

F5 December 2010 Question 4

- 4 The Gadget Co produces three products, A, B and C, all made from the same material. Until now, it has used traditional absorption costing to allocate overheads to its products. The company is now considering an activity based costing system in the hope that it will improve profitability. Information for the three products for the last year is as follows:

	A	B	C
Production and sales volumes (units)	15,000	12,000	18,000
Selling price per unit	\$7.50	\$12	\$13
Raw material usage (kg) per unit	2	3	4
Direct labour hours per unit	0.1	0.15	0.2
Machine hours per unit	0.5	0.7	0.9
Number of production runs per annum	16	12	8
Number of purchase orders per annum	24	28	42
Number of deliveries to retailers per annum	48	30	62

The price for raw materials remained constant throughout the year at \$1.20 per kg. Similarly, the direct labour cost for the whole workforce was \$14.80 per hour. The annual overhead costs were as follows:

	\$
Machine set up costs	26,550
Machine running costs	66,400
Procurement costs	48,000
Delivery costs	54,320

Required:

- Calculate the full cost per unit for products A, B and C under traditional absorption costing, using direct labour hours as the basis for apportionment. (5 marks)
- Calculate the full cost per unit of each product using activity based costing. (9 marks)
- Using your calculation from (a) and (b) above, explain how activity based costing may help The Gadget Co improve the profitability of each product. (6 marks)

(20 marks)

4 (a) Cost per unit under full absorption costing

Total annual overhead costs:	\$
Machine set up costs	26,550
Machine running costs	66,400
Procurement costs	48,000
Delivery costs	54,320
	<u>195,270</u>

Overhead absorption rate:

	A	B	C	Total
Production volumes	15,000	12,000	18,000	
Labour hours per unit	0.1	0.15	0.2	
Total labour hours	1,500	1,800	3,600	6,900

Therefore, overhead absorption rate = $\$195,270/6,900 = \$28.30$ per hour

Cost per unit:

	A	B	C
	\$	\$	\$
Raw materials ($\$1.20 \times 2/3/4\text{kg}$)	2.4	3.6	4.8
Direct labour ($\$14.80 \times 0.1/0.15/0.2\text{hrs}$)	1.48	2.22	2.96
Overhead ($\$28.30 \times 0.1/0.15/0.2\text{ hrs}$)	2.83	4.25	5.66
Full cost per unit	<u>6.71</u>	<u>10.07</u>	<u>13.42</u>

(b) Cost per unit using ABC costing

Cost drivers:

Cost pools	\$	Cost driver
Machine set up costs	26,550	36 production runs (16 + 12 + 8)
Machine running costs	66,400	32,100 machine hours (7,500 + 8,400 + 16,200)
Procurement costs	48,000	94 purchase orders (24 + 28 + 42)
Delivery costs	54,320	140 deliveries (48 + 30 + 62)
	<u>195,270</u>	
Cost per machine set up	$\$26,550/36 = \$737.50$	
Cost per machine hour	$\$66,400/32,100 = \$2.0685$	
Cost per order	$\$48,000/94 = \$510.6383$	
Cost per delivery	$\$54,320/140 = \$388$	

Allocation of overheads to each product:

	A	B	C	Total
	\$	\$	\$	\$
Machine set up costs	11,800	8,850	5,900	26,550
Machine running costs	15,514	17,375	33,510	66,400
Procurement costs	12,255	14,298	21,447	48,000
Delivery costs	18,624	11,640	24,056	54,320
	<u>58,193</u>	<u>52,163</u>	<u>84,913</u>	<u>195,270</u>
Number of units produced	15,000	12,000	18,000	
Overhead cost per unit	<u>3.88</u>	<u>4.35</u>	<u>4.72</u>	
Total cost per unit	A	B	C	
	\$	\$	\$	
Materials	2.4	3.6	4.8	
Labour	1.48	2.22	2.96	
Overheads	3.88	4.35	4.72	
	<u>7.76</u>	<u>10.17</u>	<u>12.48</u>	

4	(a)	Contribution per unit	2
		Overhead absorption rate	1
		Cost for A	1
		Cost for B	1
		Cost for C	1
			<u>5</u>
	(b)	Cost under ABC	
		Correct cost driver rates	5
		Correct overhead unit cost for A	1
		Correct overhead unit cost for B	1
		Correct overhead unit cost for C	1
		Correct cost per unit under ABC	1
			<u>9</u>
	(c)	Using ABC to improve profitability	1
		One mark per point about the Gadget Co	<u>6</u>
			<u>20</u>