2022 PU3 Midyear Examination
Paper 2 Answer Guide

Question 1

a. Statement of Contribution and Profit for the current year

	Legolas	Arwen	Total
	$	$	$
Sales	60 000	25 000	85 000
Less: **Variable cost**			
Raw materials	8 000	2 000	82 000
Direct labour	20 000	10 000	30 000
Machine running costs	12 000	3 000	15 000
	(40 000)	(15 000)	(55 000)
Contribution margin	20 000 (2M)	10 000 (2M)	30 000
Less: **Fixed Costs**			
Rent & rates			15 000
Insurance			600
			(15 600)
Net profit			14 400(2m)

b.

	Legolas	Arwen
Contribution Margin per unit	20 000/20000 = $1	10 000/10 000 = $1
Machine hour per unit	8000/20 000 = 0.4h	2000/10000 = 0.2h
Contribution margin per limiting factor	$2.50	$5.00
Ranking	2 [2m]	1[2m]

Optimal Production Plan

Product	Units to produce	MH used
Arwen	36 000 [1m]	7 200
Legolas	7 000 [1m}	2 800

c. Optimal Production Plan

Product	Units to produce	MH used
Arwen	8 000 [1m]	1600 (8000 x 0.2)
Legolas	8 000 [1m]	3 200 (8000 X 0.4)
Arwen	26 000 [1m]	5 200 [1m]
	[(10 000 – 1600 – 3200)/0.2]	10 000

Optimal Production Plan:
Arwen 34 000 units
Legolas 8000 units

Computation of profit based on Optimal Production Plan

	$
CM for Arwen (34000 X $1)	34 000
CM for Legolas (8000 X $1)	8 000
Contribution margin	42 000
Less: Fixed Costs	(15 600)
Profit	26 400

d. Points to consider

- ***Increase in demand for Legolas from 20000 to 40000 next year but Arwen contributes more with the limited machine hours (CM per machine hour is $5 but on $2.50 for Legolas).***

- Consider price increase for Legolas as demand is increasing and the wholesaler plans to increase its prices as well. Possibly by $2.50 to match Arwen's which will be higher than the wholesaler's price increase. Need to consider the impact of price increase on demand and the consumers' sensitivity to price increases.

- Maintain the Optimal Production Quantity as demand for Arwen has also gone up.

- Possibility of tying in quantity ordered of Legolas with that of Arwen eg. Buy 1 get 1 at 50% (ensure overall still profitable), etc

- Wholesaler promotion of Arwen to stimulate demand eg. Special promotion prices for limited period, etc

Any 2 X 2 m

Question 2

a) Accounts in marginal cost format

	City	Village	Park	Zoo	Total $
Turnover	960	1800	1100	720	4580
Variable operating expenses	670	800	510	740	2720
Contribution	290	1000	590	(20)	1860
Specific fixed costs	320	460	330	90	1200
Segment profit	(30)	540	260	(110)	660
General fixed overheads	110	190	140	140	580
Net profit					80

b)

Option 1: Closing both routes will improve the business' profits. (1)

The CM for Zoo is negative. This implies that for every trip it takes, the route will make a loss. Taking more trips will result in more losses for the business. To improve profits, Zoo route should be closed. (1)

While the CM for City is positive, its segment profit, which factors fixed costs directly attributed to City is negative. This means that it does not earn enough to cover the costs directly associated with City and reduces Beesy Buses' profits. (1)

Expected 20% savings to general overheads of $232 000 (580 000 X 20% X 2) will further improve the bottom line. (NP = 80 000 + 30 000 + 110 000 +232 000 = 452 for reference only)

Option 2: Better option than Option 1 (1)

On top of the benefits of Option 1, there is incremental profit from Village taking over a part of City's route (CM of $120 000) (1) while enjoying the savings on specific fixed costs and general fixed costs.(1). [NP = 80 000 + 30 000 + 110 000 +232 000 +(300 000 – 120 000 – 60 000) = 572 000 for reference only]

Option 3: New ticketing procedures will improve the overall contribution margin and hence, profits by $272 000. Individually, both City and Zoo will turn around and earn segment profits. (1). This may not be as profitable as Option 2 as there will be no savings in general fixed costs of $232 000. (1). The suggestion to re-apportion fixed cost equally between Village and Park is purely cosmetic and makes no difference to the overall profit of the business as the total fixed cost has to be incurred regardless as no routes are closed. (1) See table below.

Computation for marking reference only

FOR REFERENCE ONLY (Not needed to answer question)

Option 1: Profit statement

	Village	Park	Total $
Turnover	1800	1100	2 900
Variable operating expenses	800	510	1 310
Contribution	1000	590	1 590 (1m)
Specific fixed costs	460	330	790
Segment profit	540	260	800 (1m)
General fixed overheads			348
Net profit			452 (1m)

Alternative (Differential)	
Option 1	$
Net contribution of Village	540
Net contribution of Park	260
	800
Less general overheads ($580 less 40%)	348
Profit	452
Option 2	
As before	800
Add from city (300-180-60)	60
	860
Less general overheads (as above)	348
Profit	512

Option 2: Profit statement

		Village	Park	Total $
Turnover	(1800+300)	2100	1100	3 200
Variable operating expenses	(800 + 180)	980	510	1 490
Contribution		1120	590	1 710
Specific fixed costs	(460 + 60)	520	330	790
Segment profit		600	260	860
General fixed overheads	(40% X 580)			348
Net profit				512

Option 3:Profit Statement

	City	Village	Park	Zoo	Total $
Turnover	960	1800	1100	720	4580
Variable operating expenses	603	720	459	592	2374
Revised contribution	357	1080	641	128	2206
Specific fixed costs	320	460	330	90	1200
Segment profit	37	620	311	38	1006
General fixed overheads		290	290		580
Net profit	37	330	21	38	426

Note: Option 3 paints a false picture. Each route is profitable only because general overheads are offset against two routes only – the routes which give the highest net contribution.

c) The best solution is combining Option 2 with the revised ticketing procedures, keeping part of the City routes turnover and closing the Zoo routes. (1)

Revised net contribution of Village	620
Revised net contribution of Park	311
	931
Add from City [300-(180 X 0.9) -60]	78
	1009
Less general overhead ($580 less 40%)	348
Net profit	661

OR

Best Solution: Profit Statement

		Village	Park	Total $
Turnover	(1800 + 300)	2 100	1100	3 200
Variable operating expenses	720 + (90% X 180)	882	459	1269
Revised contribution	(1 080 + 138)	1218	641	1 931
Specific fixed costs	(460 + 60)	520	330	790
Net contribution		698	311	1 009
General fixed overheads	(580 X 40%)			348
Net profit				661

Question 3

(a) Production budget for the 3 months ending 30th November 2022

	August **(extra)**	September	October	November	Dec **(extra)**
Sales units	-	50,000	30,000	25,000	28,000
Add closing stock	65,000	42,500	39,000	44,000	47,000
	65,000	92,500	69,000	69,000	75,000
Less opening stock	-	65,000	42,500	39,000	44,000
Production units	65,000	27,500	26,500	30,000	31,000 #

(b)Raw materials budget for the 3 months ending 30th November 2012

	August	September	October	November
Production requirements	130,000	55,000 (27,500x2)	53,000	60,000
Add closing stock	55,000	53,000	60,000	62,000 # (to meet Dec prod)
Less opening stock	-	55,000	53,000	60,000
Units to purchase	185,000	53,000	60,000	62,000
Purchase costs	$240,000 *	$79,500	$90,000	$92,400
When to pay?(Cash budget)	Paid in Sept	Paid in Oct	Paid in Nov	

(c)Cash budget for the 3 months ending 30th November 2012

	September $	October $	November $
Receipts			
Cash sales	57,600	43,200	36 000
Debtors	-	576 000	432 000
Payments			
Creditors	240,000*	79,500	90,000
Direct labour	165,000	159,000	180,000
Production expenses	36,000	36,000	36,000
Selling expense	50,000	30,000	25,000
Fixed assets	-	-	50,000
	(433 400)	314 700	147 000
Bal b/d	200 000 (1)	(233 400)	81 300
Bal cld	(233,400)	81 300	228 300

(d)

- Budgets promote forward thinking and the identification of short-term objectives. ***(As a business grows, its operating environment becomes more complex and demanding, budgeting forces the managers step aside from day to day operations to look ahead and anticipate problems so that the business can be more prepared to deal with them)***

- Budgets play an important communication and coordination role in a business. It provides a means for managers to share their priorities for the future and communicate those priorities to others in the organisation. It also serves to communicate the policies and targets by every manager in the organisation responsible for carrying out a part of that plan. It helps to co-ordinate the activities of the different sections or departments of the business so that the activities of one complement those of another. It provides a single master plan to achieve the business' objectives. ***(As the business grows, communication and coordination becomes more challenging as the numbers of parties involved in running the business will also increase, having budgets allows the different parties to have a clear understanding of the direction and priorities of the business. The budgeting process also allows the different departments to communicate their challenges and constraints)***

- Budgets provide a basis for a system of control. Control is the review part of management functions where managers look back to determine if they have achieved the objectives set out in their plans. Corrective actions can be taken to improve future results if the objectives have not been met. Budgets provides a plan against which actual results can be progressively compared. ***(As a business grows, it becomes more difficult to discern the causes for a business' performance. Budgets and the related variances pinpoints areas for further investigation by management)***

- Budgets provide a useful benchmark for evaluating and rewarding employee performance. Budgets can be used as a yardstick in judging whether performances have been up to par. ***(As a business grows, there is greater distance between employees and their supervisors, budgets can provide an objective basis to discuss and evaluate performance.)***

- Budgets can motivate managers to better performance. Setting a required level of achievement can motivate managers better as it helps them relate their role to the organisation's overall objective. However, care needs to be taken to ensure that budgets are implemented correctly to avoid unintended effects on behaviour. ***(As the business grows, it may be more difficult for managers to connect their roles with organisational achievement, budgeting helps them see their contribution and provides clear direction which will help motivation).***

Any 2 X 2m (Link to growing business)

Question 4

(a) (i)Statement of computation of annual fixed cost of business

	$
Aircraft leasing	3 000 000
Operating license and aircraft maintenance	696 000
Landing fees – Singapore (1 500 X 360)	540 000
Landing fees – Okinawa (1200 X 360)	432 000
Aircrew and staff salaries	2 100 000
Fuel (10600 X 720)	7 632 000
Inflight meals (30 X 100 X 720)	2 160 000
	16 560 000

(ii)CM per passenger

= Sales - Variable cost

= $(340 + 10) – (25+35)

= $290

(iii)Breakeven no of passengers per annum = Fixed cost / CM per passenger

= 16 560 000/290

= 57 103.45

Average no of passengers per flight to breakeven = 57 103.45/720

= 79.31

= 80 passengers

(b) Breakeven no of biz class passengers

= (Fixed cost – CM from economy passengers)/CM per biz class passenger

= [16 560 000 – (290 X 50 x 90% X 720)] /[(510 +10) – (25 + 35)]

= (16 560 000 – 9 396 000)/460

= 15 573.91

Average no of biz class passengers per flight = 15 573.91/720

= 21.63

= 22 passengers per flight

(c)

Payback	NPV
▪ Evaluates in terms of time taken to recoup original investment (1m)	▪ Considers discounted cash flows over the life of the investment with original investment. (1m)
▪ Does not consider the time value of money. (1m)	▪ Discount factors are used take into consideration the opportunity cost of capital (1m)
▪ Useful for businesses concerned with liquidity	▪ Useful for businesses concerned with profitability

(c) (i)

Computation of Payback Period

Year	Savings $' 000	Cumulative savings
1	2 000	2000
2	4 000	6000
3	7 500	15 500 > 10 000 (additional $4000 needed – to pro – rate)
4	8 000	
5	(1 000)	

Payback period = 2 years and 6.4 mths (4000/7500 x 12) or 2 years 7 mths

(ii)

Computation of NPV

Year	Savings $' 000	Discount factors at 12%	NPV $'000
0	(10 000)		(10 000)
1	2 000	0.893	1 786
2	4 000	0.797	3 188
3	7 500	0.712	5 340
4	8 000	0.636	5 088
5	(1 000) + 5 000 = 4000	0.567	2 268
	Net present value	=	7 670

(f)

- Quality of the aircraft which may affect down time due to unexpected maintenance and affect the service provided to passengers in terms of unexpected delays.
- Reports on the safety features of the aircraft.
- The level of comfort offered by the aircraft and alignment to service strategy of the business.
- Reliability of engineering and efficiency reports.
- Reputation of the manufacturer.
- Training provided to pilots
- After sales service & warranty
- Any logical point

2 X 2m

(g) Buy the aircraft that costs $10 million. (1)

Payback period is shorter by 1yr 5 mths.(1)

NPV is lower by $30 000. (1)

Since biz is concerned about liquidity, it should choose the project which will allow it to recoup its original cost in a shorter time. (1)

Difference in NVP is only $30 000 which represents less than 1% of NPV and is too insignificant for the business to take on the higher risk of waiting 1.4 years longer. (1)