

Activity based costing and absorption costing

Questions and Answers (A level)

Question 1

March 2019

B Limited produces two products – Premier and Standard. The budgeted cost information for the month of June 2019 is as follows:

	Premier	Standard
Units produced and sold	500	800
Direct materials per unit	\$80	\$50
Direct labour hourly rate	\$30	\$25
Direct labour hours per unit	3	2

Budgeted fixed overheads \$480 000 for 2019 are allocated to products based on 40 000 budgeted total direct labour hours.

Answer the following questions in the Question Paper. Questions are printed here for reference only.

- (a) Calculate the cost per unit for **each** product using absorption costing. [3]

Additional information

A newly recruited management accountant suggests that B Limited should adopt activity based costing (ABC). He has provided an analysis of fixed overheads as follows:

	Cost \$	Cost driver	Annual quantity
Materials requisition	90 000	Number of material requisitions	75
Machine set up	240 000	Number of setups	60
Inspection	150 000	Number of inspection hours	5000
	<u>480 000</u>		

Budgeted use of cost driver for each product for June 2019 is as follows:

	Premier	Standard
Number of material requisitions	2	6
Number of setups	2	3
Number of inspection hours	120	320

- (b) Explain the meaning of the term 'cost driver'. [2]
- (c) State **two** advantages and **three** disadvantages of ABC. [5]
- (d) Calculate the cost per unit for **each** product if ABC is adopted. [8]

Additional information

The selling price of **each** product is cost plus 40%.

(e) (i) Calculate the selling price of **each** product using absorption costing. [2]

(ii) Calculate the selling price of **each** product using ABC. [2]

(iii) Explain, using suitable calculations, why your answers in (i) and (ii) are different. [3]

[Total: 25]

Question	Answer	Marks																						
5(a)	<table><tr><td></td><td>Premier</td><td>Standard</td><td></td></tr><tr><td></td><td>\$</td><td>\$</td><td></td></tr><tr><td>Direct materials</td><td>80</td><td>50</td><td rowspan="3">} (1) for all (1) for both (1) OF for both</td></tr><tr><td>Direct labour</td><td>90</td><td>50</td></tr><tr><td>Fixed overheads</td><td><u>36</u></td><td><u>24</u></td></tr><tr><td>Cost per unit</td><td><u>206</u></td><td><u>124</u></td><td></td></tr></table> <div>Fixed overhead per unit $\frac{\\$480\,000}{40\,000} = \\12</div>		Premier	Standard			\$	\$		Direct materials	80	50	} (1) for all (1) for both (1) OF for both	Direct labour	90	50	Fixed overheads	<u>36</u>	<u>24</u>	Cost per unit	<u>206</u>	<u>124</u>		3
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5(b)	Cost driver is the factor that causes the change (1) in the cost of an activity. (1)	2																						

Question	Answer	Marks
5(c)	<p>Advantages</p> <p>ABC provides more reliable information for product costing, i.e. it is based on activity cost driver. (1)</p> <p>ABC facilitates pricing decision. (1)</p> <p>Disadvantages</p> <p>It is time consuming to implement ABC. (1)</p> <p>Determining the cost driver may be difficult. (1)</p> <p>Measuring the quantity of each cost driver consumed may be difficult. (1)</p> <p>It is costly because it may be necessary to employ a specialist to implement the ABC system. (1)</p> <p>Accept other valid points.</p> <p>Max 2 for advantages, Max 3 for disadvantages</p>	5

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5(d)	<table> <tr> <td></td><td>Premier</td><td>Standard</td><td></td></tr> <tr> <td></td><td>\$</td><td>\$</td><td></td></tr> <tr> <td>Direct materials</td><td>80</td><td>50</td><td>}</td></tr> <tr> <td>Direct labour</td><td>90</td><td>50</td><td>} (1) OF for all</td></tr> <tr> <td>Fixed overheads</td><td>28</td><td>36</td><td></td></tr> <tr> <td>Cost per unit</td><td><u>198</u> (1) OF</td><td><u>136</u> (1) OF</td><td></td></tr> </table> <table> <tr> <td></td><td>Premier</td><td>Standard</td><td></td></tr> <tr> <td></td><td>\$</td><td>\$</td><td></td></tr> <tr> <td>Materials requisition</td><td></td><td></td><td></td></tr> <tr> <td>2 × \$1200*</td><td>2 400</td><td></td><td>)</td></tr> <tr> <td>6 × \$1200</td><td></td><td>7 200</td><td>)(1)</td></tr> <tr> <td>Machine setup</td><td></td><td></td><td></td></tr> <tr> <td>2 × \$4000*</td><td>8 000</td><td></td><td>)</td></tr> <tr> <td>3 × \$4000</td><td></td><td>12 000</td><td>)(1)</td></tr> <tr> <td>Inspection</td><td></td><td></td><td></td></tr> <tr> <td>120 × \$30*</td><td>3 600</td><td></td><td>)</td></tr> <tr> <td>320 × \$30</td><td></td><td>9 600</td><td>)(1)</td></tr> <tr> <td>Total for June 2019</td><td><u>14 000</u></td><td><u>28 800</u></td><td></td></tr> <tr> <td>Units produced</td><td>+ 500</td><td>+ 800</td><td></td></tr> <tr> <td>Per unit</td><td>\$28 (1) OF</td><td>\$36 (1) OF</td><td></td></tr> </table> $* \frac{\$90\,000}{75} = \$1200 \text{ per requisition}$ $* \frac{\$240\,000}{60} = \4000 per setup $* \frac{\$150\,000}{5000} = \$30 \text{ per inspection hour}$			Premier	Standard			\$	\$		Direct materials	80	50	}	Direct labour	90	50	} (1) OF for all	Fixed overheads	28	36		Cost per unit	<u>198</u> (1) OF	<u>136</u> (1) OF			Premier	Standard			\$	\$		Materials requisition				2 × \$1200*	2 400)	6 × \$1200		7 200)(1)	Machine setup				2 × \$4000*	8 000)	3 × \$4000		12 000)(1)	Inspection				120 × \$30*	3 600)	320 × \$30		9 600)(1)	Total for June 2019	<u>14 000</u>	<u>28 800</u>		Units produced	+ 500	+ 800		Per unit	\$28 (1) OF	\$36 (1) OF		8
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5(e)(iii)	<p>Difference in price of Premier (\$288.40 – \$277.20) = \$11.20 Difference in price of Standard (\$173.60 – \$190.40) = \$16.80</p> <p>The difference in selling price is caused by the fixed overhead charged to each product (1) For Premier (\$36 – \$28) × 140% = \$11.20 (1) OF For Standard (\$36 – \$24) × 140% = \$16.80 (1) OF</p>		3																								

Question 2

October 2018

Source B1

F Limited was planning to introduce two new products, Product X and Product Y.

The relevant data were as follows.

	Product X	Product Y
units to be produced and sold each month	4000	1000
direct labour per unit	2 hours at \$8 per hour	4.8 hours at \$10 per hour
direct materials per unit	5 kilos at \$1.50 per kilo	6 kilos at \$4 per kilo
average number of hours to be worked by each production worker per month	200 hours	120 hours
average number of kilos of direct material in each order to be placed by the purchasing department	4000 kilos	1500 kilos
selling and distribution costs to be incurred by each product	\$19 200	\$6400

Total factory overheads arising from the introduction of Product X and Product Y are expected to be:

	\$
purchasing costs of direct material	9 360
employment overheads for direct labour	10 080
other factory overheads	<u>42 000</u>
	<u>61 440</u>

The directors' policy is to set a selling price based on a mark-up of 50% on total cost per unit.

The directors asked two employees, Abdul and Brian, **each** to prepare a calculation of the selling price which should be set.

Abdul decided to apportion the purchasing costs of direct material on the basis of the number of kilos purchased, and to apportion the employment overheads for direct labour on the basis of hours worked.

Abdul decided to apportion other factory overheads on the basis of units produced.

Answer the following questions in the Question Paper. Questions are printed here for reference only.

- (a) Prepare a statement to work out the proposed selling price per unit for **both** Product X and Product Y as calculated by Abdul. [11]

Additional information

Brian decided to apportion the purchasing costs of direct material on the basis of the number of orders being made, and to apportion the employment overheads for direct labour on the number of employees working in production.

Brian also decided to apportion other factory overheads on the basis of units produced.

- (b) Prepare a statement to work out the proposed selling price per unit for **both** Product X and Product Y as calculated by Brian. [9]
- (c) Explain to the directors how to proceed with the setting of the selling price. Support your answer with reference to your calculations in parts (a) and (b) together with any other factors. [4]
- (d) State **one** reason why selling and distribution costs are not included in a valuation of inventory suitable for inclusion in a statement of financial position. [1]

[Total: 25]

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*OF mark only awarded if selling price is expressed in dollars and cents (2 decimal places).																																																																																																																																				

Question	Answer	Marks
5(c)	<p>Use the pricing as calculated by Abdul / Brian (1)</p> <p>Brian's calculations have been made using activity-based costing (1) and are therefore on a more realistic basis. (1) Abdul has used absorption costing for his calculations. (1)</p> <p>Price setting should be done in comparison with the market rates for these products. (1) Some market research could be done (1) to see what customers would be prepared to pay. (1) To enable market penetration a lower mark-up could be applied at first. (1)</p> <p>Max 4 Accept other valid points.</p>	4
5(d)	<p>The goods are unsold and therefore selling and distribution costs have not been incurred (1)</p> <p>Selling and distribution costs are not included in cost of sales / are an expense in the income statement (1)</p> <p>Contravenes IAS 2. (1)</p> <p>Max 1 Accept other valid points.</p>	1

Question 3

October 2019

Young manufactures two products, Product X and Product Y. The following budgeted information is available.

	Product X	Product Y
Production units	5 000	5 000
Machine hours	10 000	20 000
Labour hours	5 000	7 500
Direct materials (per unit)	\$60	\$75
Direct labour (per hour)	\$25	\$30

Total production overheads, \$180 000, are to be allocated to each product on the basis of machine hours. A 50% mark-up will be added to the production cost of each product to set the selling price.

Answer the following questions in the Question Paper. Questions are printed here for reference only.

- (a) Calculate for **each** product the **unit** production cost **and** unit selling price. [7]

Additional information

On the advice of the management accountant, Young is considering using activity based costing (ABC) to allocate the production overheads to both products. The following information is available.

	\$	Product X	Product Y
Machine set up	120 000	20 times	10 times
Materials handling	45 000	10 receipts	5 receipts
Inspection	15 000	150 hours	100 hours
	<u>180 000</u>		

- (b) State what is meant by 'Activity Based Costing (ABC)'. [1]

- (c) Recalculate for **each** product the unit production cost **and** the unit selling price using ABC. [7]

- (d) (i) Calculate the difference between the unit production overhead charged to Product X and to Product Y using **each** method. [3]

- (ii) Calculate the difference between the unit selling price using the two costing methods for Product X and Product Y. [2]

- (e) Advise Young whether or not he should change the method of allocating production overhead costs to ABC. Justify your answer. [5]

[Total: 25]

Question	Answer				Marks
5(a)					7
		Product X		Product Y	
		\$		\$	
Direct materials	300 000)	375 000)	
Direct labour	125 000)	225 000)(1) all four	
Production overhead	60 000	(1)	120 000	(1)	
Total production cost	485 000		720 000		
	÷ 5 000		÷ 5 000		
Unit production cost	97	(1) OF	144	(1) OF	
50% mark-up	48.5		72		
Unit selling price	145.5	(1) OF	216	(1) OF	
	Per Unit				
		Product X		Product Y	
		\$		\$	
Direct materials	60)	75)	
Direct labour	25)	45)(1)	
Production overhead	12	(1)	24	(1)	
Unit production cost	97	(1) OF	144	(1) OF	
50% mark up	48.5		72		
Unit selling price	145.5	(1) OF	216	(1) OF	
5(b)	Activity based costing is a costing method to allocate production overhead to products according to the activities performed / cost drivers . (1)				1

Question	Answer										Marks
5(c)											7
		Product X		Product Y		Per unit	Product X		Product Y		
		\$		\$							
	Direct materials	300 000		375 000			60.0		75.0		
	Direct labour	125 000		225 000			25.0		45.0		
	Production overhead	119 000 }		61 000 } W1			23.8		12.2 } W1		
	Total production cost	<u>544 000</u>		<u>661 000</u>							
		÷ 5 000		÷ 5 000							
	Unit production cost	108.8 (1) OF		132.2 (1) OF			<u>108.8 (1) OF</u>		<u>132.2 (1) OF</u>		
	50% mark up	<u>54.4</u>		<u>66.1</u>			<u>54.4</u>		<u>66.1</u>		
	Unit selling price	<u>163.2 (1) OF</u>		<u>198.3 (1) OF</u>			<u>163.2 (1) OF</u>		<u>198.3 (1) OF</u>		
	W1	Total	X		Y	Per unit	X		Y		
		\$	\$		\$		\$		\$		
	Machine set up	120 000	80 000 }		40 000 } (1)		16.0 }		8.0 }	(1)	
	Materials handling	45 000	30 000 }		15 000 } (1)		6.0 }		3.0 }	(1)	
	Inspection	15 000	9 000 }		6 000 } (1)		1.8 }		1.2 }	(1)	
	<u>180 000</u>	<u>119 000</u>		<u>61 000</u>		<u>23.8</u>		<u>12.2</u>			

Question	Answer				Marks
5(d)(i)		Product X	Product Y		3
	Per unit	\$	\$		
	Production overhead				
	On machine hours	12.0	24.0	(1) OF	
	On ABC	23.8	12.2	(1) OF	
	Difference	<u>11.8</u>	<u>(11.8)</u>	(1) OF	
5(d)(ii)		Product X	Product Y		2
	Per unit	\$	\$		
	Original selling price	145.50	216.00		
	Selling price using ABC	<u>163.20</u>	<u>198.30</u>		
	Difference	<u>17.70</u>	<u>(17.70)</u>	(1)OF (1)OF	

Question	Answer	Marks
5(e)	<p>Possible answers:</p> <p>For (Max 2)</p> <p>More realistic / fair / reliable / relevant (1)</p> <p>Allows better pricing of the product (1)</p> <p>Avoids the arbitrary allocation of overheads (1)</p> <p>Against (Max 2)</p> <p>Complex / difficult to identify cost drivers (1)</p> <p>Time consuming (1)</p> <p>Costly / specialists may be required (1)</p> <p>Accept other valid points.</p> <p>Decision (1)</p>	5