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# AIR TRANSPORT PILOT AEROPLANE THEORY COURSE

IND. MACH **.82** CRUISE  
PLANNING  
ALL ENGINES 2 AIRBLEEDS  
MAX CRUISE THRUST LIMITS

**BOEING 727**

FLIGHT PLANNING  
INTEGRATED RANGE  
ISA

**310** FLIGHT LEVEL

TAS 481 KNOTS  
ISA= -46.4 DEG C

GROSS WT KG	→	0	100	200	300	400	500	600	700	800	900
55000	↓	0	12	24	36	48	60	72	84	96	108

## FLIGHT PLANNING CyberExam Answers and Workings

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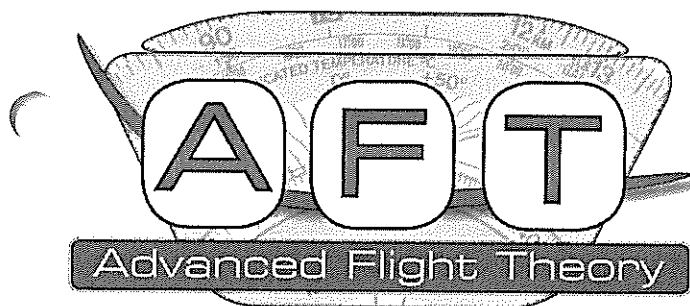
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AIR TRANSPORT PILOT  
AEROPLANE  
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FLIGHT PLANNING

## AFPA CYBEREXAM WORKED ANSWERS

### QUESTION AFPA\_001

Refer B727 Performance and Operating Handbook.

You have the following flight planning data:

Gross Weight passing FL 230 on climb ..... 79400 kg  
Cruise level ..... FL330  
Temperature ..... ISA+5  
Wind component ..... +55 kt

Your calculation of the maximum TMN cruise schedule available when you reach FL 330, and the planned initial Groundspeed at that TMN is -

TMN .82, Groundspeed 537 kt

(3 marks)

Refer B727 Performance and Operating Handbook page 2-8 and 2-9 climb performance.

GW at FL 230	79400 kg
Approx climb fuel to FL230	+2000 kg
Estimated BRW	=81400 kg so all climb figures will be extracted for 82000 kg BRW
ISA +5 Climb to FL 330 82T	= 3600 kg
ISA +5 Climb to FL 230 82T	= 2213 kg
Climb fuel FL 230 to FL330	= 1387 kg
TOC GW = GW 79400-climb	= 79400
	- 1387
	= 78013 kg

Refer Altitude capability table page 2-14. Thrust limit for FL330 ISA+5 TMN .82 is 78100 kg, therefore TMN .82 is maximum speed schedule available at TOC.

TAS for M.82 FL 330 ISA +5(-45 OAT)	= 482 kt
Wind component	+55
Groundspeed	= 537 kt

**QUESTION AFPA\_002**

Refer B727 Performance and Operating Handbook and ERC H3. A B727 flight is enroute from ALICE SPRINGS to MELBOURNE via A461 and H119. Current position over AGAGO

Inflight data:

FL ..... 330  
 TMN ..... 0.82  
 IRS wind ..... 250(M) 66 kt  
 TAT ..... -10  
 GW ..... 73200 kg

Delays departing ALICE SPRINGS have put the flight behind schedule. You wish to increase cruise schedule to TMN 0.84 as soon as possible.

## RSWT Extract

FL	-ISA	AS/LEC	LEC/NATYA	NATYA/ML
445	-56	2609062	2808058	2806555
385	-56	2611054	2710053	2809052
340	-52	2611045	2710048	2810048
300	-45	2609038	2708043	2808046
235	-32	2607524	2706030	2906034
185	-21	2603514	2703518	2804021

The distance from AGAGO and time in minutes at which TMN 0.84 is first available as a maximum speed cruise schedule respectively are closest to -

257 nm, 30 minutes

(3 marks)

SEG	FL	DEV	M	TAS	TR	WV	WC	GS	DIST	ETI	AIRD	Fuel F	Zone F	SZW	MZW	EZW
M.82	330	+10	.82	487	138	250/66	+25/-4	508	257	30.38	-	4542	2300	73200	72	70900
M.84	330	+10	.84			250/66								70900		

**QUESTION AFPA\_003**

Refer B727 Performance and Operating Handbook.

You have the following flight planning data for a sector from ADELAIDE (YPAD) to PERTH (YPPH):

Performance Limited BRW ..... 86150 kg  
Basic Weight ..... 47210 kg

Estimated fuel burn Normal Operations ..... 14500 kg  
Estimated fuel burn 1 INOP Operations ..... 15900 kg  
Estimated fuel burn Depressurised Operations ..... 16650 kg

Abnormal operations FBO is based on either continuing or returning from the Critical Point

No other performance limits apply.

ADELAIDE is ACCEPTABLE but may be considered SUITABLE if sufficient fuel is carried to cover a TEMPO (60 min) period forecast for the time of possible use.

PERTH is ACCEPTABLE but may be considered SUITABLE if sufficient fuel is carried to cover an INTER (30 min) period forecast for your arrival.

Your calculation of the maximum payload that may be carried is -

15850 kg

(2 marks)

FBO	Normal Ops	1 INOP	Depressurised
	14500 kg	15900	16650
+	1450 kg (10%)	1590	nil
+	3300 kg (FR)	1500	2250
+	2000 kg (holding YPPH)	4000 (hold YPAD)	nil
+	<u>100 kg (T/S)</u>	<u>100</u>	<u>100</u>
	21350	23090	19000

= 23090 kg Fuel on Board (FOB) at BRW is the minimum required

Note that 60 min WX holding is required for 1 INOP operations to cover the possibility of engine failure prior to the CP and a return to YPAD, but only 30 min holding is required for the normal ops plan to YPPH. Normal operations only requires a SUITABLE destination and does not need to consider a return to departure.

BRW will be least of...

Performance Limited BRW	86150 kg
MLW 30 flap 72600 + normal ops FBO 14500	87100 kg
MZFW 63500 + minimum FOB 23090	86590 kg

BRW	86150
- FOB	<u>23090 kg</u>
= ZFW	63060 kg
- BW	<u>47210 kg</u>
= P/L	15850 kg

## QUESTION AFPA\_004

Refer B727 Performance and Operating Handbook.

You obtain a positive fix inflight and have the following inflight data:

FOB ..... 15900 kg  
Payload ..... 13000 kg  
BW ..... 47000 kg

Destination Weather: ACCEPTABLE, SUITABLE with 60 min holding fuel

Departure Weather: SUITABLE, requires 20 min operational holding for Traffic purposes

Your calculation of the amount of fuel available for flight from the current position to the PNR/1-INOP and return to departure aerodrome and the final landing weight respectively are -

PNR/1-INOP fuel available 13090 kg and LW 62809 kg

(1 mark)

$$\begin{array}{rcl} & 15900 \text{ kg FOB} & \\ - & \underline{1500 \text{ kg (1-INOP FR)}} & \\ = & \underline{14400 \text{ kg (110\% Flight Fuel)}} & \\ & 1.1 & \\ = & 13091 \text{ kg Flight Fuel (no T/S required, no Traffic holding required for 1 INOP)} & \\ \\ \text{GW} & 75900 \text{ kg (BW + Payload + FOB)} & \\ - & \underline{13091 \text{ kg (Flight Fuel)}} & \\ = & 62809 \text{ kg (Landing Weight)} & \end{array}$$

### QUESTION AFPA\_005

A B727 is climbing to FL 330. Passing FL 230 GW is 75500 kg. Conditions for the climb ISA+10.  
The Maximum cruise TMN available on arrival at FL330 without exceeding cruise thrust limits is -  
.82

(1 mark)

$$\begin{array}{rcl} \text{GW @ FL 230} & = & 75500 \text{ kg} \\ - 1250 \text{ climb fuel FL 230 to FL330} & & \underline{-1250 \text{ (ISA+10 BRW 78T)}} \\ & & 74250 \end{array}$$

Refer P2-14. Thrust limited GW for TMN .82 = 75100 kg so .82 is OK

### QUESTION AFPA\_006

Refer B727 Performance and Operating Handbook.

You are making a one engine inoperative descent to your destination aerodrome, when an emergency at the aerodrome forces ATC to instruct you to hold in a racetrack holding pattern at FL230 for 45 minutes.

Holding data is:

GW at holding pattern entry ..... 72000 kg  
Temperature ..... ISA+10

The average holding pattern fuel flow and TAS respectively are -

3883 kg/hr and 333 kt

(2 marks)

Refer to the holding table on page 5-14 of the B727 POH.

GW 72000 kg (use this weight to estimate a mid zone weight).  $72000 - (.75/4000)/2 = 70500$ .  
Round to EMZW of 71000 kg

Interpolate to the nearest 1000 kg:	at FL250 at 71t = 1926 kg/hr/engine	IAS 234.8 kt
	at FL200 at 71t = <u>1870 kg/hr/engine</u>	IAS <u>233.6 kt</u>
	difference in 5K = <u>56 kg</u>	<u>1.2 kt</u>
	divided by 5K <u>5K</u>	<u>5K</u>
	= 11.2 kg/hr per 1000 ft change in FF	= 0.24 kt per 1000 kg

At FL230 at Gross weight of 71t Fuel Flow will be the FL200 71t Fuel flow of 1870 kg/hr + (3 x 11.2 kg/hr) = 1903.6

1903.6 kg/hr/engine x 2 = 3807.2 kg/hr in ISA + 2% (ISA+10) = 3883.3 kg/hr

FL230 71t IAS will be the FL200 71t IAS of 233.6 + (3 x .24 kt) = 234 kt IAS  
From CR3 234 IAS at FL230 = TMN 0.545. AT ISA+10 (-21 OAT) TMN .545 = 336 TAS



### QUESTION AFPA\_007

Refer B727 Performance and Operating Handbook.

You have the following data:

GW ..... 75000 kg

SAT ..... -60 C

Cruise level ..... FL330

Speed ..... Turbulence Penetration Speed

Wind Component ..... +65 kt

The planned Groundspeed is -

514 kt

(1 mark)

Refer B727 POH page 1-2 and 2-11 to 2-13 buffet boundary charts for turbulence penetration speed.

Turbulence penetration speed is  $280/.8M$ , whichever is lower.

At FL330 Turbulence penetration speed is 280 KIAS.

This equates to TMN 0.79. At SAT-60C TMN .79 = 449 KTAS.

With WC+65 kt the groundspeed is  $449+65 = 514$  kt.

### QUESTION AFPA\_008

Refer B727 Performance and Operating Handbook.

You have the following data:

GW ..... 70000 kg

Cruise level ..... FL350

Airspeed ..... Turbulence penetration speed

In moderate turbulence, your margin (in knots) above and below initial buffet boundaries is -

32 kt above and 7 kt below initial buffet

(1 mark)

Refer B727 POH page 2-12 (moderate turbulence buffet boundary).

At 70T at FL350 at 0.80M the margin is 32 kt above the stall and 7 kt below the high speed buffet.

# QUESTION AFPA\_009

Refer B727 Performance and Operating Handbook and ERC H1.

You are on track from BRISBANE to MELBOURNE via Q94.

At 1725Z you are overhead PARKES and have the following inflight data:

Cruise level ..... FL350  
 TMN ..... 0.79  
 Temperature ..... TAT of -18  
 Wind from IRS ..... 280M/65  
 Gross weight ..... 72400 kg

At this time ATC advise that you will be required to hold at 95 track miles from MELBOURNE.

To minimise time in the holding pattern, you decide to cruise from PARKES to the holding position at 95 nm from MELBOURNE at holding speed.

Your calculation of FBO between PARKES and the holding point is -

2250 kg

(2 marks)

SEG	FL	DEV	M	TAS	TR	WV	WC	GS	DIST	ETI	AIRD	Fuel F	Zone F	SZW	MZW
PKS									(335)						
95ML	350	+9	0.72	423	206	280/65	-19/-4	400	240	36		3750	2250	72400	71
TMN is computed from 241 IAS in the holding table p4-4 for FL350 71T EMZW															
Fuel flow is 95% of the fuel flow from the holding table for straight and level															



## QUESTION AFPA\_010

Refer B727 Performance and Operating Handbook and RSWT Extract.

### RSWT Extract

FL	-ISA	YPAD / HUSKY / HITCH / YPPH		
445	56	2905565	2905565	2905565
385	56	2905052	2905052	2905052
340	52	2707040	2707040	2707040
300	45	2708532	2708532	2708532
235	32	2802519	2802519	2802519
185	21	3202517	2903016	2703511

You are planning a flight from PERTH (YPPH) to ADELAIDE (YPAD) via Y135 at a constant TMN of 0.80.

EMZW for the cruise zone HITCH to HUSKEY is 63350 kg

Your determination of the flight level which will result in the best SGR for the zone is -

FL370

(3 marks)

SEG	FL	DEV	M	TAS	TR	WV	WC	GS	DIST	ETI	AIRD	Fuel F	Zone F	SZW	MZW
CRZ	370	+4	0.8	463	095	287/50	+49	512	SGR 7.19 kg/nm			3681			63
CRZ	330	+12	0.8	477	095	267/70	+69	546	SGR 7.24 kg/nm			3955			63
CRZ	290	+13	0.8	486	095	267/85	+84	570	SGR 7.73 kg/nm			4410			63
CRZ	270	+13	0.8	489	095	272/49	+49	538	SGR 8.72 kg/nm			4691			63

**QUESTION AFPA\_011**

Refer B727 POH, ERC H1 and RSWT Extract.

You are on descent into MELBOURNE (YMML) from BRISBANE (YBBN) via H66, after suffering an en-route cabin pressurisation failure. Approaching 1500 ft overhead MELBOURNE one engine fails. Your GW overhead YMML at 1500 ft is 69600 kg.

The weather conditions at MELBOURNE make it ACCEPTABLE, while the SYDNEY (YSSY) TAF indicates SYDNEY to be SUITABLE.

You have the following inflight data:

TAC distance ..... CULLIN to SYDNEY is 101 nm

**RSWT EXTRACT**

FLIGHT LEVEL	-ISA	YMML/YSSY
235	-32	2607524
185	-21	2503514

Your calculation of the GW for a landing at SYDNEY, after flying from MELBOURNE via Y59, is -  
64550 kg

(5 marks)

SEG	FL	DEV	M	TAS	TR	WV	WC	GS	DIST	ETI	AIRD	Fuel F	Zone F	SZW	MZW
1500 ft									(383)					GW	
TOC	clb	+7	-	300	035	24035	+32	-	55	10	50	-	1162	69600	
TOD	130	+7	0.567	363	045	24035	+33	396	270	41	-	4352	2967	68438	67
SY	des	-	-	230	050	24035	+35	-	58	13	50		520	65471	
APP													400	64951	
												FF	5049	64551	LW

ISA

ISA + 10

130

6

5.5 = 5.75

130

7.5

6.5 = 7

1500

2

2 = 2

1500

2

2 = 2

= 5

= 3.75

1125

1050 = 1087.5 1050 975 = 1012.5 = 637.5

375

400

= 687.5

**QUESTION AFPA\_012**

Refer B727 Performance and Operating Handbook and ERC H3 and H1.

A flight from ADELAIDE (YPAD) to BRISBANE (YBBN) via Y19 has been planned at FL330, TMN.79.

Flight details are:

Ramp weight ..... 73350 kg  
 FOB at ramp weight ..... 13750 kg  
 CP 1 INOP position is determined to be 104 nm past ALASU  
 ETD ADELAIDE ..... 0900Z  
 ETI ADELAIDE to BRISBANE ..... 160 minutes  
 From the TAC: YPAD – UBDIB Distance 100 nm, Track 056M. PARRY – YBBN Distance 51 nm, Track 050M

TAF YPAD SUITABLE

TAF YBBN SUITABLE

**RSWT EXTRACT**

FLIGHT LEVEL	-ISA	BN/ENPAG	ENPAG/MIA	MIA/AD
445	-56	2609062	2808058	2806555
385	-56	2611054	2710053	2809052
340	-52	2611045	2710048	2810048
300	-45	2609038	2708043	2808046
235	-32	2607524	2706030	2906034
185	-21	2603514	2703518	2804021

In planning for an engine failure at the CP 1 INOP position, the planned LW and the planned FOB on landing at BRISBANE respectively are -

64298 kg LW and 4698 kg FOB

(4 marks)

SEG	FL	DEV	M	TAS	TR	WV	WC	GS	DIST	ETI	AIRD	Fuel F	Zone F	SZW	MZW
AD									888					BRW	
TOC	/	-2	-	369	057	281/60	+43/-2	410	137	20	123	-	2650	73200	-
CPdp	330	+4	.79	463	055	260/100	+91/-2	552	264	28.7	-	4066	1944	70550	70
GUMAP	270	+2	.699	419	047	260/80	+66/-1	484	132	16.4		4181	1140	68606	68
TOD	270	+7	.693	419	041	249/90	+79/-2	496	255	30.7		4092	2104	67440	66
BN	\	-	-	273	035	249/35	+28	301	100	20	91		630	65336	
APP													400	64706	
	FOB @ BRW = 13600 – 8894 FBO = 4706 FOB @LW										Flight Fuel		8894	64306	LW

### QUESTION AFPA\_013

Refer B727 Performance and Operating Handbook.

You are passing FL140 on climb to FL350, when you discover that the tail skid has failed to retract.

Flight data is:

Temperature ..... ISA+5 at all levels  
GW passing FL140..... 67650 kg

The maximum initial cruise TMN you could maintain is –  
.8

(2 marks)

Refer to the Climb Performance tables p 2-8 and 2-9. Using GW at FL140, determine approximate climb fuel to FL140 – about 1075 + 25% for the extended tail skid = 1344 kg.

Determine approximate BRWof 68994 kg(GW at FL140 67650 + 1344 = 68994)

Climb Fuel to FL 350 ISA+5 68T=2600  
Climb Fuel to FL 140 ISA+5 68T-1075  
Climb Fuel FL140 to FL350= 1525 kg + 25%  
=1906 kg

TOC GW = 67650 kg  
- climb fuel- 1906  
= 65744 kg

Refer altitude capability table p2-14. Thrust limit for ISA +5 TMN.8 = 74800 kg - 9000 kg (fortail skid extension as per penalty on P 5-3) = 65800 kg so max speed is TMN .8.

## QUESTION AFPA\_014

Refer B727 POH.

You have just departed DARWIN (YPDN) for BRISBANE (YBBN) when the undercarriage fails to retract. You elect to continue climbing to A100 and then dump sufficient fuel to allow a return to DARWIN, landing at MLW. There are no performance restrictions on landing.

You have the following data:

Ramp weight ..... 84400 kg  
Temperature ..... ISA+10 at all levels

You will dump from tanks 1, 2 and 3 with all boost pumps on and conduct all dumping operations at A100.

Your calculation of the minimum quantity of fuel to be dumped and the minimum ETI for the flight respectively are -

8200 kg to dump and ETI 28 minutes

(2 marks)

Ramp Weight	84400 kg
	- 150 kg (Start/Taxi)
BRW	= 84250 kg
MLW	= 72600 kg (assume 30 flap)
Reduction in Fuel	= 11650 kg between BRW and Landing Weight
Climb	- 1150 kg and 7 min + 20% = 8.4 min
Descent	- 940 kg and 12 min (+ 450 kg gear down descent)
App	- 400 kg
	9160 kg fuel to dump and burn at 10000 ft

Divided by (1050 kg/min + 130 kg/min) dump rate and cruise rate at A100 gear down from cruise tables.

$$\frac{9160 \text{ kg}}{1170 \text{ kg/min}}$$

$$= 7.76 \text{ min} \times 1050 \text{ kg/min} = 8150 \text{ kg to dump}$$

**QUESTION AFPA\_015**

Using a forecast average wind component of -30 kt, the TOC position for a B727 aircraft is found to be 127 nm from the departure aerodrome. Climb time is 23 minutes.

If the actual average wind component is +20 kt, the distance from departure to the actual TOC is –

146 nm

(2 marks)

Remove the original headwind correction:  $ETI/60 \times \text{wind component}$   
 $= 23/60 \times -30 \text{ headwind}$   
 $= -11.5$

nil wind position  $= 127 + 11.5 \text{ (removing the correction)}$   
 $= 138.5 \text{ nm}$

Apply the tailwind correction  $= 23/60 \times +20$   
 $= +7.7$   
 $= 138.5 + 7.7$   
 TOC position  $= 146.2 \text{ nm}$

or

Make a single correction for the resultant  $= 23/60 \times +50 \text{ (resultant of removing headwind and adding tailwind)}$   
 $= +19$   
 TOC position  $= 127 + 19.2$   
 $= 146.2 \text{ nm}$

**QUESTION AFPA\_016**

A flight is being planned in a B727 from DARWIN to PORT MORESBY via route B598.

The planned details are:

GW overhead IDELU ..... 72500 kg  
 FL ..... 330  
 TMN ..... LRC  
 Forecast for FL340 ..... W/V 170T/14  
 SAT for FL340 ..... -39 C

The planned FBO from IDELU to HORN ISLAND is closest to -

3181 kg

(2 marks)

SEG	FL	DEV	M	TAS	TR	WV	WC	GS	DIST	ETI	AIRD	Fuel F	Zone F	SZW	MZW
HID	330	+13	.791	473	076	165/14	--	473	355	45		4239	3181	72500	71

**QUESTION AFPA\_017**

Refer B727 Performance and Operating Handbook, ERC H2 and RSWT Extract.

You have the following inflight planning data at time 0200Z, cruising from DARWIN (YPDN) to ADELAIDE (YPAD) via A461 and J251:

Position ..... 341 deg M/200 DME ALICE SPRINGS (YBAS) on A461  
 FL ..... FL290  
 TMN ..... 0.80  
 GW ..... 73300 kg  
 FOB ..... 11750 kg

**RSWT EXTRACT**

FL	-ISA	AD/WR	WR/AS	AS/BOYDI	BOYDI/DN
445	-56	2905557	2807061	2806065	2902566
385	-56	2905052	2808050	2806552	2702052
340	-52	2904549	2707544	2707040	2702540
300	-45	3003543	2706038	2706032	2802031
235	-32	3102530	2804526	2706019	2702517
185	-21	3202517	2903016	2703511	2701507

25 minutes after the 0200Z fix, ATC advise of delays in landing clearance for ADELAIDE. Landing clearance will not be available until 0430Z and you are to hold at WOOMERA to plan for a landing at ADELAIDE at 0430Z.

At 0225Z You reduce speed to LRC TMN for the remainder of the cruise to save fuel.

The period for which you will need to hold at WOOMERA at FL290 to arrive at ADELAIDE at the target time of 0430Z is -

28 min

(5 marks)

SEG	FL	DEV	M	TAS	TR	WV	WC	GS	DIST	ETI	AIRD	Fuel F	Zone F	SZW	MZW
0200Z															
0225Z	290	+13	0.80	487	161	265/60	+13	500	208	25	-	4680	1950	73300	72
WR	290	+7	.76	456	154	264/60	+20/-3	473	459	58.23	-	4180	4056	71350	69
TOD	290	+2	.754	448	155	293/35	+25	473	140	17.76	-	4041	1196	67294	67
AD	\	-	-	277	145	312/25	+24		105	21	97		640		
APP									ETI	2:02			400		
									time	02:00					
									ETA	04:02					
									target	04:30					
									hold	=28					



**QUESTION AFPA\_018**

Refer B727 Performance and Operating Handbook.

You have the following preflight data:

Cruise level ..... FL310  
 BRW..... 73550 kg  
 Temperature ..... ISA+15  
 TMN ..... 0.82

In the event of an engine failure on takeoff, the maximum one engine inoperative altitude capability of the aircraft for a Westerly track is -

FL 240

(1 mark)

Try FL 240 as an initial guess.

1 INOP Climb Fuel to FL 240 = 3225 kg (note error in climb table ISA+20 76T).

BRW 73550 – 3225 = 70325 kg TOC GW.

Refer to the B727 POH page 5-6 (1-INOP Altitude Capability)

MAX FL at 70T (TOC GW) at ISA+15 = 24200 ft.

**QUESTION AFPA\_019**

Refer B727 POH, ERC H1, H3, RSWT. You have the following planning data for a flight from ADELAIDE (YPAD) to BRISBANE (YBBN) via Y19:

Ramp weight ..... 76600 kg  
 FOB at startup ..... 15450 kg  
 Planned ETI ..... 138 minutes  
 Cruise level ..... highest available flight level  
 Mach number ..... 0.79M

From the TAC:

YPAD – UBDIB Distance 100 nm, Track 056M. PARRY – YBBN Distance 51 nm, Track 050M

The following WX information is valid:

TAF YPAD ACCEPTABLE, SUITABLE with 30 min Weather Holding.  
 TAF YBBN SUITABLE

**RSWT EXTRACT**

FL	-ISA	BN/ENPAG	ENPAG/MIA	MIA/AD
445	-56	2609062	2808058	2806555
385	-56	2611054	2710053	2809052
340	-52	2611045	2710048	2810048
300	-45	2609038	2708043	2808046
235	-32	2607524	2706030	2906034
185	-21	2603514	2703518	2804021

Assuming an engine failure at the PNR/1-INOP, the distance to the PNR/1-INOP from ADELAIDE and the FOB on landing at ADELAIDE respectively are -

PNR/1-INOP 463 nm from ADELAIDE and FOB landing 4664 kg

(5 marks)

**QUESTION AFPA\_019** (continued)

SEG	FL	DEV	M	TAS	TR	WV	WC	GS	DIST	ETI	AIRD	Fuel F	Zone F	SZW	MZW
AD									(463)					BRW	
TOC	clb	-2	-	371	058	282/60	+43/-2	412	144	21	130	-	2800	76450	
463nm	330	+4	0.79	463	047	260/100	+84/-3	544	319	35	-	4163	2441	73650	72/72
TOD	260	+1	0.693	415	233	265/60	-52/-	363	382	63	-	4162	4380	71209	69/69
AD	des	-	-	276	237	272/40	-33/-1	242	81	20	92		625	66829	
APP													400	66204	
												FF =	10646		
												Avail =	10636		
												FF	10646	65804	
Winds for FL 260 use FL235 weather												deficit	-10		
FOB 15450 - 150 ST - 1500 FR - 100 TS - 2000 holding /1.1 = 10636															

-10 deficit  
 (SGR OUT 7.65 + SGR HOME 11.46) = .5 nm too far

So PNR = 463 nm -.5 nm = 462.5 from ADELAIDE

FOB on landing will be total fuel of 15450 kg at start - 150 = 15300 - 10636 kg = 4664 kg on landing.

**QUESTION AFPA\_020**

Refer B727 POH.

Given a BRW of 78000 kg under ISA conditions, the average rate of climb to climb from FL130 to FL330 is -

1290 ft/minute

(1 mark)

Refer to B727 POH page 2-8 BRW 78t.

Climb from MSL to FL330 = 22.5 min  
 - Climb from MSL to FL130 = - 7 min  
 Climb from FL130 to FL330 = 15.5 min to climb 20000 ft

20000 ft  
 15.5 min = 1290 ft/min rate of climb

**QUESTION AFPA\_021**

Refer B727 POH, ERC H3 and RSWT Extract.

You have the following planning/actual data for a flight from ADELAIDE (YPAD) to PERTH (YPPH) via Q12 and J68:

Cruise level ..... FL350  
 Mach number ..... 0.79M  
 Ramp weight ..... 78250 kg  
 FOB on the ramp ..... 19450 kg  
 ATD ..... 0330Z  
 ETI ..... 163 minutes  
 Planned GW at top of climb ..... 74487 kg  
 Planned GW at LESON ..... 71854 kg  
 Planned GW at LUCRE ..... 68450 kg  
 Planned GW at ESPERANCE ..... 66820 kg

TAC distance.....GILES - ADELAIDE 36 nm

Both PERTH and ADELAIDE are SUITABLE for the period of possible use.

**RSWT EXTRACT**

<b>FL</b>	<b>-ISA</b>	<b>YPAD/ISLAV</b>	<b>ISLAV/CRICK</b>	<b>CRICK/YPPH</b>
445	-56	2705762	2705862	2705862
385	-56	2704657	2704456	2704957
340	-52	2603948	2703948	2604148
300	-45	2603938	2703738	2703838
235	-32	2603322	2702922	2703322
185	-21	2602410	2702309	2702509

The distance, measured from PERTH, to the location of the PNR/DP for a return to ADELAIDE, is closest to -

519 nm

(4 marks)

Fuel on Board at the Ramp	=	19450 kg
	-	150 kg start/taxi
	-	2250 kg FR
	-	<u>100 kg T/S</u>
Flight fuel		16950 at BR

Start at LUCRE (673 nm AD) as a possible PNR and plan back from LUCRE depressurised to see if that burns 16950 kg from BRW.

**QUESTION AFPA\_021** (continued)

SEG	FL	DEV	M	TAS	TR	WV	WC	GS	DIST	ETI	AIRD	Fuel F	Zone F	SZW	MZW
AD-LESON								try	(673)				6246	78100	
LUCRE	310		0.79						326				3404	71854	
LESON	130	+12	0.59	380	096	267/23	+23	403	326	49	-	4820	3899	68450	67
TOD	130	+11	0.59	379	084	254/24	+24	403	292		-	4725	3424	64551	63
AD	des	-	-	230	077	252/24	+24	-	55	13	50		520	61127	
APP													400		
						SGR	3404	10.44	SGR	4820	11.96	FF	17893		
						Out	326		home	403		avail	16950		

Available flight fuel at BRW 16950 kg – 17893 kg fuel burnt to LUCRE and back = 943 kg too far

943 kg too far  
SGR OUT 10.44 + SGR HOME 11.96 = 42 nm too far

PNR = 673 nm - 42 nm = 631 nm from AD (1150 total - 631 = 519 nm PH)

**QUESTION AFPA\_022**

Refer B727 POH.

Given the following data:

Holding level ..... FL220  
Holding ETI ..... 45 minutes  
Start zone weight ..... 77500 kg  
SAT ..... -19 C

Your determination of the average holding fuel flow and TAS respectively are -

FF 4115 kg/hr and TAS 340 kt

(2 marks)

The average fuel flow is dependent on the estimated mid zone weight. At a start zone weight of 77500 kg for 45 min, the fuel burn will be approximately 4000 kg/hr so 3000 kg for 45 min so 1500 kg half way through. The EMZW will therefore be 77500 kg SZW - 1500 kg = 76000 kg.

Enter the holding table on page 4-4 of the B727 POH, at 76t at FL220 and interpolate to the nearest 1000 kg and 1000 ft.

Interpolate to the	at FL250 at 76t = 1328 kg/hr/engine	IAS 243.6 kt
nearest 1000 kg:	at FL200 at 76t = <u>1356 kg/hr/engine</u>	IAS <u>241.6 kt</u>
	difference in 5t = <u>28 kg</u>	difference in 5T <u>2 kt</u>
	divided by 5t <u>5T</u>	divided by 5T <u>5T</u>
	= 5.6 kg/hr per 1000 ft change in FF = 0.4 kt per 1000 ft	

At 76t the FL220 Fuel Flow will be the FL200 Fuel flow of 1356 kg/hr - 2 x 5.6 kg/hr = 1345 kg/hr  
1345 kg/hr/engine x 3 = 4034 kg/hr in ISA + 2% (ISA+10) = 4115 kg/hr

IAS will be the FL200 IAS of 241.6 + 2 x 0.4 kt = 242.4 kt IAS (0.55M = 341 TAS).

### QUESTION AFPA\_023

Given the following data:

IAS ..... 310 kt  
SAT..... -36 C  
QNH ..... 1013 HPA

The pressure altitude that would give a Mach Number equivalent to 0.78M is -  
27500 ft

(1 mark)

Pressure Altitude of 27500 ft equates to 0.78M at IAS 310 anytime regardless of SAT (CR3).

### QUESTION AFPA\_024

Refer B727 POH - 1.3 G buffet boundary chart.

Given the following data:

Holding level ..... FL310  
Gross weight ..... 70000 kg

The minimum IAS available is closest to -  
220 kt

(1 mark)

Refer B727 POH Buffet Boundary Graph page 2-12.

**QUESTION AFPA\_025**

Refer B727 POH and RSWT Extract.

**RSWT EXTRACT**

<b>FL</b>	<b>-ISA</b>	<b>YPAD/HUSKY/HITCH/YPPH</b>		
445	-56	2905565	2905565	2905565
385	-56	2905052	2905052	2905052
340	-52	2707040	2707040	2707040
300	-45	2708532	2708532	2708532
235	-32	2802519	2802519	2802519
185	-21	3202517	2903016	2703511

You are planning a flight from ADELAIDE (YPAD) to PERTH (YPPH) at a constant Mach number of 0.80M.

Your determination of the flight level, which will result in the highest ground speed is -

FL385

(2 marks)

FL300	TAS 484 kt	- 85 kt	= GS 399 kt
FL340	TAS 476 kt	- 70 kt	= GS 406 kt
<b>FL385</b>	<b>TAS 464 kt</b>	<b>- 45 kt</b>	<b>= GS 419 kt</b>
FL445	TAS 450 kt	- 50 kt	= GS 400 kt

**QUESTION AFPA\_026**

A B727 is 155 DME from departure maintaining FL150 at a Gross Weight of 79200 kg.

A climb is commenced at this position to FL330.

The Gross Weight and distance from departure at which the aircraft will reach top of climb with a 50 kt headwind component on climb in ISA+5 conditions is closest to -

77275 kg, 276 nm

(2 marks)

Gross Weight at FL150 is 79200 kg.

BRW would have been 79200 + fuel used to FL150 (approximately 1425 kg) = BRW 80625 kg

Interpolate ISA+5 climb with tables on page 2-8 and 2-9 at 80 T BRW

ISA +5 Climb to FL330 80T	3350 kg	172 nm	27 min
subtract Climb to FL150	<u>-1425 kg</u>	<u>- 36.5 nm</u>	<u>9 min</u>
Climb from FL150 to 330	1925 kg	135.5 nm	18 min
subtract wind effect (18 min/60 x -50)		<u>- 15 nm</u>	
	1925 kg	120.5 gnm	18 min
Add 155 DME		<u>+155</u>	
		275.5 DME from departure	
GW of 79200-1925 kg		= 77275 kg GW	

**QUESTION AFPA\_027**

Refer B727 Performance and Operating Handbook.

You have the following flight planning data for a sector from PERTH (YPPH) to DARWIN (YPDN):

Performance Limited BRW YPPH ..... 87250 kg  
 Performance Limited LW YPDN ..... 70400 kg  
 Basic Weight ..... 47330 kg

Planned Flight Fuel Normal Operations ..... 16750 kg  
 Planned Flight Fuel 1 INOP Operations ..... 18220 kg  
 Planned Flight Fuel Depressurised Operations ..... 19990 kg

Abnormal operations FBO is based on either continuing or returning from the Critical Point  
 No other performance limits apply.

PERTH is ACCEPTABLE but may be considered SUITABLE if sufficient fuel is carried to cover a TEMPO (60 min) period forecast for the time of possible use.

DARWIN is ACCEPTABLE but may be considered SUITABLE if sufficient fuel is carried to cover an INTER (30 min) period forecast for your arrival. DARWIN also requires 25 min holding for TRAFFIC purposes.

Your calculation of the maximum payload that may be carried is –

14178 kg

(2 marks)



**QUESTION AFPA\_027** (continued)

	Normal Ops	1 INOP	Depressurised
FBO	16750 kg	18220	19990
+	1675 kg (10%)	1822	nil
+	3300 kg (FR)	1500	2250
+	2000 kg (holding YPDN)	4000 (hold YPPH)	nil
+	1666 kg (TFC YPDN)	nil	nil
+	<u>100 kg (T/S)</u>	<u>100</u>	<u>100</u>
	25491	25642	22340

= 25642 kg Fuel on Board (FOB) at BRW is the minimum required

Note that 60 min WX holding is required for 1 INOP operations to cover the possibility of engine failure prior to the CP and a return to YPPH, but only 30 min holding is required for the normal ops plan to YPDN. Normal operations only requires a SUITABLE destination and does not need to consider a return to departure.

BRW will be least of ...

Performance Limited BRW	87250 kg
Performance Limited LW 70400 + normal ops FBO 16750	87150 kg
MZFW 63500 + minimum FOB 25642	89142 kg

BRW	87150
- FOB	<u>25642 kg</u>
= ZFW	61508 kg
- BW	<u>47330 kg</u>
= P/L	14178 kg

**QUESTION AFPA\_028**

Refer B727 POH.

During normal cruise an emergency forces you to divert to a nearby SUITABLE airfield (no performance limitations).

You have the following inflight planning data:

Gross weight ..... 83100 kg  
 Fuel on board ..... 15300 kg  
 Fuel distribution ..... equal between Tanks 1, 2 and 3

Ignoring time and fuel burnt during dumping and descent, your calculation of the time required to dump sufficient fuel to allow you to land safely is closest to -

10 minutes

(2 marks)

Gross Weight	83100 kg
Landing Weight	-72600 kg
Fuel to lose	10500 kg
Dump rate	1050 kg/min = 10 minutes

**QUESTION AFPA\_029**

Refer B727 Performance and Operating Handbook and ERC H3.

You are en-route from PERTH (YPPH) to ALICE SPRINGS (YBAS) via Y69, when a Yaw Damper fails. In flight details are:

Position ..... overhead SKIPA  
 Gross weight ..... 75800 kg  
 Cruise level ..... FL290  
 TMN ..... 0.84  
 TAT ..... -3 degrees C  
 Wind velocity ..... 290T/115 from the IRS – Use this for all cruise and descent

You elect to continue the flight at FL290.

Your calculation of the average ground speed from your present position (SKIPA) to the top of descent is closest to -

510 kt

(3 marks)

SEG	FL	DEV	M	TAS	TR	WV	WC	GS	DIST	ETI	AIRD	Fuel F	Zone F	SZW	MZW
SKIPA									(450)						
TOD	290	+7	0.73	438	060	286115	+80/-8	510	323	38				75800	
YBAS				300	065	286115	+81 <sup>-10</sup>		127	21	101		640		
APP													400		

### QUESTION AFPA\_030

Refer B727 POH.

You have the following inflight data:

Cruise level ..... FL350  
Turbulence ..... moderate  
Gross weight ..... 70000 kg

Your determination of the airspeed for low speed buffet onset is -  
237 kt

(1 mark)

Refer B727 POH Buffet Boundary Graph.

### QUESTION AFPA\_031

Refer B727 Performance and Operating Handbook.

You have the following inflight data:

Gross weight ..... 80000 kg  
Turbulence ..... moderate  
TMN ..... Recommended Turbulence Penetration Speed  
Temperature ..... ISA +10

Your determination of the highest altitude you could maintain is closest to -  
FL310

(2 marks)

Refer B727 POH Buffet Boundary Graph pages 2-12 and 2-14 Altitude Capability table.

### QUESTION AFPA\_032

Refer B727 POH.

You have the following data:

Gross weight ..... 68000 kg  
Cruise level ..... FL350  
Mach number ..... 0.82M

Your determination of the highest TAT permitted before the aircraft exceeds maximum cruise thrust limits is -

-10 degrees C

(1 mark)

Refer B727 POH page 3-99 0.82M cruise table at 68000 kg.

### QUESTION AFPA\_033

Refer B727 Performance and Operating Handbook.

You are passing 1500 ft on climb to FL310, when you discover that the tail skid has failed to retract.

Flight data is:

Temperature ..... ISA+5 at all levels

BRW ..... 76000 kg

The maximum initial cruise TMN you could maintain is -

.82

(2 marks)

Refer B727 POH pages 2-8 and 2-9, 2-14 altitude capability and tail skid extension procedure (9000 kg thrust limit penalty) page 5-3.

Climb to FL310 from BRW 76T ISA+5 = 2750 kg +25% for extended tail skid = 3438 kg  
TOC GW = 76000 - 3438 kg = 72562 kg.

Thrust limit for TMN .82 ISA +5 is 83700 – 9000 kg (thrust limit penalty for tail skid) = 74700 kg.  
Therefore TMN .82 is max speed available.

**QUESTION AFPA\_034**

Refer B727 Performance and Operating Handbook.

You have the following flight planning data for a sector from PERTH (YPPH) to ALICE SPRINGS (YBAS):

Performance Limited BRW ..... 85650 kg  
 Performance Limited LW ..... 69650 kg  
 Basic Weight ..... 46920 kg

Estimated fuel burn Normal Operations..... 13650 kg  
 Estimated fuel burn 1 INOP Operations..... 14820 kg  
 Estimated fuel burn Depressurised Operations..... 16250 kg

Abnormal operations FBO is based on either continuing or returning from the Critical Point  
 No other performance limits apply.

PERTH is ACCEPTABLE but may be considered SUITABLE if sufficient fuel is carried to cover a TEMPO (60 min) period forecast for the time of possible use.

ALICE SPRINGS is ACCEPTABLE but may be considered SUITABLE if sufficient fuel is carried to cover an INTER (30 min) period forecast for your arrival.

Your calculation of the maximum payload that may be carried is -

14478 kg

(2 marks)

	Normal Ops	1 INOP	Depressurised
FBO	13650 kg	14820	16250
+	1365 kg (10%)	1482	nil
+	3300 kg (FR)	1500	2250
+	2000 kg (holding YBAS)	4000 (hold YPPH)	nil
+	100 kg (T/S)	100	100
	<u>20415</u>	<u>21902</u>	<u>18600</u>
=	21902 kg Fuel on Board (FOB) at BRW is the minimum required		

Note that 60 min WX holding is required for 1 INOP operations to cover the possibility of engine failure prior to the CP and a return to YPPH, but only 30 min holding is required for the normal ops plan to YBAS. Normal operations only requires a SUITABLE destination and does not need to consider a return to departure.

BRW will be least of ...

Performance Limited BRW ..... 85650 kg  
 MLW 30 flap 69650 + normal ops FBO 13650 ..... **83300 kg**  
 MZFW 63500 + minimum FOB 21902 ..... 85402 kg

BRW ..... 83300  
 - FOB ..... 21902 kg  
 = ZFW ..... 61398 kg  
 - BW ..... 46920 kg  
 = P/L ..... 14478 kg

**QUESTION AFPA\_035**

Refer B727 POH, ERC H3 and RSWT Extract.

You are en-route from ADELAIDE (YPAD) to PERTH (YPPH) via Q12 when number 2 engine fails. You have the following inflight information:

Position ..... overhead LUCRE

Gross weight ..... 75500 kg

Cruise level ..... FL310

Mach number ..... 0.79M

**RSWT EXTRACT**

<b>FLIGHT LEVEL</b>	<b>-ISA</b>	<b>ML/LONLY</b>	<b>LONLY/LODGE</b>	<b>LODGE/PH</b>
445	-56	2805053	2605554	2606058
385	-56	2806051	2506551	2406054
340	-52	2806049	2406049	2406049
300	-45	2805547	2305545	2205542
235	-32	2904536	2304032	2303527
185	-21	2804023	2403020	2602015

Your calculation of the ETI from LUCRE to the Top of Descent point is closest to -

60 minutes

(3 marks)

<b>SEG</b>	<b>FL</b>	<b>DEV</b>	<b>M</b>	<b>TAS</b>	<b>TR</b>	<b>WV</b>	<b>WC</b>	<b>GS</b>	<b>DIST</b>	<b>ETI</b>	<b>AIRD</b>	<b>Fuel F</b>	<b>Zone F</b>	<b>SZW</b>	<b>MZW</b>
LUCRE									(477)						
TOD	220	+5	0.669	412	285	23035	-20	392	403	62				75500	73
YPPH				263	300	26020	-16		74	18	79				
APP															

**QUESTION AFPA\_036**

Refer B727 Performance and Operating Handbook and ERC H3.

You are en-route from PERTH (YPPH) to ALICE SPRINGS (YBAS) via Y69, when a Yaw Damper fails.

In flight details are:

Position ..... overhead SKIPA

Gross weight ..... 75800 kg

Cruise level ..... FL290

TMN ..... 0.84

TAT ..... -3 degrees C

Wind velocity ..... 290T/115 from the IRS for cruise and descent

You elect to continue the flight at FL290. From the TAC:HERMA - ALICE SPRINGS distance 60 nm.

Your calculation of the average fuel flow from your present position (SKIPA) to the top of descent is closest to -

4140 kg/hr

(3 marks)

SEG	FL	DEV	M	TAS	TR	WV	WC	GS	DIST	ETI	AIRD	Fuel F	Zone F	SZW	MZW
SKIPA									(450)						
TOD	290	+7	0.73	438	060	286/115	+80/-8	510	324	38		4143	2632	75800	74
YBAS				289	060	285/115	+81 <sup>-11</sup>	-	126	21	101		640		
APP													400		



**QUESTION AFPA\_037**

Refer B727 Performance and Operating Handbook and ERC H1.

You are enroute from MELBOURNE (YMML) to BRISBANE (YBBN) via H66.

Initial position fix ..... overhead MDG NDB

Flight level ..... FL330

TMN ..... 0.82

TAT ..... -15 degrees C

IRS Wind ..... 240(M)/68 kt - Use for all cruise and descent

Gross weight ..... 74400 kg

TAC distance ..... MOOVI to BRISBANE is 35 nm

15 minutes after the position fix one of the airconditioning packs fails. At this time you conduct a normal descent to FL250 and then continue the flight to BRISBANE at LRC TMN to save fuel..

Your planned Landing Weight at Brisbane is closest to -

71050 kg

(4 marks)

SEG	FL	DEV	M	TAS	TR	WV	WC	GS	DIST	ETI	AIRD	Fuel F	Zone F	SZW	MZW
MDG									(379)						
TOD	330	+5	0.82	482	024	240/68	+55/-2	535	134	15		4621	1155	74400	74
FL250	\	+5	-	450	030	240/68	+58/-0	-	29	3	26		50	73245	
TOD	250	+5	.735	446	030	240/68	+58/-0	505	125	15		4558	1128	73195	73
YBBN	\	-		278	344	240/68	+17/-8	-	91	19	88		620	72067	
APP													400	71447	
													LW	71047	

**QUESTION AFPA\_038**

Refer B727 Performance and Operating Handbook and RSWT Extract.

You are cruising from PERTH (YPPH) to DARWIN (YPDN) via Y36 and T63.

Position ..... BIDAP  
 Gross weight ..... 77450 kg  
 Cruise level ..... FL 290  
 TMN ..... 0.82

CP/1 INOP position is 30 nm past BIDAP

From the TAC: PERTH - KONIL distance 173 nm. JULUP - DARWIN distance 79 nm.

The forecast for DARWIN indicates that the aerodrome will be ACCEPTABLE for the expected time of arrival but may be considered SUITABLE if 60 minutes holding is carried.

## RSWT Extract

FL	-ISA	YPPD/CIN	CIN/YPDN
445	-56	2501766	2400566
385	-56	2701550	2301450
340	-52	2801438	2301638
300	-45	2901128	2401527
235	-32	3300913	2601413
185	-21	0601304	2600704

Your calculation of the minimum required FOB at BIDAP, to complete the flight to DARWIN in the event of an engine failure at the CP/1 INOP position, is closest to -

16491 kg

(4 marks)

SEG	FL	DEV	M	TAS	TR	WV	WC	GS	DIST	ETI	AIRD	Fuel F	Zone F	SZW	MZW
604 PH									(839)						
CP1inop	290	+17	0.82	503	030	287/11	+2	505	30	4	-	5201	309	77450	77
TATUK	190	+17	.646	411	029	057/13	-12	399	323	49		4913	3977	77141	75
TOD	190	+17	.634	403	029	257/07	+5	408	415	61		4645	4725	73164	71
YDDN				263	029	257/07	+5	-	71	16	70		580	68439	
APP													400	67859	
													9991	67459	
												+	10%	1000	
												+	FR	1500	
												+	HLD	4000	
												=	FOB	16491	

**QUESTION AFPA\_039**

Refer B727 Performance and Operating Handbook, ERC H3 and RSWT Extract.

You are to plan a flight from Perth (YPPH) to Alice Springs (YBAS) via Y69.

Flight planning details are: From the TAC PERTH – BOSLI distance 91 nm. HERMA – ALICE SPRINGS distance 60 nm.

BRW ..... 76400 kg  
 FOB at BR ..... 16750 kg  
 Cruise level ..... maximum FL  
 TMN ..... 0.79  
 ETD ..... 1900Z  
 ETI ..... 198 minutes

TAFs are CAVOK

**RSWT EXTRACT**

FLIGHT LEVEL	-ISA	AS/LANOP	LANOP/KG	KG/PH
445	-56	2808562	2808058	2806055
385	-56	2810050	2809051	2807552
340	-52	2709043	2807548	2807049
300	-45	2707537	2806543	2906546
235	-32	2705525	2905028	2905531
185	-21	2803515	3003517	3004519

Your calculation of the distance to the PNR/DP, measured as a distance from YBAS, is closest to -  
 493 nm

(5 marks)

SEG	FL	DEV	M	TAS	TR	WV	WC	GS	DIST	ETI	AIRD	Fuel F	Zone F	SZW	MZW
YPPH						Try SKIP A			(628)						
TOC		+1		371	065	290/55	+39/-2	-	143	21	130		2800	76400	
LEO	330	+3	0.79	462	055	279/70	+51/-3	510	192	23	-	4218	1588	73600	73
PNR	330	+4	0.79	463	066	278/75	+64/-2	525	293	33	-	4115	2297	72012	71
LEO	130	+4	0.59	374	246	298/35	-23	351	293	50		4706	3928	69715	68
TOD	130	+2	0.59	373	235	299/45	-20/-2	351	294	50		4612	3863	65787	64
YPPH				230	245	300/45	-32 <sup>-2</sup>		41	13	50		520	61924	
APP													400	61404	
FF =													15396	61004	

FOB @ BRW = 16750 - 2250 FR – 100TS = 14400 Flight fuel available

FF = 15396 kg  
 Fuel Available = 14400 kg  
 Difference = -996 kg  
 Divided by SGR's (7.84 + 13.41)  
 = 47 nm too far  
 PNR = 628 nm – 47 nm  
 = 581 nm PERTH or 493 nm ALICE SPRINGS

**QUESTION AFPA\_040**

Refer B727 POH and RSWT Extract.

You are planning a maximum payload/minimum fuel flight from BRISBANE (YBBN) to SYDNEY (YSSY) via H62. You have the following flight planning data:

From the TAC: YBBN – HUUGO distance 45 nm. MEHAN – CORKY distance 36 nm. CORKY – SYDNEY distance 88 nm.

Cruise Level ..... Optimum IFR Flight Level

Mach Number ..... 0.80M

**RSWT EXTRACT**

FL	-ISA	YSSY/YBBN
445	-56	2808558
385	-56	2810554
340	-52	2910050
300	-45	2909544
235	-32	2907030
185	-21	2905517

Both BRISBANE and SYDNEY are SUITABLE for the duration of your operation.

Your calculation of the planned Brakes Release Weight at BRISBANE is closest to -

72640 kg

(5 marks)

Max payload/min fuel on a short flight will be ZFW limited, so LW will be MZFW plus reserves.

Estimated BRW= MZFW 63500 kg + (Distance 418 nm x 10 kg/nm + 1600 kg) + reserves  
= approximately 73t (this weight is only used for altitude capability and climb)

Estimated LW:

MZFW = 63500

+ 3300 kg FR

+ 578 kg 10% (estimate based on flight fuel of 418 nm x 10 kg/nm +1600 kg)

+ 100 kg taxi shutdown

= 67478 kg estimated landing weight - plan back from this to actual BRW

SEG	FL	DEV	M	TAS	TR	WV	WC	GS	DIST	ETI	AIRD	Fuel F	Zone F	SZW	MZW
YBBN									(418)					BRW	
TOC		+2		371	185	279/70	+5/-7	-	135	22	136		2750	72715	
TOD	350	+2	0.80	463	190	279/100	-3/-10	450	157	21		4033	1407	69965	69
YSSY				310	165	278/55	+21 <sup>-4</sup>	-	126	23	119		680	68558	
APP													400	67878	
Don't forget to revise the VR to update the BRW.												Flight Fuel	5237	67478	Est
Actual BRW would be 63500 MZFW + 3300 FR + 524 VR + 100 TS + 5237 FF = 72661															LW

**QUESTION AFPA\_041**

Refer B727 Performance and Operating Handbook, ERC H2, ERC H3, RSWT Extract and TAF.

A flight is being planned from DARWIN (YPDN) to ADELAIDE (YPAD) via routes A461 and J251.  
Flight planning details are:

Cruise level ..... Optimum FL  
TMN ..... 0.80  
ETD ..... 0100Z  
ETI ..... 206 minutes  
BRW ..... 81150 kg  
Estimated GW at the CP 1 INOP position..... 76100 kg

ALICE SPRINGS is available as an ALTN for ADELAIDE  
TAF YPAD.....SUITABLE  
TAF YBAS.....SUITABLE  
TAF YPDN.....SUITABLE

**RSWT EXTRACT**

FLIGHT LEVEL	-ISA	AD/WR	WR/AS	AS/BOYDI	BOYDI/DN
445	-56	2905557	2807061	2806065	2902566
385	-56	2905052	2808050	2806552	2702052
340	-52	2904549	2707544	2707040	2702540
300	-45	3003543	2706038	2706032	2802031
235	-32	3102530	2804526	2706019	2702517
185	-21	3202517	2903016	2703511	2701507

Your calculation of the distance from DARWIN, to the CP/1-INOP for DARWIN and ALICE SPRINGS, is closest to -

345 nm

(3 marks)

SEG	FL	DEV	M	TAS	TR	WV	WC	GS	DIST	ETI	AIRD	Fuel F	Zone F	SZW	MZW
Gson	210	+13	.662	415	161	265/60	+14/-4	425	CP/1 INOP = $\frac{701 \text{ nm} \times 408}{425 + 408} = 343 \text{ nm DN}$						
GShome	200	+14	.652	411	342	264/15	-2	408							
	EMZW for LRC Mach = $76100 - (701/4 \times 11) = 74T$														

At a GW of 76100 kg at the CP the Max 1 INOP FL is FL 210. Use the FL235 Wx until below FL210.  
At FL 200 use the FL185 Wx

Using an EMZW for the LRC Mach to determine the TAS makes 1 nm difference compared to using 420 kts block TAS for 1 INOP cruise.

**QUESTION AFPA\_042**

Refer B727 Performance and Operating Handbook and RSWT Extract.

You are planning a flight from CAIRNS (YBCS) to BRISBANE (YBBN) via Y177.

You have the following information:

Position ..... RUROX (THANGOOL)

GW..... 69750 kg

FL..... 330

TMN ..... 0.79

RSWT Extract

FL	-ISA	RUROX/BN
445	-56	2904554
385	-56	2905051
340	-52	3005549
300	-45	3005045
235	-32	3103531
185	-21	3303020

At RUROX ATC advise of delays in BRISBANE and instruct you to hold at EAGLE for 40 minutes at FL 280. After holding for 40 minutes then making a straight in approach for RWY 19, your planned Landing Weight is closest to -

65940 kg

(3 marks)

SEG	FL	DEV	M	TAS	TR	WV	WC	GS	DIST	ETI	AIRD	Fuel F	Zone F	SZW	MZW
RUROX									(220)						
TOD	330	+3	0.79	462	137	290/55	+48	510	73	9	-	4019	575	69750	69
EAGLE	\	-	-	480	137	290/50	+44	-	17	2	16	-	35	69175	-
HLD	280	-	-	-	-	-	-	-	-	40	-	3567	2378	69140	68
TOD	280	-	0.79	469	128	290/50	+47	516	22	3	-	4386	187	66762	67
BN	\	-	-	280	127	319/30	+29	-	108	21	98	-	635	66575	-
													LW	65940	

**QUESTION AFPA\_043**

Refer B727 POH.

During the cruise you suffer an engine failure. You have the following inflight data:

Cruise level ..... FL310  
 Gross weight ..... 78000 kg  
 Mach number ..... 0.79M  
 TAT ..... - 8 degrees C  
 Temperature ..... same ISA deviation at all levels

Ignoring driftdown allowance, your determination of the maximum westerly IFR level you may now maintain is –  
 FL220

(2 marks)

Refer B727 POH 1-INOP altitude capability at 78000 kg at ISA+10 (as per TAT) and IFR hemispherical levels.

**QUESTION AFPA\_044**

Refer B727 POH. After take-off from ADELAIDE you discover the undercarriage has failed to retract. You elect to climb to A100 in a designated dump area nearby to dump fuel from tanks 1, 2 and 3.

You have the following data:

BRW ..... 83000 kg  
 Temperature ..... ISA at all levels  
 Landing weight ..... MLW

Ignoring the fuel burnt during dumping operations, the minimum time interval before you may return to ADELAIDE for a landing is closest to -

27 minutes

(2 marks)

BRW	83000 kg	Time Allowance
MLW	- <u>72600</u> kg	
Fuel to Lose	= 10400 kg	
Climb	- 1100 kg	7 min (incl 20% time penalty for gear down)
Descent (incl 450 for gear down)	- 940 kg	+ 12 min
Approach	- <u>400</u> kg	
Fuel to lose at A100	= <u>7960</u> kg	
Dump rate (ignore burn)	1050 kg/min	+ <u>7.6</u> min
		= 26.6 min



**QUESTION AFPA\_045**

Refer B727 POH and ERC H1.

You are on track from BRISBANE to MELBOURNE via Q94. At 2315Z you are overhead PARKES and have the following inflight data:

Cruise level ..... FL310  
 Mach number ..... 0.79M  
 Temperature ..... TAT of -28  
 Wind from IRS ..... 220M/50  
 Gross weight ..... 78400 kg

At this time ATC advise that you will be required to hold at 95 track miles from MELBOURNE. To minimise holding time, you decide to cruise from PARKES to the holding position MELBOURNE using the long range cruise speed schedule (LRC).

Your calculation of the average ground speed between PARKES and the holding point is -

404 kt

(2 marks)

SEG	FL	DEV	M	TAS	TR	WV	WC	GS	DIST	ETI	AIRD	Fuel F	Zone F	SZW	MZW
PKS									(335)						
95ML	310	-10	0.789	453	206	22050	-49	404	240					78400	77

**QUESTION AFPA\_046**

You are flying at FL310 and 0.73M. The temperature is ISA+10.

Your indicated airspeed is closest to -

270 kt

(1 mark)

Refer CR3. The Mach/IAS relationship is dependent only on flight level.

**QUESTION AFPA\_047**

Refer B727 Performance and Operating Handbook, ERC H1 and RSWT Extract.

You are on track from BRISBANE (YBBN) to MELBOURNE (YMML) via Q94.

At 0300Z your position is 103 DME South of PARKES on Q94.

You have the following inflight data:

Cruise level ..... FL310

TMN ..... 0.82

Temperature

(to be used for ISA deviation for all cruise)..... TAT of -22

Wind from IRS for all cruise..... 238M/75

Gross weight ..... 72350 kg

TAC distance ..... CANTY to MELBOURNE is 52 nm

At 0307Z ATC advise that you will be required to hold at POLSO at FL 270 for 25 minutes. You make a normal descent to arrive at POLSO at FL270 and then hold at that level for 25 minutes.

**RSWT EXTRACT**  
**(for Holding and Descent Conditions)**

FL	-ISA	BN/PKS	PKS/ML
445	-56	2805053	2605564
385	-56	2806051	2506561
340	-52	2806049	2406059
300	-45	2805547	2305555
235	-32	2904536	2304042
185	-21	2804023	2403030

After holding for 25 minutes then descending for a straight in approach on RWY 16, the planned landing weight at MELBOURNE is closest to -

68673 kg

(4 marks)

SEG	FL	DEV	M	TAS	TR	WV	WC	GS	DIST	ETI	AIRD	Fuel F	Zone F	SZW	MZW
103 PKS									(232)						
TOD	310	-6	0.82	474	206	238/75	-64/-2	408	89	13	-	4428	966	72350	72
POLSO	\	-	-	480	206	238/75	-64/-2	-	11	1	12	-	30	71384	-
HLD	270	-6	-	-	-	-	-	-	-	25	-	3693	1539	71354	71
TOD	270	-6	0.82	482	208	238/75	-64/-2	416	44	6	-	4836	512	69830	70
ML	\	-	-	285	184	23030	-21	-	88	20	95	-	630	69318	-
													LW	68673	

**QUESTION AFPA\_048**

Refer B727 Performance and Operating Handbook.

You are planning a flight from BRISBANE to MELBOURNE with a BRW Limit of 82800 kg at BRISBANE.

MLW limit in MELBOURNE is 68200 kg.

You have calculated the flight fuel for normal and abnormal operations to be as follows:

Minimum Flight Fuel for Normal Operations ..... 10200 kg  
 Minimum Flight Fuel for Depressurised Operations from the CP..... 13100 kg  
 Minimum Flight Fuel for 1 Inoperative Operations from the CP..... 12600 kg

Your aircraft Basic Weight is the Fleet Average of 47120 kg.

The forecast conditions at BRISBANE indicate that it will be SUITABLE for the period of expected use, while MELBOURNE is forecast to be ACCEPTABLE, but may be considered suitable if 30 minutes weather holding is carried to cover forecast INTER periods.

The maximum payload you could uplift at BRISBANE for the flight to MELBOURNE is -

13820 kg

(3 marks)

	<b>Normal Ops</b>	<b>Depressurised Ops</b>	<b>1 Engine Inoperative</b>
Flight Fuel	10200 kg	13100 kg	12600 kg
10% VR	1020 kg	nil	1260 kg
Taxi	100 kg	100 kg	100 kg
FR	3300 kg	2250 kg	1500 kg
Holding	<u>2000 kg</u>	<u>nil</u>	<u>2000 kg</u>
Min Fuel	16620 kg	15450 kg	<b>17460 kg</b>

1-INOP Fuel is most limiting at 17460 kg minimum required.

BRW will be least of ...

MBRW limit (structural or performance)	82800 kg
MLW (structural or Performance + Flight fuel normal ops)	
68200 + 10200	78400 kg
MZFW + Total FOB	
63500 + 17460	80960 kg

BRW	<u>78400 kg</u>
-FOB	17460 kg
ZFW	60940 kg
-BW	<u>47120 kg</u>
P/Load	13820 kg

**QUESTION AFPA\_049**

Refer B727 POH, ERC H2, ERC H3 and RSWT Extract.

You are planning a flight from PERTH to DARWIN via Y36, T63 and KUNUNURRA.

Flight planning details are:

From the TAC: PERTH – KONIL distance 173 nm. JULUP – DARWIN distance 79 nm.

BRW ..... 82000 kg

Cruise level ..... maximum appropriate IFR flight level

Mach number ..... 0.82M

**RSWT EXTRACT**

FL	-ISA	PH/MEK	MEK/PD	PD/CIN	CIN/KUN	KUN/DN
445	-56	2705560	2806064	2804567	2702067	2701067
385	-56	2605553	2807553	2905553	2702553	2701552
340	-52	2604546	2807043	2905042	2702541	2801541
300	-45	2303539	2806035	2905031	2811530	3110530
235	-32	2602025	2805021	2903517	3411016	0411016
185	-21	3002014	2902511	2802508	2803006	2803006

Your calculation of the location of the CP/DP for PERTH and DARWIN, as a distance from DARWIN, is closest to -

741 nm

(3 marks)

SEG	FL	DEV	M	TAS	TR	WV	WC	GS	DIST	ETI	AIRD	Fuel F	Zone F	SZW	MZW
GS ON	130	+15	0.59	383	030	278/28	+10	393							
GS HOME	130	+8	0.59	378	220	297/22	-6	372							

$$\text{CP/DP} = \frac{\text{Distance} \times \text{GS HOME}}{\text{GS ON} + \text{GS HOME}}$$

$$\frac{1443 \text{ nm} \times 372 \text{ kt}}{393 \text{ kt} + 372 \text{ kt}}$$

$$= 702 \text{ nm PERTH or } 741 \text{ nm DARWIN}$$

**QUESTION AFPA\_050**

Refer B727 POH, ERC H1 and RSWT extract.

You are planning a flight from BRISBANE (YBBN) to MELBOURNE.

Flight planning details are:

Brakes Release Weight ..... 69650 kg

The forecasts indicate BRISBANE to be ACCEPTABLE with the requirement for an ALTN. MELBOURNE is SUITABLE with 15 minutes ATC holding required.

SYDNEY (YSSY) is ACCEPTABLE but may be considered SUITABLE if 60 minutes holding is carried to cover forecast TEMPO periods.

From the TAC: YBBN – HUUGO distance 45 nm. MEHAN – CORKY distance 36 nm. CORKY – SYDNEY distance 88 nm.

**RSWT EXTRACT**

FL	-ISA	YBBN/YSSY
445	-56	2810554
385	-56	2813050
340	-52	2812545
300	-45	2810543
235	-32	2707030
185	-21	2604520

Your calculation of the minimum fuel required on board, in the event of an engine failure at V1 on take-off from BRISBANE, to enable you to proceed to SYDNEY at FL220 via H62, and land with required reserves intact is closest to -

12512 kg

(5 marks)

SEG	FL	DEV	M	TAS	TR	WV	WC	GS	DIST	ETI	AIRD	Fuel F	Zone F	SZW	MZW
BN									(418)						
TOC	cl	+1	-	278	185	249/45	-20/-3	-	102	24	111	-	2575	69650	
TOD	220	+2	0.646	394	190	259/70	-25/-6	363	241	40	-	4080	2708	67075	66
SY	des	-	-	257	160	249/45	-1/-4	-	75	18	77		600	64367	
APP													400	63767	-
												FF	6283	63367	

+ 10% 629  
 + FR 1500  
 + Hold 4000  
 + TS 100  
 = Total 12512

**QUESTION AFPA\_051**

Refer B727 Performance and Operating Handbook and ERC H3.

You at NATYA, enroute from ADELAIDE (YPAD) to SYDNEY (YSSY) via route H247. At NATYA, ATC advise that you will be required to hold at FL270 overhead CULIN for traffic sequencing.

You have the following inflight data:

Gross weight ..... 74300 kg

Cruise level ..... FL330

TMN ..... 0.80

SAT ..... -38 degrees C

Wind from INS ..... 300M/50 Use this for all planning

You conduct a normal descent from FL330 to FL270. After holding at CULIN for 42 minutes then descending for a straight in approach on RWY 16 SY, your planned LW is closest to –

68529 kg

(4 marks)

SEG	FL	DEV	M	TAS	TR	WV	WC	GS	DIST	ETI	AIRD	Fuel F	Zone F	SZW	MZW
NATYA									(405)						
TOD	330	+12	0.80	478	076	300/50	+35	513	284	33	-	4429	2452	74300	73
CULIN	\	-	-	540	073	300/50	+33	-	20	2	19	-	40	71848	-
HOLD	270	+12	-	-	-	300/50	-	-	-	42	-	3752	2626	71808	70
TOD	270	+12	.80	488	050	300/50	+18/-3	503	2	.2		4853	23	69182	69
SY	\	-	-	273	049	300/50	+17/-4		99	20	95	-	630	69159	
														68529	

**QUESTION AFPA\_052**

Refer B727 Performance and Operating Handbook, ERC H2 and H3.

You are pilot in command of a B727 aircraft proceeding from BRISBANE to ALICE SPRINGS via route T11 then to CURTIN direct. You are over NONET with a Total FOB of 12225 kg.

You decide to calculate the position of the PNR/1-INOP based on a return to ALICE SPRINGS from along the ALICE SPRINGS to CURTIN segment.

ALICE SPRINGS weather is forecast to be ACCEPTABLE, but SUITABLE with 30 min holding. ALICE SPRINGS also has a 20 min TRAFFIC holding requirement.

You have the following planning data:

NONET to PNR/1-INOP at normal cruise:

Fuel Flow ..... 4300 kg/hr  
 TAS ..... 460 kt  
 Wind Component ..... +50 kt

PNR/1-INOP to ALICE SPRINGS at 1-INOP cruise:

Fuel Flow ..... 4400 kg/hr  
 TAS ..... 420 kt  
 Wind Component ..... -30 kt

Disregarding adjustments for descent, your calculation of the distance to the PNR/1-INOP to ALICE SPRINGS as a distance from NONET is closest to -

638 nm

(2 marks)

Total FOB	12225 kg
- FR 1 INOP	1500 kg
- holding 30 min	2000 kg
- holding TFC	NIL (not required for Abnormal Operations)
- TS	<u>NIL (in flight)</u>
- VR	8725/1.1
= flight fuel available	7932 kg

SGR OUT =  $\frac{\text{Fuel Flow 4300 kg/hr}}{\text{GS 510 kt}}$  = 8.43 kg/nm

SGR HOME =  $\frac{\text{Fuel Flow 4400 kg/hr}}{\text{GS 390 kt}}$  = 11.28 kg/nm

PNR =  $\frac{\text{Flight Fuel over NONET} - \text{FBO NONET to ALICE SPRINGS normal ops}}{\text{SGR out} + \text{SGR home}}$

PNR =  $\frac{\text{Flight Fuel 7932 kg} - (\text{Distance NONET to AS 408 nm} \times 8.43 \text{ kg/nm})}{\text{SGR OUT 8.43} + \text{SGR HOME 11.28}}$

PNR =  $\frac{7932 \text{ kg} - 3439 \text{ kg}}{19.71}$

= 228 nm from ALICE SPRINGS + 408 nm (ALICE SPRINGS – NONET)

= 636 nm NONET

## QUESTION AFPA\_053

Refer B727 POH.

Due to an inflight problem, the Pilot in Command decides to use engines 2 and 3 for airconditioning bleed air.

Inflight conditions are:

GW ..... 76000 kg  
Cruise level ..... FL310  
TAT ..... -19 degrees C  
Mach number ..... 0.79M

Your determination of the maximum cruise EPR settings for Engines 1, 2 and 3 respectively are -

2.19                  2.11                  2.13

(2 marks)

Refer B727 POH page 3-84. FL310 cruise at 0.79M.

Max cruise EPR for normal configuration with engines 1 and 3 supplying bleed air.

	<b>Eng 1</b>		<b>Eng 2</b>		<b>Eng 3</b>
	2.13		2.17		2.13
close eng1 bld	<u>+.06</u>	open eng 2 bld	<u>-.06</u>	no change eng 3	-
	2.19		2.11		2.13



**QUESTION AFPA\_054**

Refer B727 POH, ERC H3 and RSWT Extract.

You are planning a maximum payload/minimum fuel flight from MELBOURNE (YMML) to ADELAIDE (YPAD) via H345.

Planning details are:

Cruise level ..... Optimum IFR Level

Mach number ..... 0.82M

**RSWT EXTRACT**

FL	-ISA	YMML/YPAD
445	-56	2604561
385	-56	2403555
340	-52	2202549
300	-45	2202541
235	-32	2102026
185	-21	2202013

MELBOURNE is forecast to be SUITABLE for the duration of your planned operation and ADELAIDE is forecast to be ACCEPTABLE for your arrival, but may be considered SUITABLE if 60 minutes weather holding fuel is carried.

Your calculation of the planned Brakes Release Weight at MELBOURNE is closest to -

76359 kg

(5 marks)

Maximum payload/minimum fuel on a short flight means BRW is limited by the MZFW.  
 349 nm distance x 10 kg/nm + 1600 kg = 5090 kg approximate flight fuel.

Approximate BRW will be MZFW + Total estimated fuel

Flight Fuel	5090 kg
EST 10%	+ 509 kg
FR	+ 3300 kg
TS	+ 100 kg
60 HOLD	+ 4000 kg
Total	= 12999 kg
	+ 63500 kg (MZFW)
EST BRW	= 76499 kg (used for FL)
	- 5090 kg
EST LW	71409 kg plan back from LW

Landing Weight will be MZFW + reserves

SEG	FL	DEV	M	TAS	TR	WV	WC	GS	DIST	ETI	AIRD	Fuel F	Zone F	SZW	MZW
ML									(349)					BRW	
TOC	clb	+9	-	381	278	209/20	-8	-	143	23	146	-	2950	76372	
BOR	310	+4	0.82	485	280	210/25	-9	476	68	9	-	4609	658	73422	73
TOD	310	+4	0.82	485	300	211/25	-	484	31	4	-	4609	295	72764	73
AD	des	-	-	306	300	212/20	-1	-	107	21	107		660	72469	
APP													400	71809	
	Don't forget to revise the VR to determine BRW										Flight Fuel		4963	71409	start
Actual BRW will be MZFW 63500 + 4962 FF + 497 VR+ 3300 FR + 100 TS + 4000 hold = 76359 kg															

**QUESTION AFPA\_055**

Refer B727 POH, ERC H3 and RSWT Extract.

You are to ferry a B727 with the landing gear extended from ALICE SPRINGS (YBAS) to ADELAIDE (YPAD).

You will plan via J251 and H84.

You have the following flight planning data:

BRW at ALICE SPRINGS is 75000 kg.

**RSWT EXTRACT**

FL	-ISA	YBAS/YPAD
445	-56	2908062
385	-56	2707550
340	-52	2706044
300	-45	2705034
235	-32	2603519
185	-21	2602009

ALICE SPRINGS and ADELAIDE are forecast to be SUITABLE for the flight.

TAC data:

MARGO to ADELAIDE

Track ..... 135M

Distance ..... 40 nm

Your calculation of the minimum flight fuel required on board at engine start up is closest to -

17730 kg

(5 marks)

SEG	FL	DEV	M	TAS	TR	WV	WC	GS	DIST	ETI	AIRD	Fuel F	Zone F	SZW	MZW
AS									(712)					BRW	
TOC	clb	+12	-	180	155	255/20	+3/-1	-	24	8	24	-	1075	75000	
TOD	110	+12	0.442	287	155	253/20	+2	289	651	135	-	6795	15306	73925	66
AD	des	-	-	175	135	252/20	+9/-1	-	37	12	35		950	58619	
APP													400	57669	
												FF	17731	57269	

**QUESTION AFPA\_056**

Refer B727 POH, ERC H2, ERC H3, RSWT Extract.

You are enroute from PERTH to DARWIN via Y36, T63 and KUNUNURRA.

You obtain a positive fix overhead BIDAP (604 nm from PERTH) at 0117Z and have the following inflight data at BIDAP:

Cruise level ..... FL330  
 Mach number ..... 0.80M  
 Gross weight ..... 76500 kg  
 Fuel on board ..... 13400 kg  
 Wind from IRS ..... 260T/100  
 TAT ..... -12 degrees C

**RSWT EXTRACT**

FL	-ISA	PH/MEK	MEK/PD	PD/CIN	CIN/KUN	KUN/DN
445	-56	2705560	2806064	2804567	2702067	2701067
385	-56	2605553	2807553	2905553	2702553	2701552
340	-52	2604546	2807043	2905042	2702541	2801541
300	-45	2303539	2806035	2905031	2811530	3110530
235	-32	2602025	2805021	2903517	3411016	0411016
185	-21	3502014	2902511	2802508	0505006	0810006

Using the IRS wind for your outbound cruise calculation, the distance to the PNR/DP for return to PERTH, measured from DARWIN, is closest to -

688 nm

(4 marks)

SEG	FL	DEV	M	TAS	TR	WV	WC	GS	DIST	ETI	AIRD	Fuel F	Zone F	SZW	MZW
BIDAP								Try POTIP (797) PH							
POTIP	330	+10	0.80	475	030	257/100	+69/-6	538	193	22	-	4560	1634	76500	76
LST	130	+10	0.59	378	210	288/25	-5	372	440	71		4901	5797	74866	72
TOD	130	+7	0.59	376	215	350/20	+14	390	305	47		4728	3698	69069	67
PH	des	-	-	230	225	351/20	+11	-	52	13	50	-	520	65371	-
APP													400	64851	-
FF													12049	64451	

Total FOB 13400  
 - FR 2250  
 Flight Fuel Avail 11150 kg  
 FF planned - 12049 kg  
 = 899 kg deficit  
 Divided by SGRs 8.48 + 13.17 = 42 nm shorter

= 797 nm - 42 nm = 755 nm PERTH or 688 nm DARWIN

**QUESTION AFPA\_057**

Refer B727 POH.

ATC has cleared you to a block altitude from FL310 to FL330. You elect to conduct an optimum cruise climb from FL310 to FL330.

Climb details are:

Climb Mach number ..... 0.82M  
 Gross weight at FL310 ..... 80500 kg  
 TAT at FL310 ..... -16 degrees C  
 Wind component for climb ..... +40 kt

The distance covered over the ground during the cruise climb from FL310 to FL330 is closest to -

789 nm

(2 marks)

An optimum cruise climb involves climbing as weight reduces to remain at the optimum weight for each flight level. The difference in optimum weights (from page 2-14 of the B727 POH) between the start of the climb and top of climb represents the fuel consumed in the climb. This may be converted into equivalent distance at the average rate of consumption at cruise power and average groundspeed. These average figures are taken at the mid zone weight at the mid-altitude:

Optimum weight for FL310 at 0.82M = 80500 kg  
 Optimum weight for FL330 at 0.82M = 73300 kg  
 Weight difference (zone fuel) = 7200 kg

Mid zone weight = 77t

Average fuel flow at FL320 @ 77t = 4731 kg/hr (ISA)  
 Average GS at 0.82M at FL320 = 519 kt

Average SGR (kg/nm) = 9.12 kg/nm

Zone Fuel = 7200 kg  
 SGR = 9.12 kg/nm

Distance covered = 789 nm distance covered during the climb

**QUESTION AFPA\_058**

Refer B727 Performance and Operating Handbook.

Due to an inflight problem, the Pilot in Command decides to use engines 1 and 2 for airconditioning bleed air.

Inflight conditions are:

GW ..... 72000 kg  
 Cruise level ..... FL350  
 TAT ..... -25 degrees C  
 TMN ..... 0.79  
 Anti Ice ..... ON WING AND ENGINE

Your determination of the maximum cruise EPR settings for Engines 1, 2 and 3 respectively are -  
 1.98, 2.02, 2.05

(2 marks)

Refer B727 POH page 3-87. FL350 cruise at 0.79M.

Max cruise EPR for normal configuration with engines 1 and 2 supplying bleed air.

	<b>Eng 1</b>		<b>Eng 2</b>		<b>Eng 3</b>
	2.14		2.19		2.14
no change eng 1		open eng 2 bld	<u>- .065</u>	close eng3 bld	<u>+.07</u>
	2.14		2.125		2.21
Anti Ice	<u>- .16</u>		<u>-.11</u>		<u>-.16</u>
	1.98		2.02		2.05

**QUESTION AFPA\_059**

Refer B727 POH.

Given the following information:

Gross weight ..... 70000 kg  
 Turbulence ..... severe  
 Cruise level ..... FL310  
 Mach number ..... 0.80M

The margins in knots, above and below the low and high speed buffet boundaries, respectively are -  
 27 kt above the low speed buffet boundary and 10 kt below the high speed buffet boundary

(1 mark)

Refer B727 POH page 2-13 severe turbulence buffet boundaries.

**QUESTION AFPA\_060**

Refer B727 POH.

You are commencing a climb from FL150 to FL350 and have the following inflight details:

Temperature ..... ISA+10  
 Gross weight ..... 72500 kg

The average rate of climb and top of climb gross weight respectively are -

1000 ft/minute rate of climb and top of climb gross weight 70500 kg

(2 marks)

Refer to the B727 POH page 2-9. At FL150 with a gross weight of 72500 kg find the approximate BRW (to the nearest 2000 kg) for graph entry by adding the approximate climb fuel used from sea level to FL150. At ISA+10, this is about 1300 kg, so the BRW would have been closest to 74T.

Using an approximate BRW of 74T, find the climb figures for Sea Level to FL350, then subtract the figures for Sea Level to FL150 to find the figures from FL150 to FL350.

BRW 74t ISA+10	Fuel	ETI
Climb MSL to FL350	3325 kg	28.5 min
Climb MSL to FL150	- 1325 kg	- 8.5 min
Climb FL150 to FL350	= 2000 kg	20.0 min

Top of climb gross weight = 72500 kg GW at FL150  
 - 2000 kg climb fuel FL150 to FL350  
 = 70500 kg

Rate of climb = 20000 ft in 20 min = 1000 ft/min

**QUESTION AFPA\_061**

Refer B727 POH, ERC H1 and RSWT Extract.

A B727 is enroute CAIRNS (YBCS) to BRISBANE (YBBN) via Y177. Current position is RUROX

TMN.....0.80M

FL.....330

GW.....68450 kg

TAT.....-22

IRS Wind.....264(M)/73 kt - Use for all calculations

An Air Conditioning Pack failure at RUROX requires a descent to and cruise at FL250.

The Distance from RUROX and GW at which the aircraft will reach FL250 is closest to -

28 nm, 68400 kg

(2 marks)

SEG	FL	DEV	M	TAS	TR	WV	WC	GS	DIST	ETI	AIRD	Fuel F	Zone F	SZW	MZW
330															
250	\	-	-	520	137	264/73	+44/-4	-	28	3	26	-	50	68450	
														68400	

**QUESTION AFPA\_062**

A B727 is maintaining FL310 at 0.80M in ISA+10 conditions. A Cruise Climb is made to non-standard FL330.

Gross weight at the commencement of the Cruise Climb is 81600 kg.

Wind component during the climb is +40 kt.

If the optimum weight is to be maintained during the climb, the distance covered during the cruise climb to FL330 is -

813 nm

(2 marks)

Refer to page 2-14 Altitude Capability

Current Gross Weight		81600 kg (optimum for FL310)
Optimum for FL330	-	74200 kg
Climb Fuel	=	7400 kg
Average Fuel Flow (FL320 at 78t EMZW ISA+10)	=	4697 kg/hr
Average Groundspeed (TAS at M.8 at FL320 +40 kt)	=	516 kt
Average fuel consumption (fuel flow/GS)	=	9.1 kg/nm
Climb distance	=	7400 kg fuel burn
		9.1 SGR
	=	813 nm

**QUESTION AFPA\_063**

You are planning a flight from AUCKLAND (NZAA) to SYDNEY (YSSY).

You have the following planning data:

Maximum performance limited BRW AUCKLAND..... 85550 kg  
 Maximum performance limited LW SYDNEY..... 71450 kg  
 Basic Weight ..... 47250 kg

SYDNEY is SUITABLE. AUCKLAND is ACCEPTABLE, but may be considered SUITABLE if 60 minutes holding fuel is carried.

Flight fuel for Normal Operations is 13950 kg.

Flight fuel for Normal Operations to the NZAA-YSSY CP/1-INOP then One Engine Inoperative Operations (1-INOP) from the CP is 14900 kg.

Flight fuel for Normal Operations to the NZAA- YSSY CP (Depressurised) then Depressurised from the CP is 15750 kg.

The maximum payload for the flight is closest to -

16160 kg

(3 marks)

The minimum FOB at BRW must be the greatest of the company policy requirements as follows:

	<b>Normal Ops</b>	<b>1-INOP</b>	<b>DP</b>
FF	13950	14900	15750
VR	1395	1490	nil
FR	3300	1500	2250
TS	100	100	100
HOLD	nil	4000	nil
FOB	18745	21990*	18100

The BRW will be governed by one of the three limits:

MBRW (Structural or Performance Limited) 85550 kg  
 Structural or Performance Limited MLW 71450 kg (30 flap)  
 Structural MZFW 63500 kg

The least of three method looks at each of these three limits using the planned fuel figures:

1. MBRW 85550 kg This is the takeoff limited BRW.
2. MLW + Flight Fuel  
 $71450 + 13950 \text{ kg} = 85400 \text{ kg}$  This is the BRW allowed without exceeding the LW limit.
3. MZFW + FOB  
 $63500 + 21990 \text{ kg} = 85490 \text{ kg}$  This is the BRW allowed without exceeding the ZFW limit.

As the LW limit is the lowest BRW, Maximum Payload is achieved at BRW 85400 kg.

1-INOP fuel is most limiting so the zero fuel weight is BRW 85400 - 21990 kg (1-INOP fuel).

BRW	85400 kg	ZFW	63410 kg
- FOB	<u>21990 kg</u>	- BW	<u>47250 kg</u>
= ZFW	63410 kg	= PL	16160 kg



## QUESTION AFPA\_064

Refer B727 POH.

You are conducting a flight from BRISBANE (YBBN) to MELBOURNE (YMML) via Q94. You have the following data:

BRW Brisbane ..... 83900 kg

RSWT temperature ..... ISA+5 at all levels

During the takeoff roll the tail skid is damaged and fails to retract after takeoff. You elect to continue the flight IFR and plan to cruise at 0.79M.

Your determination of the highest initial hemispherical flight level which can be attained is -

FL280

(1 mark)

Refer to the Altitude Capability table on page 2-14 of the B727 POH and the tail skid corrections on page 5-3. An extended tail skid requires reduction of thrust limited cruise weights by 9000 kg.

Pick an altitude and check the thrust limit.

At ISA+5 the normal M.79 thrust limit at FL310 is 87800 kg. With the 9000 kg thrust limit reduction for the tail skid the new thrust limit is 78800 kg.

The BRW of 83900 kg is 5100 kg heavier than the thrust limit so the climb would need to consume at least 5100 kg in order to be capable of reaching FL310.

The climb tables show that a climb to FL310 would only consume 3375 kg so the GW at TOC would be too heavy for FL310. FL290 is attainable but is not hemispherical for a Westerly track. FL280 is therefore the highest hemispherical level attainable.

**QUESTION AFPA\_065**

Refer B727 POH.

You are enroute from PERTH to DARWIN via J124, T63 and J72. Your current position is overhead KUNUNURRA (KU) cruising at the maximum available flight level. You have the following inflight data:

Mach number ..... 0.82M  
 Temperature ..... ISA+10  
 Gross weight ..... 73600 kg  
 RSWT forecast for FL185 ..... 3401512

Your calculation of the distance from DARWIN to your planned Top Of Descent is closest to -

110 nm

(2 marks)

SEG	FL	DEV	M	TAS	TR	WV	WC	GS	DIST	ETI	AIRD	Fuel F	Zone F	SZW	MZW
KU									237						
TOD	330	+10	0.82		029				126					73600	
DN	\	-	-	311	029	337/15	-9	-	111	22	114				
APP															

**QUESTION AFPA\_066**

Refer B727 Performance and Operating Handbook, ERC H2 and RSWT Extract.

You are on a flight from BRISBANE to BALI via G326. Your position is VINAX.

You have the following inflight data:

Cruise level ..... FL280  
 TMN ..... 0.82  
 Gross weight ..... 80400 kg

**RSWT EXTRACT**

<b>FL</b>	<b>-ISA</b>	<b>VINAX/GUNAM</b>
445	-56	2908062
385	-56	2707550
340	-52	2706044
300	-45	2704039
235	-32	2603519
185	-21	2602009

Your calculation of the planned FBO from VINAX to GUNAM, with a step climb at BOYDI to FL310 is closest to -

9113 kg

(3 marks)

<b>SEG</b>	<b>FL</b>	<b>DEV</b>	<b>M</b>	<b>TAS</b>	<b>TR</b>	<b>WV</b>	<b>WC</b>	<b>GS</b>	<b>DIST</b>	<b>ETI</b>	<b>AIRD</b>	<b>Fuel F</b>	<b>Zone F</b>	<b>SZW</b>	<b>MZW</b>
BOYDI	280	+6	0.82	493	293	265/40	-36	457	346	45	-	5150	3899	80400	78
GUNAM	310	+6	0.82	487	296	265/40	-35	452	487	65	-	4700	<sup>150</sup> 5064	76501	74
												zone	9113		

**QUESTION AFPA\_067**

Refer B727 Performance and Operating Handbook, ERC H1 and RSWT Extract.

You are conducting a flight from BRISBANE (YBBN) to MELBOURNE (YMML) via Q94. You obtain a positive fix on track 120 nm past PARKES. ATC advise that you will be required to hold for 38 minutes due traffic sequencing, at FL280 at a position 15 track miles past POLSO.

Inflight data at your present position is:

Cruise level ..... FL350  
 TMN ..... 0.82  
 Gross weight ..... 72450 kg  
 TAC distance ..... CANTY to MELBOURNE is 52 nm

**RSWT Extract**

<b>FLIGHT LEVEL</b>	<b>-ISA</b>	<b>PKS/YMML</b>
445	-56	2908062
385	-56	2903552
340	-52	3003054
300	-45	3002051
235	-32	3101539
185	-21	3101027

You continue the flight making a normal descent to arrive at the holding position at FL290. After holding for 38 minutes the flight makes a normal approach and landing.

Your calculation of the planned landing weight is closest to -

68133 kg

(4 marks)

<b>SEG</b>	<b>FL</b>	<b>DEV</b>	<b>M</b>	<b>TAS</b>	<b>TR</b>	<b>WV</b>	<b>WC</b>	<b>GS</b>	<b>DIST</b>	<b>ETI</b>	<b>AIRD</b>	<b>Fuel F</b>	<b>Zone F</b>	<b>SZW</b>	<b>MZW</b>
Fix									215						
TOD	350	-2	0.82	470	208	289/30	-6	464	77	10	-	4364	724	72450	72
15 POLSO	\	-	-	-	208	289/20	-4	-	21	2	21	-	45	71726	
HOLD	280	-6	hold	-	-	-	-	-	-	38	-	3690	2337	71681	71
TOD	280	-6	0.82	481	208	289/20	-4	477	18	2	-	4664	176	69344	69
ML	\	-	-	280	185	299/10	+4	-	99	21	98	-	635	69168	
APP													400	68533	
													4317	68133	LW

**QUESTION AFPA\_068**

Refer B727 POH, ERC H2 and RSWT Extract.

You are planning a flight BRISBANE (YBBN) to ALICE SPRINGS (YBAS) via G326 and T11. Flight planning details are:

Cruise level ..... FL310  
 Mach number ..... 0.82M  
 BRW ..... 83000 kg  
 Fuel on board at start up ..... 19950 kg

**RSWT EXTRACT**

FL	-ISA	YBBN/ROM	ROM/NONET	NONET/YBAS
445	-56	3104560	3205060	2905061
385	-56	3004549	3206049	3006050
340	-52	3004041	3205041	3004542
300	-45	2906034	2706034	2605030
235	-32	2805022	2505016	2403016
185	-21	2803011	2504008	2402008

BRISBANE is ACCEPTABLE, but may considered SUITABLE if 30 minutes holding fuel is carried.  
 ALICE SPRINGS is SUITABLE for the period of possible use. Original flight plan data:

Gross weight at ROM ..... 78500 kg  
 Gross weight at VILOL ..... 76000 kg  
 Gross weight at NONET ..... 73800 kg  
 Gross weight at PULOL ..... 71150 kg  
 Gross weight at YBAS ..... 69800 kg

Your calculation of the distance to the PNR/1-INOP from BRISBANE is closest to -

600 nm

(5 marks)

SEG	FL	DEV	M	TAS	TR	WV	WC	GS	DIST	ETI	AIRD	Fuel F	Zone F	SZW	MZW
Try NONET as PNR									658						
VILOL									458				7000	83000	
NONET									200	SGR out 11 kg/nm			2200	76000	
ROM	210	+16	0.656	413	092	241/50	+42	455	419	55	-	4647	4279	73800	72
TOD	210	+10	0.646	402	092	270/50	+40	452	154	20	-	4363	1487	69521	69
YBBN	-	-		268	091	270/30	+30		85	17	76		590	68034	.
APP					-								400		
			FOB at Start =			19950						FF	15956		
					ST	- 150		Flight Fuel avail @ BRW					14727	at NONET	
					FR	- 1500						=	1229 too far		
					Hld	- 2000							11 out + 10.2 home		
					TS	-100							= 58 nm too far		
					VR	÷ 1.1							PNR= 658 - 58		
				FF at BR		= 14727							= 600 nm BN		

**QUESTION AFPA\_069**

Refer B727 Performance and Operating Handbook, ERC H1 and RSWT Extract.

You are planning a flight from BRISBANE (YBBN) to MELBOURNE (YMML) via Q94.

You have the following planning data:

Cruise level ..... FL310 to PARKES then Step Climb to FL 350 at PARKES  
 TMN ..... 0.82  
 TOC ..... 112 nm from YBBN  
 TOC GW ..... 74350 kg  
 TOD ..... 110 nm before YMML

TAC data:

BRISBANE to LARAVALLE  
 Distance ..... 45 nm  
 Track ..... 183M

CANTY to MELBOURNE  
 Distance ..... 52 nm  
 Track ..... 159M

**RSWT EXTRACT**

FL	-ISA	BN/PKS	PKS/ML
445	-56	2805053	2605564
385	-56	2806051	2506561
340	-52	2806049	2406059
300	-45	2908543	3002051
235	-32	2904536	2304042
185	-21	2804023	2403030

Your calculation of the planned FBO from Top of Climb (TOC) to Top of Descent (TOD) is closest to -

5775 kg

(3 marks)

SEG	FL	DEV	M	TAS	TR	WV	WC	GS	DIST	ETI	AIRD	Fuel F	Zone F	SZW	MZW
									767						
PKS	310	+2	0.82	483	207	279/85	-26/-7	450	320	43	-	4609	3278	74350	73
TOD	350	-7	0.82	465	207	229/60	-56	409	225	33	-	4178	2298 <sup>+200</sup>	71080	70
Includes Step climb allowance 200 kg												FF	5776		

**QUESTION AFPA\_070**

Refer B727 Flight Manual Extract, ERC H3 and RSWT Extract.

You are planning a flight from DARWIN (YPDN) to MELBOURNE (YMML) via A461 and H119.

You have the following planning data:

Ramp weight ..... 83250 kg

Cruise level ..... FL330

TMN ..... 0.82

TAC data:

CANTY to MELBOURNE

Distance ..... 52 nm

Track ..... 159M

Enroute overhead ALICE SPRINGS (YBAS)

Gross weight ..... 74630 kg

Cruise level ..... FL330

TMN ..... 0.82

DARWIN is SUITABLE, MELBOURNE and ALICE SPRINGS are ACCEPTABLE, but may be considered SUITABLE if 30 minutes holding fuel is carried.

You calculate the ALICE SPRINGS to MELBOURNE CP/DP to be 6 nm south of LEIGH CREEK (YLEC).

**RSWT EXTRACT**

FL	-ISA	YPDN/YBAS	YBAS/LEC	LEC/YMML
445	-56	3104560	3205060	2905061
385	-56	3004549	3206049	3006050
340	-52	3004041	2102046	2704546
300	-45	2906034	2702034	2605030
235	-32	2805022	2003016	2403016
185	-21	2803011	2802013	2703011

Your calculation of the total fuel required to be on board at engine start, to cover depressurisation at the CP/DP, is closest to -

22250 kg

(4 marks)

SEG	FL	DEV	M	TAS	TR	WV	WC	GS	DIST	ETI	AIRD	Fuel F	Zone F	SZW	MZW
YBAS									1013				8470 DN - AS		
CP/DP	330	+6	0.82	483	142	204/20	-10	473	480	61	-	4498	4565	74630	72
TOD	130	+10	0.59	378	130	261/30	+19	397	482	73	-	4774	5796	70065	67
ML	-	-	-	230	159	259/30	+5/-2	-	51	13	50	-	520	64269	
APP					-								400	63749	
												FF	19751	63349	LW
												FR	2250		
												ST	150		
												TS	100		
												FOB	22251		

## QUESTION AFPA\_071

Refer B727 POH, ERC H3 and RSWT Extract.

You are planning a flight from ADELAIDE (YPAD) to PERTH (YPPH) via Q12 and Q158.

Flight planning details are:

Cruise level ..... FL310  
 Mach number ..... 0.80M  
 BRW ..... 84450 kg  
 Fuel on Board at BRW ..... 23300 kg

Original flight plan data:

Gross weight at TUNAA ..... 80100 kg  
 Gross weight at LUCRE ..... 75150 kg

PERTH is ACCEPTABLE but may be considered SUITABLE if 30 minutes holding is carried. ADELAIDE is SUITABLE.

### RSWT EXTRACT

FL	-ISA	YPPH/LUCRE	LUCRE/TUNAA	TUNAA/YPAD
445	-56	3104560	3205060	2905061
385	-56	3004549	3206049	3006050
340	-52	3004041	2102046	2704546
300	-45	2306034	2702034	2605030
235	-32	2005024	2003016	2403016
185	-21	1803011	2003012	2002013

Your calculation of the location of the PNR/DP to ADELAIDE via Q12, measured as a distance from PERTH is closest to -

352 nm

(5 marks)



**QUESTION AFPA\_071** (continued)

SEG	FL	DEV	M	TAS	TR	WV	WC	GS	DIST	ETI	AIRD	Fuel F	Zone F	SZW	MZW
LUCRE													9300		
ESP	310	+11	0.80	480	279	229/60	-39/-2	439	162	22	-	4574	1688	75150	74
LUCRE	130	+11	0.59	379	101	179/30	-7	372	162	26	-	4948	2155	73462	72
TUNAA	130	+10	0.59	378	095	196/30	+5	383	433	68	-	4823	5453	71307	69
TOD	130	+9	0.59	377	080	193/20	+7	384	188	29	-	4726	2314	65854	65
YPAD	-	-	-	230	080	193/20	+7	-	52	13	50		520		
APP													400		
					FOB	23300						FF	21830	too far	
					- FR	2250						Avail	20950		
					- TS	100						Over	880		
					= FF	20950							10.42 + 13.3		
												Adjust	- 37 nm		
												PNR = 835 - 37 = 798 nm AD			
												798 nm AD = 352 nm PH			

**QUESTION AFPA\_072**

Refer B727 POH, ERC H3 and RSWT Extract.

You are planning a ferry flight with the landing gear locked down from ALICE SPRINGS (YBAS) to ADELAIDE (YPAD) via J251.

Flight planning details are:

Cruise level ..... FL170

BRW ..... 68500 kg

TAC data:

WHYALLA to ARDROSSAN

Track ..... 160M

Distance ..... 84 nm

ARDROSSAN to YPAD

Track ..... 128M

Distance ..... 45 nm

**RSWT EXTRACT**

FL	-ISA	YBAS/YPAD
445	-56	2908062
385	-56	2903552
340	-52	3003054
300	-45	3003040
235	-32	3103030
185	-21	2802512

YBAS and YPAD are both SUITABLE for the period of possible use.

Your calculation of the minimum fuel required to be on board at start up for this flight is closest to -

19700 kg

(5 marks)

SEG	FL	DEV	M	TAS	TR	WV	WC	GS	DIST	ETI	AIRD	Fuel F	Zone F	SZW	MZW
									712						
TOC	-	+9	-	234	155	275/25	+12	-	41	10	39	-	1300	68500	
TOD	170	+9	0.462	291	157	275/25	+11	302	618	123	-	5857	11986	67200	61
YPAD	-	-	-	196	128	270/25	+20	-	54	15	49	-	1010		
APP													400		
												FF	14696		
												VR	1470		
												FR	3300		
												TS	100		
												ST	150		
												FOB	19716		

**QUESTION AFPA\_073**

Refer B727 Performance and Operating Handbook, ERC H2 and RSWT Extract.

A flight is enroute from DARWIN (YPDN) to TOWNSVILLE (YBTL) via J138. Current position is 99 nm past EGORE.

You have the following inflight data:

Cruise level ..... FL330  
 TMN ..... 0.79  
 Gross weight ..... 78600 kg  
 Useable Fuel on Board ..... 12820 kg

DARWIN is ACCEPTABLE, but may be considered SUITABLE if 30 minutes holding fuel is carried.  
 TOWNSVILLE is SUITABLE

**RSWT EXTRACT**

FL	-ISA	YPDN/EGORE	EGORE/BIDAG	BIDAG/YBTL
445	-56	3104560	3205060	2905061
385	-56	3004549	3206049	3006050
340	-52	3004041	2708040	2306043
300	-45	2306034	2702034	2605030
235	-32	2303016	2304016	2005022
185	-21	2002008	2003012	2002013

Your calculation of the position of the PNR/1-INOP, measured as a distance from DARWIN is closest to -

622 nm

(5 marks)

SEG	FL	DEV	M	TAS	TR	WV	WC	GS	DIST	ETI	AIRD	Fuel F	Zone F	SZW	MZW
YNTN	330	+12	0.79	471	113	265/80	+71/-2	540	191	21	-	4649	1644	78600	78
EGORE	200	+9	0.656	409	293	195/30	+3	412	290	42	-	4763	3353	76956	75
TOD	200	+13	0.646	406	295	196/20	+3	409	308	45	-	4611	3472	73603	72
YPDN	-	-		258	285	196/20	-1	-	73	17	73	-	585		
APP													400		
		Winds for FL 200 have been taken from RSWT at										FF =	9454		
		FL 185										Avail=	8473		
												over	981 kg		

**QUESTION AFPA\_073** (continued)

Flight Fuel Available	=	12820 kg	Useable fuel at fix (16 past EGOE)
	-	1500 kg	1-INOP fixed reserve
	-	<u>2000 kg</u>	30 minutes holding fuel for DARWIN
	÷	1.1	10% variable reserve
	=	8473 kg	
Flight Fuel used	-	9494 kg	
	=	-981 kg too much fuel used, so the PNR lies 981 kg closer to DARWIN	
PNR Adjustment	=	<u>Flight fuel difference</u>	<u>981 kg</u>
		SGR OUT + SGR HOME	8.6 kg/nm + 11.56 kg/nm
	=	49 nm closer to DARWIN	
	=	671 nm - 49 nm	
	=	622 nm from DARWIN	