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School code

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School name

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Given name/s

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Family name

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Attach your
barcode ID label here

Book

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of

--

books used

External assessment

Question and response book

Aerospace Systems

Time allowed

- Perusal time — 10 minutes
- Working time — 120 minutes

General instructions

- Answer all questions in this question and response book.
- QCAA-approved calculator permitted.
- QCAA-approved flight calculator permitted.
- Protractor and ruler or plotter required.
- QCAA formula and data book provided.
- Planning paper will not be marked.

Section 1 (10 marks)

- 10 multiple choice questions

Section 2 (70 marks)

- 13 short response questions



Section 1

Instructions

- Choose the best answer for Questions 1–10.
- This section has 10 questions and is worth 10 marks.
- Use a 2B pencil to fill in the A, B, C or D answer bubble completely.
- If you change your mind or make a mistake, use an eraser to remove your response and fill in the new answer bubble completely.

	A	B	C	D
Example:	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	A	B	C	D
1.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Do not write outside this box.

Section 2

Instructions

- Write using black or blue pen.
 - If you need more space for a response, use the additional pages at the back of this book.
 - On the additional pages, write the question number you are responding to.
 - Cancel any incorrect response by ruling a single diagonal line through your work.
 - Write the page number of your alternative/additional response, i.e. See page ...
 - If you do not do this, your original response will be marked.
 - This section has 13 questions and is worth 70 marks.
-

DO NOT WRITE ON THIS PAGE

THIS PAGE WILL NOT BE MARKED

Do not write outside this box.

QUESTION 11 (6 marks)

List six types of information provided by a PFD.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

QUESTION 12 (5 marks)

Provide five possible physical environment causes for a pilot experiencing an increased level of physical stress in an aircraft cockpit.

1. _____
2. _____
3. _____
4. _____
5. _____

Do not write outside this box.

QUESTION 13 (4 marks)

Explain the purpose and function of the human vestibular system.

QUESTION 14 (4 marks)

Explain the relationship between hyperventilation and hypoxia using an example aerospace context.

Do not write outside this box.

QUESTION 15 (5 marks)

Describe how a PSR operates and what it is used to measure.


QUESTION 16 (5 marks)

Define Vb and explain its purpose.

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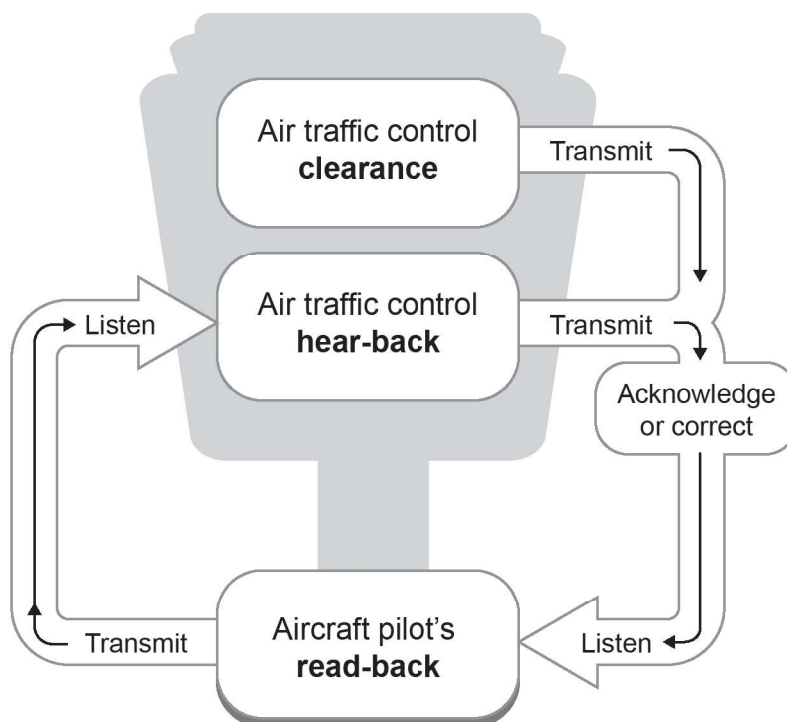
QUESTION 18 (5 marks)

A VFR flight from Manjimup (YMJM) to Gascoyne Junction (YGSC) is being planned. Interpret the GAF to justify an appropriate departure time and altitude for the flight.

Graphical Area Forecast SFC - 10000FT WA-S Issued at 1909142206Z - Valid 142300 to 150500Z Weather Features valid at 142300Z			
			Australian Government Bureau of Meteorology
AREA	SURFACE VIS AND WX	CLOUD, ICING AND TURB	FZLVL
A	>10KM NIL		ABV 10000FT
		MOD TURB SFC/ABV10000FT IN THERMALS LAND FM 03Z	
B	>10KM NIL	BKN ST 1500/2500FT LAND TL 01Z, BASE 0500FT WI 20NM OF COAST SCT ST 1500/2500FT SEA BKN SC 3000/4000FT LAND S OF YDON/YPKG FM 01Z, 5000/6000FT FM 03Z	ABV 10000FT
	2000M ISOL FU BLW 5000FT LAND SW OF YGEL/YNRB		
	0300M ISOL FG LAND TL 00Z		
C	>10KM NIL	BKN CU/SC 3000/6000FT, BASE 5000FT LAND FM 03Z	10000FT, FZ LVR 5000/7000FT S OF YAUG/YABA
	2000M ISOL FU BLW 5000FT LAND		
	0300M ISOL FG VAL TL 01Z		
D	>10KM NIL	BKN ST 0800/2000FT D1 SEA/5NM INLAND FM 01Z BKN ST 1500/2000FT LAND E OF HDP TL 03Z (D1 TL 01Z), BASE 0500FT WI 30NM OF COAST BKN SC 2000/5000FT	ABV 10000FT, FZ LVR 5000/7000FT S OF YABA
	4000M ISOL SHRA SEA/15NM INLAND W OF ISB	BKN CU 2000/7000FT	
	2000M SCT DZ LAND E OF HDP (D1 FM 03Z)	BKN ST 1300/2000FT, BASE 0300FT WI 30NM OF COAST BKN SC 2000/7000FT	
	0300M ISOL FG LAND TL 00Z	BKN ST 0100/2000FT	
E	>10KM NIL	BKN ST 1000/2000FT TL 03Z SCT SC 2000/5000FT	ABV 10000FT
	6000M ISOL SHRA TL 03Z	BKN AC/AS ABV10000FT	
	4000M ISOL TSRA TL 03Z	ISOL CB ABV10000FT BKN ST 0800/2000FT SCT SC 2000/7000FT	

Do not write outside this box.

QUESTION 19 (7 marks)



Analyse the feedback loop that occurs between ATC and aircraft pilots to evaluate its effectiveness in the context of the communication between the two speakers. Use two examples to support your evaluation.

Do not write outside this box.



A large rectangular box containing 15 horizontal lines for writing.

Do not write outside this box.



QUESTION 20 (5 marks)

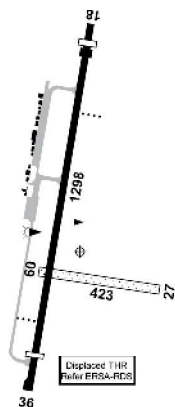
An aircraft is en route from Adelaide to Albury. Strong headwinds have delayed the flight and fuel burn has been higher than planned. As light is quickly fading, the pilot must find an alternative airport for a low-light landing and overnight stay. Shepparton and Tocumwal are the closest available airports. Use the ERSA extracts to evaluate which airport is the most appropriate alternative.

SHEPPARTON AVFAX CODE 3055

ELEV 375

VIC
362544S 1452333E UTC +10
AD OPR Greater Shepparton City Council VAR 11 DEG E

YSI IT
REG



REMARKS

- AD AVBL to ACFT ABV 5,700KG MTOW by arrangement.
- Landing fees apply.

HANDLING SERVICES AND FACILITIES

Gawne Aviation: 2200-0700 UTC DLY, AH PN during BH,
Phone xx xxxx xx xx AVGAS, O125, E1. No carnet accepted.

UNICOM

118.8 2200-0700 UTC DLY.

PASSENGER FACILITIES

PT/TX/HC/AC/LG/RF/WC.

AERODROME OBSTACLES

- Lit TWR 629FT AMSL (255FT AGL) 2.91NM N of ARP (PSN 362249.69S 1452400.91E).
- Lit TWR 507FT AMSL (137.1FT AGL) 1.195M NW of ARP (PSN 362512.23S 1452305.44E).
- Lit Mast 665FT AMSL (285FT AGL) 6.37NM N of ARP (PSN 362053.24S 1452216.69E).
- Unlit Mast 834FT AMSL (434FT AGL) 7.66NM NE of ARP (PSN 362243.84S 1453214.57E).
- RWY 18/36 transitional SFC infringed by tree growth on the E side of RWY (PSN 362512.00S 1452324.00E).
- Tree 74FT AGL BRG 170 MAG 980M FM TKOF RWY 36. Infringes TNS by 6FT.

METEOROLOGICAL INFORMATION PROVIDED

- TAF CAT D, METAR/SPECI.
- AWIS Phone xx xxxx xxxx - Report faults to BoM.
- AWIS FREQ 212 - Report faults to AD OPR.

PHYSICAL CHARACTERISTICS

09/27	088	14c	5700/350 (51PSI) Brown gravel	WID 30	RWS 90
18/36	179	43a	5700/450 (65PSI) Sealed Surface	WID 18	RWS 90

AERODROME AND APPROACH LIGHTING

RWY 18/36 LIRL(1) PAL 123.9 PAL+AFRU
118.8

RWY 18/36 PTBL(2)

RWY 18 PAPI 3.0 DEG 38FT

RWY 36 PAPI 3.3 DEG 44FT

- (1) PAL + AFRU requires three one-second pulses to activate (See INTRO para 23.5). PAL requires three three-second pulses to activate (See INTRO para 23.4).

- (2) EMERG use only - 45 MIN PN required

RWY edge light spacing: 18/36: 90M.

OTHER LIGHTING

TWY LGT: Blue edge.

TOCUMWAL**AVFAX CODE 3056**

NSW

354839S

1453615E

AD OPR Berrigan Shire Council

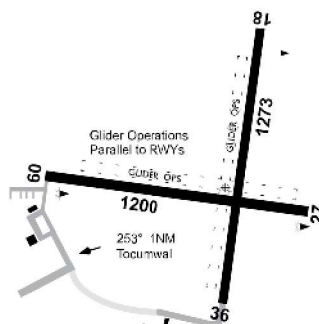
ELEV 372

UTC +10

VAR 11 DEG E

YTOC

REG

**REMARKS**

Operations Manager

HANDLING SERVICES AND FACILITIES

Aero Refuellers: PHxx xxxx xxxx AVGAS H24 (Aero Refuellers Carnet, MC, V) AVBL, unmanned.

PASSENGER FACILITIES

AC/PT/WC/RF.

AERODROME OBSTACLES

Telephone Tower: 546FT AMSL 277DEG MAG 2.6NM FM ARP.

PHYSICAL CHARACTERISTICS

09/27 087 39a 5700/580 (84PSI)

WID 30 RWS 90

18/36 177 42a 5700/580 (84PSI)

WID 30 RWS 90

AERODROME AND APPROACH LIGHTING

RWY 09/27 LIRL(1) PAL+AFRU 125.5

(1) PAL+AFRU requires three one-second pulses to activate (See INTRO para 23.5).

RWY edge light spacing: 09/27: 90M.

OTHER LIGHTING

TWY LGT: Blue edge.

Do not write outside this box.



Do not write outside this box.





QUESTION 22 (6 marks)

Use the landing chart on the opposite page and the provided aerodrome details to determine the suitability of the aerodrome for landing an aircraft with an AUW of 1000 kg.

Elevation: 4490 ft

QNH: 996 hPa

Temperature: 25 °C

Runway: 08/26

Slope: 1% down on 04

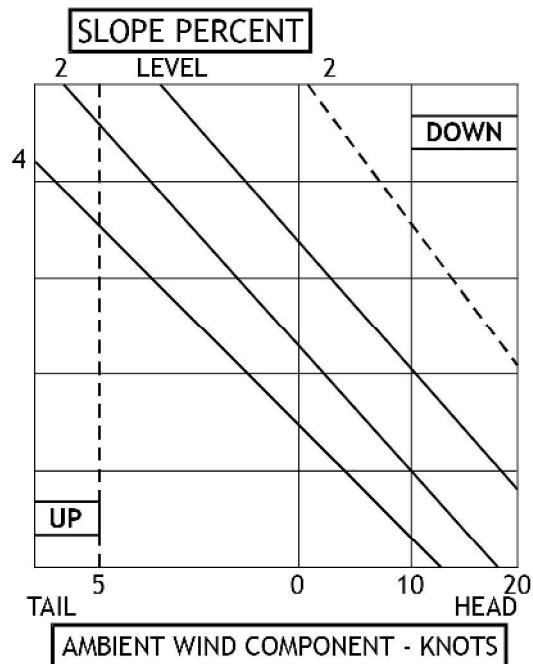
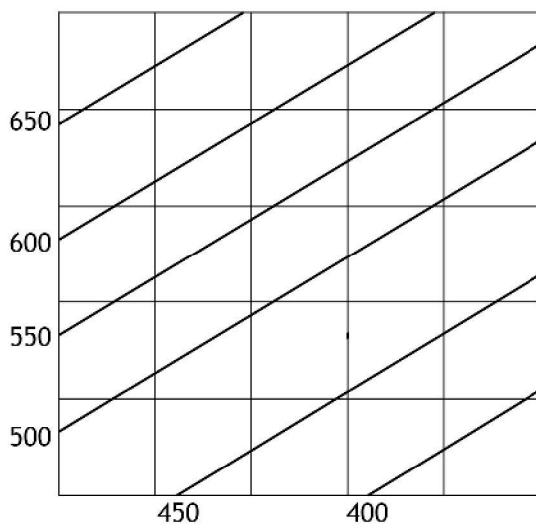
Wind: 080/05 M

Surface: Long dry grass

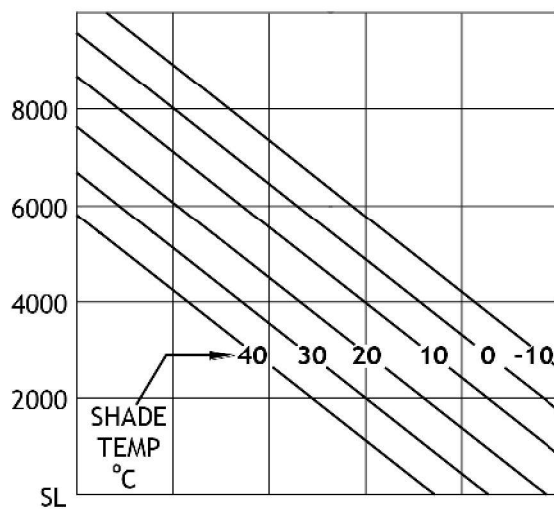
Runway length: 620 m

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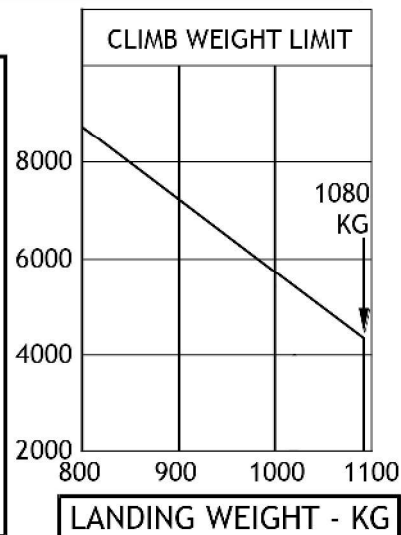
LANDING DISTANCE REQUIRED - METRES



AIRFIELD PRESSURE HEIGHT - FT



AIRFIELD PRESSURE HEIGHT - FT



Note: If you make a mistake on the landing chart, cancel it by ruling a single diagonal line through your work and use the additional chart provided on page 22 of this question and response book.

Do not write outside this box.



Do not write outside this box.

QUESTION 23 (9 marks)

A pilot is flying an aircraft from Bendigo to Warracknabeal airport at a TAS of 90 kt. When 10 minutes from Warracknabeal, the pilot is made aware that Warracknabeal airport is now closed. Use the provided data and the WAC on the opposite page to determine the most appropriate action for the pilot to take. Provide an HDG, an ETI from the diversion point and how much fuel will be onboard when the aircraft lands at a licensed airfield. State any assumptions you made.

Note: Donald airfield is closed due to flooding.

Wind on TAF: 101/35

Magnetic variation: 11° E

Fuel on board at start up: minimum required

Fixed reserve: 15 minutes

Taxi fuel: 5 L

Fuel burn: 40 L/hr

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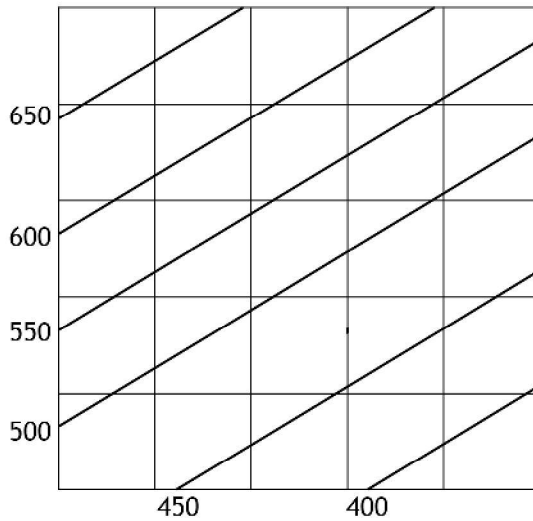
END OF PAPER

Do not write outside this box.

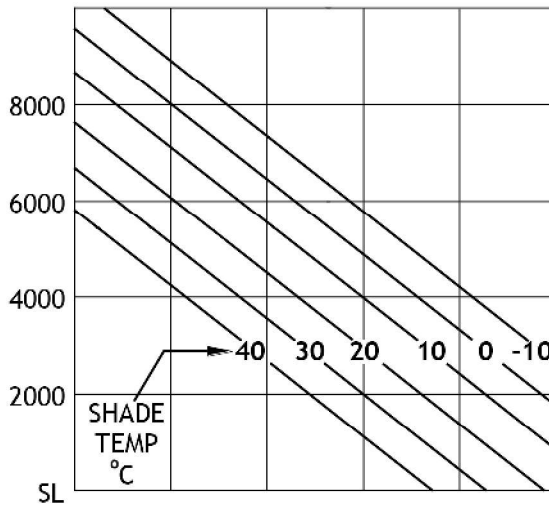
ADDITIONAL RESPONSE SPACE FOR QUESTION 22

If you want this landing chart to be marked, rule a line through the landing chart provided on page 16.

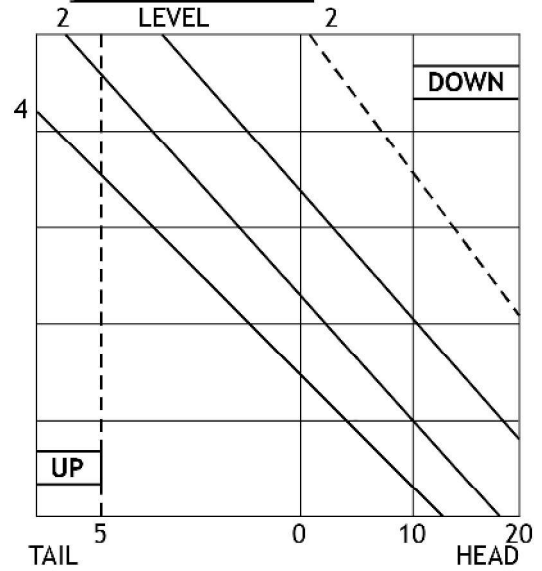
LANDING DISTANCE REQUIRED - METRES



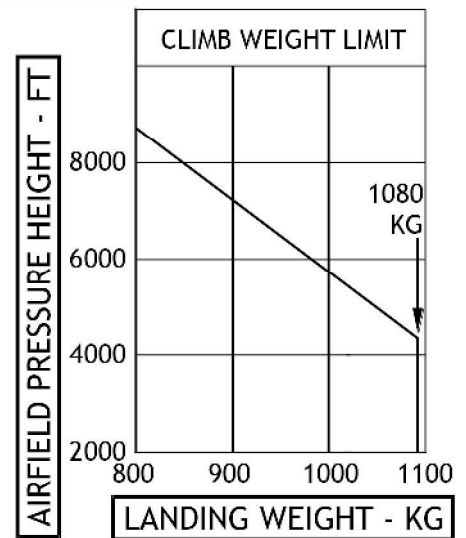
AIRFIELD PRESSURE HEIGHT - FT



SLOPE PERCENT



AMBIENT WIND COMPONENT - KNOTS



LANDING WEIGHT - KG

Do not write outside this box.

References

Question 18

Bureau of Meteorology, 'Graphical area forecasts, WA-S', www.bom.gov.au/aviation/gaf/gaf.shtml#1.

Question 19

Flight Safety Foundation, Skybrary 2018, 'Pilot-controller communications (OGHFA BN)', [www.skybrary.aero/index.php/Pilot-Controller_Communications_\(OGHFA_BN\)](http://www.skybrary.aero/index.php/Pilot-Controller_Communications_(OGHFA_BN)).

Question 20

Airservices Australia 2019, 'Aeronautical information package — En Route Supplement Australia (ERSA)' www.airservicesaustralia.com/aip/aip.asp?pg=40&vdate=08NOV2018&ver=2 This work contains aeronautical information and data which is (c) Airservices Australia 2019. No part of this work may be reproduced in any form or by any means without the prior written consent of Airservice Australia. Airservices Australia does not guarantee that the aeronautical information and data is current or free from errors, and disclaims all warranties in relation to its quality, performance or suitability for any purpose. Not for operational use. All rights reserved. Used by QCAA with permission.

Questions 22 and 23

Civil Aviation Safety Authority 2018, 'RPL, PPL & CPL (Aeroplane) Workbook Version 2 — 08 November 2018' (training workbook), www.casa.gov.au/sites/default/files/rpl-ppl-cpl-aeroplaneworkbook.pdf. Licensed under a Creative Commons Attribution—4.0 International Licence

Airservices Australia 2019, 'Aeronautical information package — En Route Supplement Australia (ERSA)', Airservices Australia 2019, 'Aeronautical information package — En Route Supplement Australia (ERSA)', www.airservicesaustralia.com/aip/aip.asp?pg=40&vdate=08NOV2018&ver=2

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