The Portable Garage Co (PCG) - Suggested Solution

(a)

Profit statement for current position:

	Division B $'000	Division A $'000	PGC Co $'000
Sales revenue:			
External sales (150,000 x $180/200,000 x $15)	27,000	3,000	30,000
Internal transferred sales (150,000 x $13)		1,950	
Total revenue	**27,000**	**4,950**	**30,000**
Variable costs:			
External material costs	6,750	1,050	7,800
Internal transferred costs	1,950		
Labour costs	5,250	1,400	6,650
Other costs of external sales		200	200
Total variable costs	**13,950**	**2,650**	**14,650**
Contribution	13,050	2,300	15,350
Less fixed costs	5,460	2,200	7,660
Profit	**7,590**	**100**	**7,690**

(b)

If Division B can buy adaptors from outside the group at $13 per unit, then the optimum position is for Division A to sell as many adaptors as possible to external customers at $15 each and then sell the remainder to Division B at a price to be agreed between them.

This would mean that Division A continues to sell Division B 150,000 adaptors but Division B then buys the remaining 30,000 adaptors from an external supplier. This is because the contribution per unit for Division A's external sales is $7 ($15 - $3 - $4 - $1). This means that for every external sale it loses, it forfeits $7 for the group. However, the incremental cost for the group of Division B buying adaptors from outside the group is only $6 ($13 external cost less the $7 cost of making them in-house). So, it makes sense for Division A to satisfy its external sales first before selling internally.

(c)

In order for Division A to supply Division B with 180,000 adaptors, it would have to reduce its external sales from 200,000 units to 170,000. This is because it only has enough spare capacity to supply Division B with 150,000 units at present after it has supplied adaptors to its external customers.

The minimum transfer price in situations where there is no spare capacity is marginal cost plus opportunity cost. In this case contribution is lost by not selling 30,000 units to the external customers. As the marginal cost for Division A's internal sales is $7 ($4 + $3) and the contribution per unit for external sales is $7 per unit ($15 - $3 - $4 - $1); the transfer price for the additional 30,000 units would need to be $14.

Marking Scheme

Part	Sub Part		Maximum marks	Marks awarded
a		External sales - A/B	1	
a		Internal sales - A	0.5	
a		External materials - A/B	1	
a		Internal costs - B	0.5	
a		Labour costs - A/B	1	
a		Other costs - A	1	
a		Fixed costs	0.5	
a		Profit - A/B	1	
a		PGC Co figures	2.5	
b		External contribution of $7 - A	1	
b		Incremental cost of $6	1	
b		External sales first - A	1	
b		150,000 from A/30,000 externally	1	
b		Explanation of approach	2	
c		Minimum transfer price (marginal cost + opportunity cost)	1	
c		Opportunity cost – lost contribution of $7	1	
c		Add marginal cost for transfer price of $14	1	
c		Explanation of approach	2	

The Alka Hotel - Suggested Solution

(a)

Breakeven point (in occupied room nights) = Fixed cost/contribution per room

$600,000/($180 - $60) = 5,000 occupied room nights

Margin of safety = (Budgeted room occupancy – breakeven room occupancy)/budgeted room occupancy

Total rooms available per annum: 365 days x 25 rooms = 9,125 rooms

Budgeted occupancy level: 9,125 x 70% = 6,387.5 rooms

Margin of safety: (6,387.5 – 5,000)/6,387.5 = 21.72%

(b)

Profit or loss for Q1

	$
Contribution (900 rooms x $120)	108,000
Fixed costs (($600,000/12) x 3)	150,000
Loss	42,000

The Alka Hotel should not close in Q1. The fixed costs will still be incurred and closure would result in lost contribution of $108,000. This in turn would result in a decrease in annual profits of $108,000. In addition the hotel could lose customers at other times of the year, particularly their regular business customers, who may perceive the hotel as being unreliable.

(c)

Contribution/sales ratio of Project 1

	$
Sales value of two room nights (2 x $67.50)	135
Sales value of a pair of theatre tickets	100
	235
Variable cost of two room nights (2 x $60)	120
Variable cost of a pair of theatre tickets	95
Contribution	20

C/S ratio (20/235)	8.51%

Breakeven point in revenue ($20,000/0.0851) $235,000

Alternatively:

Contribution per Theatre Package sold	$20
Breakeven point in Theatre Packages ($20,000/$20)	1,000
Breakeven point in revenue (1,000 x $235)	$235,000

The unit contribution per Theatre Package is low and it requires a large number of sales to breakeven. Each Theatre Package would require two room nights to be sold which would mean 2,000 room nights needed in Q1 to breakeven. The available rooms for Q1 are only 2,281.25 (9,125/4) and the Alka Hotel have already sold 900 rooms so there is insufficient capacity. Based on this Project 1 is not viable at the quoted prices.

(d)

Project 2 will cause the fixed costs of the hotel to rise from $600,000 per annum to $800,000 per annum for the hotel and restaurant combined. This is an annual increase of $200,000.

Revenue per occupied room will rise from $180 to $250 ($2,000,000/8,000 rooms) which reflects the extra guest expenditure in the restaurant.

The total cost predicted at a level of 8,000 occupied rooms is $1,560,000 which means the variable costs must be $760,000 ($1,560,000 - $800,000 fixed costs). This is a variable cost per occupied room of $95 which is an increase of $35. This reflects the variable costs of the restaurant.

As a result of these changes the breakeven point has increased from 5,000 to 5,161 occupied rooms so the hotel need to sell more room nights to cover costs.

However budgeted occupancy is now 7,300 occupied room nights which gives 80% occupancy (7,300/9,125). This gives a margin of safety of 2,139 occupied room nights or 29%. This is an increase on the current position and the hotel's position appears safer. At 7,300 occupied room nights the Alka Hotel's budgeted profit is $331,500 (7,300 x ($250 - $95)) - $800,000.

Marking Scheme

Part	Sub Part		Maximum marks	Marks awarded
a		Contribution	0.5	
a		BEP	1	
a		Total rooms available	1	
a		Budgeted occupancy	0.5	
a		Margin of safety %	1	
b		Profit/loss	1.5	
b		Recommendation	0.5	
b		Explanation	2	
c		C/S ratio	1	
c		BEP $ revenue	0.5	
c		Recommendation	0.5	
c		Explanation	2	
d		Calculations	4	
d		Commentary	4	

The Portable Garage Co (PCG)

This was a fairly typical transfer pricing question, testing candidates' understanding of how internal sales affect different divisions' profit figures, then moving on to more advanced understanding of the effect of transfer pricing on the group as a whole, as well as the individual divisions.

Requirement (a) was well attempted by most candidates, which you would expect to be the case as it involves some relatively simple calculations. The model answer doesn't require any further explanation, but some common mistakes were:

Layout

When asked to calculated profit for two or more divisions, as we are here, a columnar approach is by far the best method. Unfortunately the majority of candidates chose to calculate the profits for each division separately, writing out each cost/revenue separately.

Whilst this approach would be given full credit, it is time-consuming, and time is a scarce resource in any exam.

Not answering the full requirement

Possibly as a result of poor layout, many candidates failed to perform perhaps the simplest task of the requirement – add up the two divisions' figures to show PGC's results. I cannot stress enough how important it is to address every aspect of a requirement, and this is no exception.

Of those who did give a figure for PGC, many just gave the total profit. While this was given some credit, full credit could not be given – the requirement asked for a **profit statement**, which would be expected to show the breakdown of different revenue and cost types.

Using incorrect volumes

Perhaps as a result of being under time pressure and rushing, the most common technical mistake was to use incorrect sales volumes, for either division. We are told that B's maximum demand is 200,000, for example, but they only produce 150,000. It's important to read the scenario carefully, and make notes of the key figures.

Missing key information

The most commonly missed piece of information was the $1 'other' variable cost on external sales for Division A. Omitting this figure can only be as a result of not reading the scenario carefully enough. This omission was not as important as some of the errors already mentioned, but it was an otherwise straightforward mark that many candidates were not awarded.

Requirement (b) was the most poorly answered part of this question. Judging by the answers given, most candidates failed to recognise that the key to this question was considering what was best for the group. The requirement says that the new policy **will ensure the optimisation of group profits**, so we need to look from their perspective.

Many candidates discussed this from the point of view of each division. The buying division, B, doesn't really care where they get the components from – they cost $13 either way (ignoring quality differences, etc). The selling division, A, makes $7 contribution from an external sale, but only $6 from an internal sale, therefore will want to sell externally. This is true, and many answers came to the (correct) conclusion that A should continue to sell its 150,000 spare capacity to B, but the remaining 30,000 should be bought by B from the external source. Although this conclusion is correct, it could not be awarded full marks due to the lack of group focus. From the group's perspective, the internal transfer price is irrelevant (which is easy to see from the answer to (a) – it cancels out). The group has to make a decision here – would they rather B bought the components from A, meaning that A misses out on 30,000 external sales, or would they rather keep those sales, and have B buy the components externally.

Once you've identified that those are the only things to consider, this becomes a relatively simple make versus buy question. If A supplies the extra 30,000 units to B, the group loses out on the $7/unit external contribution A would have received. If B buys them for $13/unit, this costs PGC an extra $6 per unit (variable cost of production is $7, and $13 - $7 = 6). PGC would rather pay an extra $6 per unit than lose out on $7 contribution, so B should buy internally.

Finally, **requirement (c)** asked for the minimum transfer price for any extra adaptors supplied by Division A. This put candidates back on more familiar ground – most were able to identify that the minimum price is the lowest price that the selling division would accept. Many remembered that the minimum transfer price = marginal cost + opportunity cost. Unfortunately, few were able to apply this knowledge to the scenario.

Firstly, as the requirement states that this would be for any **additional adaptors supplied above the current level**, Division A does not have spare capacity to produce those units. Therefore, any additional units would mean that A would give up on external sales – this is where the opportunity cost arises. A significant minority of candidates stated that the opportunity cost was nil, as A has space capacity. As mentioned earlier, reading the requirement and scenario carefully can help prevent these errors.

The opportunity cost, therefore, is the contribution A would lose out on from its external sales. As mentioned earlier, this is $7 – occasionally $8 was given as an answer due to the omission of the extra external variable cost of $1, but this would still be a strong answer. Once the opportunity cost is identified, the minimum transfer price is then simply the variable cost + $7 = $14.

Finding this transfer price doesn't involve any complicated calculations, but it is important to address the requirement – **calculate and discuss**. Many candidates could not be awarded full marks because they simply gave the answer $14, with no explanation.

(Note that the $14 can also be reached by adjusting the external price of $15 by the $1 external cost. Full credit was given for this method and its explanation.)

The Alka Hotel

This question was centred on CVP analysis, although there was some decision-making and analysis to perform. It was generally well attempted, but really high scores were rare due to lack of depth to the answers to part (d).

Responses to **requirement (a)** were usually very good, with a significant proportion of candidates picking up full marks. It was clear that this topic, and the formulas required, had been covered by most candidates as part of their studies.

Requirement (b) was also generally well answered, although full marks were far rarer due to a lack of awareness of what our decision should be based on. Most were able to calculate the loss of $42,000. Unfortunately the most common answer given was to close in Q1, to prevent making this loss. Essentially this is a relevant costing issue – if we close in Q1, do we prevent the whole loss? A little bit more care would lead us to realise that the fixed costs are just that – fixed. If we close in Q1 we lose the contribution of $108,000, but the fixed costs remain. We could discuss if any of the fixed costs COULD be saved, but by that point we've done enough to realise that with the information given, closing the hotel is a bad idea.

Answer to **requirement (c)** became a bit more muddled. There was more information to deal with, so this is understandable, although it was pleasing to note that many candidates picked up marks through application of their knowledge, even if they had misunderstood some of the information given. The contribution per package or C/S ratio, were often incorrectly calculated, but breakeven revenue was still obtained, along with sensible discussion. Recommendations should follow from the results, so it was possible to come to a different conclusion to the suggested answer and still be given credit. It was again pleasing to see so many responses show consideration to the low contribution of this package, and how unlikely it would be to improve results.

As already mentioned, answers to **requirement (d)** often let candidates down. Interpretation of the breakeven chart was usually performed well – candidates were able to calculate important figures such as selling price and variable costs (and therefore contribution per unit). Stronger answers were able to analyse these in terms of the effect the new restaurant would have, and also whether it seemed to be a good idea or not. For example, many candidates were able to identify the new margin of safety, and would gain some credit for this. However, better answers would then discuss whether the hotel's position was better or worse – showing an understanding of what margin of safety means to a business. A conclusion, while not essential, could also give weight to an answer – overall, does it seem like a good idea or not?