

External assessment 2024

Multiple choice question book

Aerospace Systems

General instruction

- Work in this book will not be marked.

Section 1

Instruction

- Respond to these questions in the question and response book.
-

QUESTION 1

Use the information provided in the SP107 to calculate the estimated elapsed time to Andamooka.

SP107 — NAV/COMM LOG										
PSN	LSALT	ALT	TAS	TR (m)	WIND	HDG	G/S	DIST	ETI	EET
Woomera										
Olympic Dam	A015	A045	100	358	040/20	006	084	39	28	28
Andamooka	A017	A045	100	078	040/20	071	083	19		?

- (A) 14 minutes
- (B) 28 minutes
- (C) 42 minutes
- (D) 56 minutes

QUESTION 2

Galileo is

- (A) a visual approach slope guidance system.
- (B) the habitable low-Earth orbit space station.
- (C) a global GNSS owned and operated by the European Union.
- (D) an effect experienced by the human body when under excessive G force.

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QUESTION 3

The normal maximum structural cruising speed is better known as

- (A) Vfe.
- (B) Vfo.
- (C) Vne.
- (D) Vno.

QUESTION 4

After a long leg of a navigation flight in clear skies, a pilot is slow to identify traffic that ATC has asked to confirm as sighted.

Why would the pilot have a delayed recognition of other aircraft?

- (A) hypoxia due to cruising at low altitude
- (B) empty field myopia due to the flight conditions
- (C) high levels of situational awareness due to low workload
- (D) hyperventilation due to excessive carbon dioxide levels from over-breathing

QUESTION 5

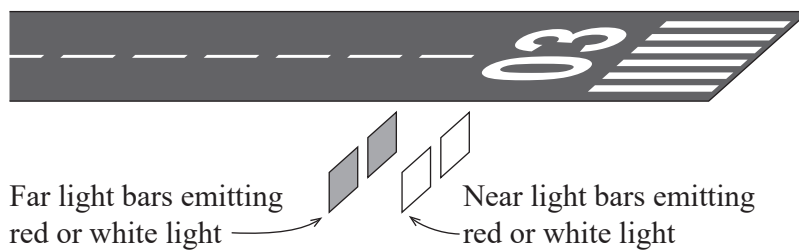
The primary reason airline employees are prohibited from consuming alcohol prior to their shift is

- (A) it can affect safety.
- (B) alcohol is a stimulant.
- (C) alcohol has adverse effects at altitude.
- (D) to maintain a positive image of the airline.

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QUESTION 6

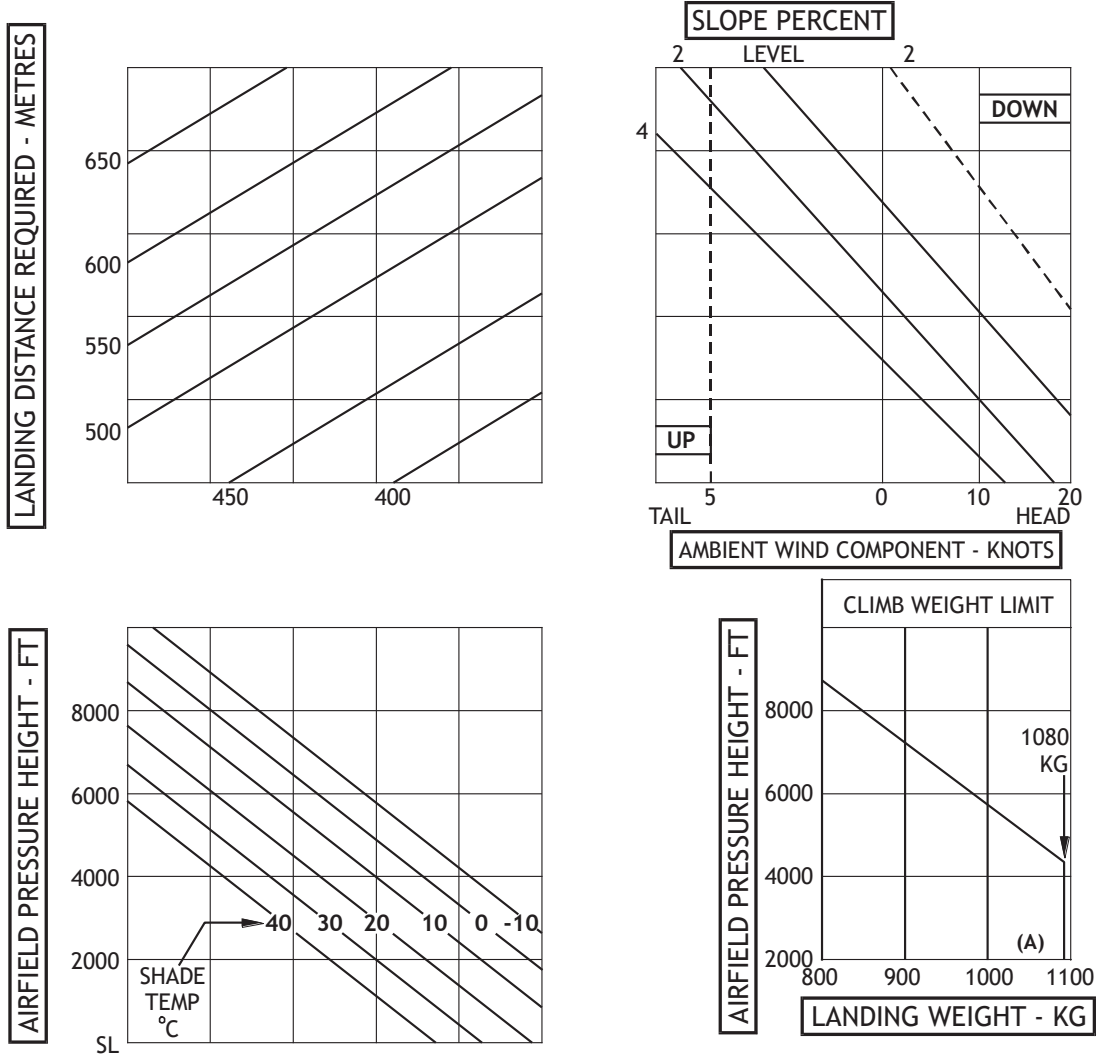
Identify the aircraft aid shown.



- (A) instrument landing system (ILS)
- (B) primary surveillance radar (PSR)
- (C) secondary surveillance radar (SSR)
- (D) visual approach slope guidance systems (VASIS)

QUESTION 7

Use the landing chart to determine the landing distance required if the airfield has a pressure height of 4000 ft in ISA conditions with an upslope of 2° with a 10 kt headwind.



- (A) 440 metres
- (B) 455 metres
- (C) 470 metres
- (D) 550 metres

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QUESTION 8

A pilot recalled experiencing tunnel vision and greyout when conducting a steep turn.

What physiological effect were they experiencing?

- (A) hypoxia
- (B) positive G force
- (C) negative G force
- (D) hyperventilation

QUESTION 9

Identify which engine type parameters are correct.

	Engine type	Advantages	Limitations
(A)	Axial flow jet	high pressure ratio light weight	expensive to manufacture small frontal area for given airflow
(B)	Turbofan	quieter than turbojets inexpensive to acquire, operate and maintain	heavier than turbojets inefficient at very high altitudes
(C)	Turbojet	low fuel consumption capable of high speeds	takes up a lot of space poor performance at slow speeds
(D)	Turboprop	efficient at lower speeds burns less fuel per seat-mile	limited forward airspeed gearing systems are heavy and can break down

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QUESTION 10

A flight is planned from 33° S 144° E to 39° S 144° E with a magnetic variation of 14° at an altitude of 9500 ft.

Use the GPWT to identify the wind direction that would be used for flight planning.

		141°E			144°E			147°E			GPWT FORECASTS (1000FT - FL140) - VT													
		PROVIDED BY AUSTRALIAN BUREAU OF METEOROLOGY												ISA										
		VALID: 0000 UTC 28 May 2022												FL/FT hPa T										
		ISSUED: 1757 UTC 27 May 2022												140 600 -13										
		DATA FORMAT: dd fff tTT												7000 800 +01										
		dd: WIND DIR TENS OF DEG TRUE												5000 850 +05										
		fff: WIND SPEED IN KNOTS												2000 950 +11										
		tTT: TEMP IN DEG CELSIUS												1000 975 +13										
		FORECAST is valid for the centre of the box																						
33°S	21	011	-01	20	010	-01	26	022	-11	28	002	00	29	005	27	003	+11	28	006	+12	24	004	+12	
	17	013	+07	17	012	+08	24	015	-03	19	006	+08	17	004		13	004	+13	09	008	+10	17	018	+10
	16	020	+11	17	019	+11	23	013	00	14	003	+13	13	002		10	018	+16	--	--	--	17	022	+15
36°S	18	016	+10	17	026	+10	21	013	+04	06	005	+14	07	009	10	018	+16	--	--	--	17	022	+17	
	14	011	+15	15	018	+15	22	010	+09	16	010	+15	11	006	--	--	--	--	--	--	17	022	+17	
	14	011	+17	15	018	+17	23	010	+10	16	010	+17	12	006	--	--	--	--	--	--	17	022	+17	
	24	015	-02	24	011	-02	26	015	-12	25	009	00	26	007	26	011	-01	27	012	00	29	014	00	
	20	016	+06	20	014	+07	24	014	-04	22	004	+07	20	003	26	002	+07	27	008	+07	26	012	+07	
	19	013	+11	19	013	+10	26	012	-01	21	004	+11	25	002	30	005	+08	29	006	+09	24	010	+11	
	23	014	+09	19	017	+10	24	012	+03	17	008	+13	08	007	09	003	+10	15	005	+08	18	012	+08	
	14	010	+13	16	014	+13	15	007	+09	14	007	+14	09	013	18	011	+12	17	018	+14	17	018	+14	
	14	010	+15	16	014	+15	25	008	+10	16	008	+16	09	013	19	011	+14	17	019	+16	17	019	+16	
	15	006	+12	16	011	+13	24	010	+09	15	007	+12	14	004	19	011	+14	17	019	+16	17	019	+16	
39°S	15	006	+14	16	011	+15	24	010	+10	16	007	+14	15	005	27	020	-02	27	021	-02	27	025	-02	
	26	015	-03	26	017	-04	28	015	-13	27	020	-03	27	021	27	020	-02	28	019	-01	27	016	-01	
	24	013	+04	24	011	+05	24	013	-04	23	013	+07	25	010	26	011	+06	25	011	+07	25	010	+07	
	21	009	+08	21	008	+10	28	011	00	27	006	+09	31	003	30	008	+08	27	012	+08	23	012	+08	
	20	007	+05	18	008	+07	28	011	00	10	007	+09	08	004	17	002	+06	20	008	+06	21	011	+07	
	19	005	+11	15	008	+12	--	--	--	16	011	+12	--	--	22	003	+11	21	013	+12	17	012	+13	
	19	004	+13	15	007	+14	--	--	--	--	--	--	--	--	23	003	+13	21	013	+14	17	013	+15	
	25	015	-03	26	017	-04	28	018	-14	27	023	-04	27	024	27	025	-03	26	025	-03	27	025	-02	
	26	015	+03	25	016	+04	24	013	-04	26	017	+05	26	017	26	019	+05	26	017	+05	26	018	+06	
	23	013	+07	22	010	+08	28	008	-01	26	009	+08	28	010	28	009	+07	29	009	+07	26	010	+06	
26	009	+04	26	010	+05	27	011	+02	24	006	+04	23	008	24	010	+05	24	008	+05	24	006	+05		
21	005	+10	20	007	+10	27	016	+08	21	005	+11	25	005	23	009	+11	24	009	+12	19	006	+13		
20	005	+12	20	008	+12	28	015	+10	21	005	+13	24	004	24	010	+13	24	009	+14	18	006	+15		
26	022	-04	26	021	-05	30	023	-14	26	024	-04	25	024	27	027	-04	27	034	-04	27	033	-04		
27	022	+02	26	022	+03	28	025	-05	25	022	+04	25	019	26	022	+03	27	022	+03	27	022	+04		
25	015	+06	25	014	+06	28	016	00	23	014	+06	23	011	26	012	+05	28	013	+06	31	011	+04		
27	013	+03	27	012	+03	27	017	00	26	014	+04	25	013	26	011	+06	30	009	+05	30	010	+04		
22	007	+08	22	008	+09	27	015	+09	23	011	+09	25	013	26	017	+10	28	011	+12	30	008	+12		
21	007	+10	21	007	+11	27	014	+11	22	010	+11	25	013	25	017	+13	27	012	+14	30	008	+14		

- (A) 015° M
- (B) 226° M
- (C) 240° M
- (D) 256° M

References

Question 1

Adapted from CASA 2024, 'Flight planning notepad', Australian Government Civil Aviation Safety Authority, <https://shop.casa.gov.au/products/flight-planning-notepad-flight-planning-notepad>. CC BY 4.0

Data source Airservices Australia, World Aeronautical Charts (WAC): Tarcoola.

Question 6

Skybrary 2024, 'Primary Surveillance Radar (PSR)', *Skybrary*, <https://skybrary.aero/articles/primary-surveillance-radar-psr>.

Question 7

Landing chart adapted from Civil Aviation Safety Authority CASA 2021, *RPL, PPL & CPL (Aeroplane) Workbook*, <https://www.casa.gov.au/rpl-ppl-and-cpl-aeroplane-workbook>. CC BY 3.0

Question 9

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Cutler, C 2017, 'How The 4 Types Of Turbine Engines Work', *Boldmethod*, <https://www.boldmethod.com/learn-to-fly/systems/the-4-types-of-turbine-engines>.

Question 10

Bureau of Meteorology 2024, Grid Point Wind and Temperature Forecasts, <http://www.bom.gov.au/aviation/charts/grid-point-forecasts/index.shtml>.

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