
b) The scale of the chart is small so considerable detail can be shown.
c) Rhumb lines appear as straight lines at all latitudes.
d) It is not necessary to use an orthomorphic chart for radio navigation. (1 Mark)

4 An aircraft en-route between NDB X and VOR Y obtains the following bearings:

NDB X 176° Relative
VOR Y RMI reads 294°

The aircraft has maintained a constant heading of 288°M since overflying NDB X. The direct track between X and Y measures 290°M. What heading should the aircraft fly to track direct from its present position to VOR Y?

a) 292°.
b) 290°.
c) 298°.
d) 294°. (2 Marks)

5 Which of the following describes the principle by which VOR measures magnetic radials?

a) Phase comparison.
b) Pulse modulation.
c) Loop and sense aerials.
d) Radar ranging. (1 Mark)

6 The earliest departure time for a VFR flight from Sydney/Bankstown (33°56'S 150°59'E) on June 12th is:

a) 06120630 UTC.
b) 06121639 UTC.
c) 06112030 UTC.
d) 06120721 UTC. (2 Marks)

7 The scale of the Jeppesen chart AS (H/L) 6 is shown as 1 inch = 50 nm. What is this scale expressed as a Representative Fraction?

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

a) 1 : 5 000 000.
b) 1 : 50.
c) 1 : 304 000.
d) 1 : 3 645 600. (2 Marks)

8 The Transverse Mercator is most suitable for mapping:

a) polar regions.
b) equatorial regions.
c) areas within 300 nm of the central meridian.
d) areas of the earth which have wide East-West extent but little North-South extent. (1 Mark)

9 What is the rated coverage of a VOR for an aircraft flying at 7,000 feet?

a) 103 nm.
b) 100 nm.
c) 90 nm.
d) 60 nm. (2 Marks)

10 You are planning a VFR flight on the 20th October from Mount Gambier. (37° 45'S 140° 47'E) to Adelaide (34° 57'S 138° 32'E). Adelaide requires an alternate and you nominate Port Lincoln (34° 36'S 135° 53'E).

Flight times are as follows:

Mount Gambier to Adelaide	1 hour 25 minutes.
Adelaide to Port Lincoln	45 minutes

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

a) 10200720.
b) 10191722.
c) 10210129.
d) 10200735. (2 Marks)

11 The Jeppesen chart AS (H/L) 6 is based on the Lambert Conformal Conic projection with standard parallels at 21° 20'S and 40° 10'S. With reference to scale on this chart, which of the following statements is true?

a) The scale at 21° 20'S is less than the scale at 31°S.
b) The scale at 21° 20'S is less than the scale at 40° 10'S.
c) The scale at 21° 20'S is greater than the scale at 40° 10'S.
d) The scale at 21° 20'S is equal to the scale at 40° 10'S. (1 Mark)

12 In which of the following circumstances would DME in an aircraft at FL 310 be able to provide an accurate ground speed read-out?

a) When 8 nm from the DME at the abeam position.
b) When tracking directly away from the DME at range 90 nm.
c) At range 6 nm on a track which passes over the DME.
d) When passing overhead the DME. (1 Mark)

13 Given the following information

Time 0242 UTC	VOR MIKE 210° radial DME MIKE 94 nm
Time 0254 UTC	VOR MIKE 210° radial DME MIKE 70 nm

Heading 022°M and TAS 150 kt maintained constant throughout. What wind velocity is affecting the flight?

a) 050°/40 kt.
b) 245°/35 kt.
c) 065°/40 kt.
d) 355°/35 kt. (2 Marks)

14 When using DME, what is the main cause of error?

a) Coastal refraction.
b) Site error.
c) Slant range is not the same as plan range.
d) Scalloping. (1 Mark)

15 What is the approximate time available for a VFR flight on 5th January, from PORT HEDLAND (YPPD) WA (20º23'S 118º38'E) to CEDUNA (YCDU) SA (32º08'S 133º43'E) if you plan to land YCDU 30 mins before the end of daylight?

a) 9 hr 30 min.
b) 12 hr 15 min.
c) 12 hr 45 min.
d) 13 hr 10 min. (2 Marks)

16 Given:

Descent GS	150 kt
Distance	25nm
Cruise altitude	A100
Area QNH	1013 hpa
Aerodrome elevation	2000 ft
QNH	1013 hpa

Determine the rate of descent required to arrive over the aerodrome at 1000 ft AGL.

a) 700 fpm.
b) 800 fpm.
c) 900 fpm.
d) 1150 fpm. (2 Marks)

17 The following details apply to your flight:

Track 181^0M
Heading 178^0M
ARFOR indicates OVC cloud at 10,000 ft

The highest altitude at which you may cruise VFR in accordance with the Table of Cruising Levels is:

a) A085.
b) A090.
c) A095.
d) A010. (2 Marks)

18 An ARFOR for an intended route indicates CLD BKN SC/CU GROUND LEVEL TOPS 6000.

Under the above conditions what is the lowest cruise level available in accordance with the Table for Cruising Levels for a VFR flight tracking 065^0M in class G airspace?

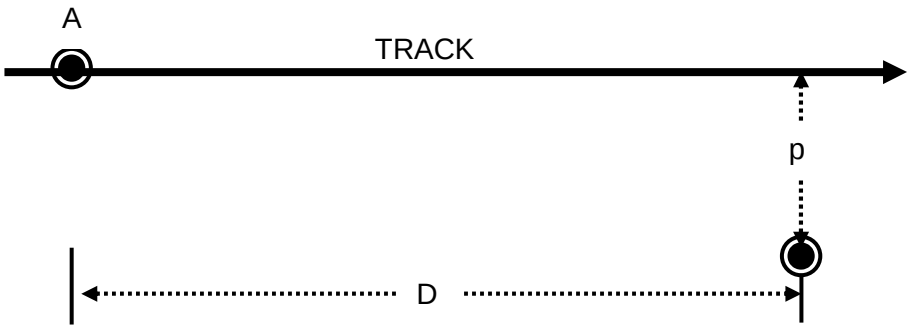
a) A080.
b) A075.
c) A070.
d) A065. (2 Marks)

19 Last light at your planned destination for a day VFR flight is 0905UTC. The TAF includes weather conditions requiring 30 minutes holding. The planned time interval for the flight is 85 minutes.

What is the latest time at which you may depart for this flight?

a) 0615 UTC.
b) 0700 UTC.
c) 0730 UTC.
d) 0740 UTC. (2 Marks)

20 With reference to the following diagram



Track 080ºM
p 9nm
D 90nm
A constant TAS and a HDG of 090ºM have been maintained between 1100 (at A) and 1140 (at B)

The drift experienced during this period was:

a) 4^0 left.
b) 10^0 left.
c) 4^0 right.
d) 6^0 right. (2 Marks)

21 Refer (TOWNSVILLE) WAC 3219:

At 2342 UTC you set course over ROLLINGSTONE (approximately 25nm NW TOWNSVILLE) to track direct to SPRING CREEK (18º 38'S 144º 33'E). HDG 270ºM is maintained until you pinpoint your position over Mt Lyall (South of Camel Creek) Landing Area at 0003UTC.

The HDG (ºM) required to track direct to SPRING CREEK from this position is closest to:

a) 286ºM.
b) 292ºM.
c) 248ºM.
d) 281ºM. (3 Marks)

22 Given:

Cruising level	A090
Descent GS	150kt
Rate of descent	500 fpm
Area QNH	Local QNH

You are requested to reach 3000ft by 40nm from destination

At what minimum distance from destination could you commence a continuous descent to comply with this request?

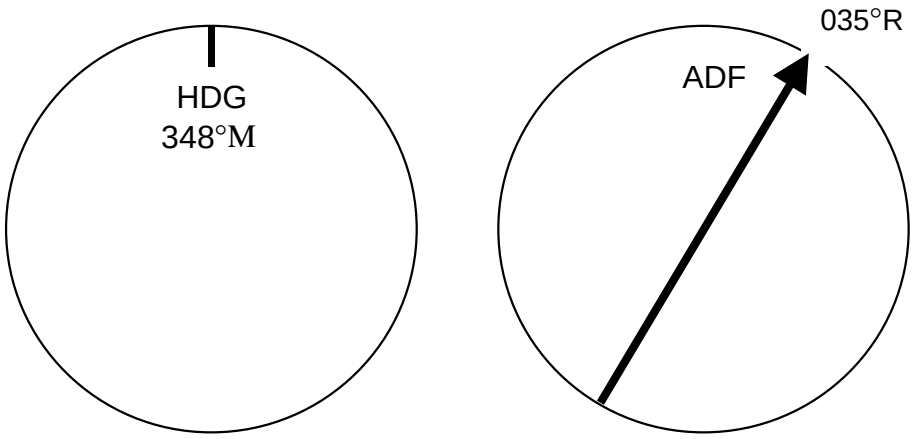
a) 30 nm.
b) 55 nm.
c) 70 nm.
d) 85 nm. (2 Marks)

23 Refer (BOURKE) WAC3356:

You plan direct WEE WAA (YWWA) aerodrome to ST GEORGE (YSGE) aerodrome. At 0235Z you depart YWWA with a planned GS of 120 kts. At 0255Z you pinpoint yourself left of track over WOODVALE homestead and alter HDG 10º right. At 0315Z you pinpoint your position over MUNGINDI township. The alternation of HDG to track to YSGE from the 0315Z position is closest to:

a) 15° left.
b) 10° left.
c) 19° left.
d) 4° left. (3 Marks)

24 What is the magnetic bearing of the aircraft from the NDB?



a) 023°.
b) 133°.
c) 313°.
d) 203°. (2 Marks)

25 Given:

Cruising level	A060
Descent GS	120 kt
AD elevation	1500 ft
Area QNH = Local QNH	1013 hPa

To avoid traffic, you are requested to commence descent on track, at 30 DME to arrive overhead the aerodrome at 1500 ft agl. What is the minimum constant rate of descent required to comply with this request?

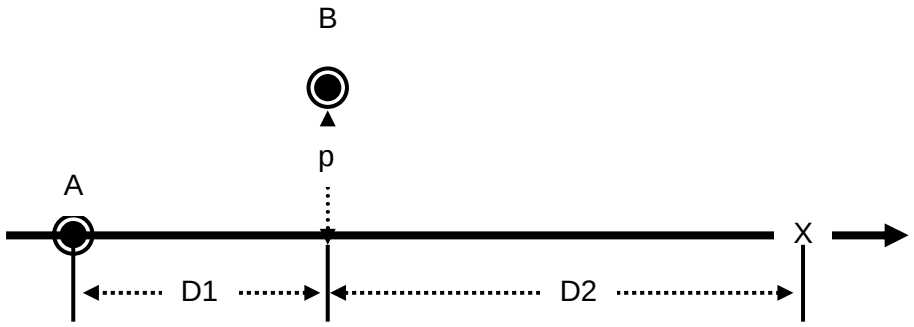
a) 400 fpm.
b) 300 fpm.
c) 200 fpm.
d) 150 fpm. (2 Marks)

26 If uncertain of position how can you track to an aerodrome with a VOR?

Tune and identify the station; turn OBS until the:

a) CDI is centred and flag shows FROM keep CDI centred by flying towards the needle if it wanders off centre.
b) course window indicated 000. Turn aircraft till the CDI centred and fly towards the needle if it wanders off centre.
c) CDI is centred and the flag shows TO. Keep CDI centred by flying towards the needle if it wanders off centre.
d) course window indicated 000 and flag shows TO. Maintain 000 in the course window and the CDI central. (1 Mark)

27 Refer Figure below



p	2nm
D1	20nm
D2	60nm

A constant HDG has been maintained since 0400UTC (at A)

At 0410UTC (at B) the track error is:

a) 8º left.
b) 6º left.
c) 2º left.
d) 12º left. (2 Marks)

28 You departed at 0100Z from MELBOURNE, VIC (YMML) (S37º40' E144º51') for WYNYARD, TAS (YWYY) via COWES. If you are cruising at A090, what is the rated coverage of the WYNYARD NDB (YWYY)?

a) 110 nm.
b) 90 nm.
c) 65 nm.
d) 160 nm. (2 Marks)

Total 50 Marks