

THE HONG KONG POLYTECHNIC UNIVERSITY
HONG KONG COMMUNITY COLLEGE

Subject Title : Cost Accounting

Subject Code : CCN2111

Session : Semester Two, 2017/18

Numerical answers

Question B1

Part I

(a) The company's DL budget:

	1st Q	2nd Q	3rd Q	4th Q
Required production in units	7,000	6,500	8,000	7,500
Direct labor time per unit (hours)	<u>× 0.35</u>	<u>× 0.35</u>	<u>× 0.35</u>	<u>× 0.35</u>
Total direct labor-hours needed	2,450	2,275	2,800	2,625
Direct labor cost per hour	<u>× \$10</u>	<u>× \$10</u>	<u>× \$10</u>	<u>× \$10</u>
Total direct labor cost	<u>\$ 24,500</u>	<u>\$ 22,750</u>	<u>\$ 28,000</u>	<u>\$ 26,250</u>

(b) The new DL budget

	1st Q	2nd Q	3rd Q	4th Q
Required production in units	7,000	6,500	8,000	7,500
Direct labor time per unit (hours)	<u>× 0.35</u>	<u>× 0.35</u>	<u>× 0.35</u>	<u>× 0.35</u>
Total direct labor-hours needed	2,450	2,275	2,800	2,625
Regular paid hours	<u>2,600</u>	<u>2,600</u>	<u>2,600</u>	<u>2,600</u>
Overtime hours paid	<u>0</u>	<u>0</u>	<u>200</u>	<u>25</u>
Wages for regular hours (@ \$10)	<u>26,000</u>	<u>26,000</u>	<u>26,000</u>	<u>26,000</u>
Overtime wages (1.4 x \$10 per hr)	<u>0</u>	<u>0</u>	<u>+2,800</u>	<u>+350</u>
Total direct labour cost	<u>26,000</u>	<u>26,000</u>	<u>28,800</u>	<u>26,350</u>

Part II

- (a)(i) COGS: variable
- (a)(ii) Shipping expense: mixed
- (a)(iii) Salaries and commissions: mixed
- (a)(iv) Insurance expense: fixed

(b) strawberries in a cannery: product cost

Question B2

Part I

(a) VR break-even:

$$\begin{aligned} \text{Segment CM ratio} &= \text{Segment contribution margin} \div \text{Segment sales} \\ &= \$281,600 \div \$440,000 = 0.640 \end{aligned}$$

$$\begin{aligned} \text{Dollar sales for a segment to break even} &= \text{Traceable fixed expenses} \div \\ &\text{Segment CM ratio} \\ &= \$100,000 \div 0.640 = \$156,250 \end{aligned}$$

(b) AR Division break-even:

$$\begin{aligned} \text{Segment CM ratio} &= \text{Segment contribution margin} \div \text{Segment sales} \\ &= \$240,000 \div \$400,000 = 0.600 \end{aligned}$$

$$\begin{aligned} \text{Dollar sales for a segment to break even} &= \text{Traceable fixed expenses} \div \\ &\text{Segment CM ratio} \\ &= \$88,000 \div 0.600 = \$146,666.67 \text{ or } \$146,667 \end{aligned}$$

(c) The company's overall break-even sales:

$$\begin{aligned} \text{CM ratio} &= \text{Contribution margin} \div \text{Sales} \\ &= \$521,600 \div \$840,000 = 0.621 \text{ (rounded)} \end{aligned}$$

$$\begin{aligned} \text{Total fixed expenses} &= \text{Total traceable fixed expenses} + \text{Common fixed} \\ &\text{expenses} \\ &= \$188,000 + \$168,000 = \$356,000 \end{aligned}$$

$$\begin{aligned} \text{Dollar sales to break even} &= \text{Total fixed expenses} \div \text{CM ratio} \\ &= \$356,000 \div 0.621 = \$573,268.92 \text{ (using the rounded CM ratio, } \sim \\ &\$573,312.88) \end{aligned}$$

(d) If the company operates at the break-even points for its two divisions, it will have a net operating loss of \$168,000 because it will not cover its common fixed expense.

Part II

Cost of beginning work in process inventory	\$30,000
Costs added to production during the month	+238,000
Total cost	<u>\$268,000</u>
Cost of ending work in process inventory	\$24,000
Cost of units transferred out	+244,000
Total cost	<u>\$268,000</u>

Question B3

Part I

(a)	Work in Process	76,000	
	Raw Materials		76,000
(b)	Manufacturing Overhead	15,000	
	Accounts Payable/Utility Payable		15,000
(c)	Work in Process	162,000	
	Manufacturing Overhead	70,000	
	Salaries Expense	120,000	
	Salaries and Wages Payable		352,000
(d)	Work in Process	92,720	
	Manufacturing Overhead		92,720
	[(170,800/140,000) × 76,000]		
(e)	Finished Goods	500,000	
	Work in Process		500,000

Part II

(a) Delivery cycle time = Wait time + Throughput time

$$\text{Wait time} = 26.2 \text{ days} - 6.6 \text{ days} = 19.6 \text{ days}$$

(b) MCE = Process time ÷ Throughput time

$$\text{Process time} = 0.5 \times 6.6 \text{ days} = 3.3 \text{ days}$$

(c) Throughput time

$$= \text{Process time} + \text{Inspection time} + \text{Move time} + \text{Queue time}$$

$$\begin{aligned} \text{Inspection time} &= 6.6 \text{ days} - 3.3 \text{ days} - 0.9 \text{ days} - 2.0 \text{ days} \\ &= 0.4 \text{ days} \end{aligned}$$

Question B4

Part I

(a)	Incremental revenue (7,800 units × \$49 per unit).....	\$382,200
	Less incremental costs:	
	Direct materials (7,800 units × \$17.8 per unit).....	138,840
	Direct labour (7,800 units × \$7.4 per unit).....	57,720
	Variable manufacturing overhead (7,800 units × \$6 per unit)	46,800
	Modifications (7,800 units × \$4.8 per unit).....	37,440
	Special moulds.....	50,000
	Total incremental cost.....	<u>-330,800</u>
	Incremental net operating income	<u>\$51,400</u>

(b) Accept/Yes.

Part II

(a) Computation of activity rates:

Activity Cost Pools	(a) Estimated Overhead Cost	(b) Total Expected Activity		(a) ÷ (b) Activity Rate	
Labor-related	\$69,300	6,300	DLHs	\$11	per DLH
Machine setups	\$8,000	800	setups	\$10	per setup
General factory	\$58,500	6,500	MHs	\$9	per MH

(b) Computation of the overhead cost per unit:

Activity Cost Pools and Activity Rates	R1		R2	
	Expected Activity	Amount	Expected Activity	Amount
Labor-related, at \$11 per DLH	2,400	\$26,400	3,900	\$42,900
Machine setups, at \$10 per setup	350	3,500	450	4,500
General factory, \$9 per MH	3,400	<u>30,600</u>	3,100	<u>27,900</u>
Total overhead costs assigned (a)		<u>\$60,500</u>		<u>\$75,300</u>
Number of units produced (b)		300		780
Overhead cost per unit (c)= (a) ÷ (b)		\$201.67		\$96.54

Answer either (a) or (c)

(c) Computation of unit product costs:

	R1	R2
Direct materials	\$240	\$280
Direct labor		
R1: (8 DLHs × \$14 per DLH)	112	
R2: (5 DLHs × \$14 per DLH)		70
Overhead	<u>201.67</u>	<u>96.54</u>
Unit product cost	<u>\$553.67</u>	<u>\$446.54</u>

Question B5

Part I

(a)	Make	Buy
Direct materials (11,000 units × \$6.20 per unit)	\$68,200	
Direct labor (11,000 units × \$6.10 per unit)	67,100	
Variable overhead (11,000 units × \$3.5 per unit)	38,500	
Foreman's salary (11,000 units × \$4.7 per unit).....	51,700	
Depreciation of special equipment (not relevant)	0*	
Allocated general overhead (avoidable only)	5,000	
Outside purchase price (11,000 units × \$26.2 per unit)		\$288,200
Opportunity cost.....		(58,000)
Total cost.....	<u>\$230,500</u>	<u>\$230,200</u>

*: either show dep is irrelevant or all other items are correct.

(b) Buy. The total cost of the buy alternative is lower by \$300 and net operating income will increase by \$300.

Part II

New CM\$ (120-12)x(10k+400)	\$1,123,200
Present CM\$ 120x10k	<u>(1,200,000)</u>
Change in CM\$	(76,800)
Add: Saving FC	<u>80,000</u>
Change in NOI	<u>\$3,200</u>

(other 5 rows incremental method (one column) is acceptable.)

Yes.
The NOI increases.

Question B6

Part I

(a)	LA	FA	YA
Selling price per unit.....	\$168.22	\$74.35	\$61.36
Variable cost per unit.....	140.28	58.42	49.88
Contribution margin per unit	<u>\$27.94</u>	<u>\$15.93</u>	<u>\$11.48</u>
Time on the constraint (minutes).....	2.8	1.2	1
Contribution margin per unit of the constrained resource.....	\$9.98	\$13.28	\$11.48
Ranking.....	3	1	2

Resulting ranking of products: FA, YA, LA

(b) The company is willing to pay up to \$9.98 per hour to obtain more of the constrained resource since this is the value added to the company of using this constrained resource to make more of product LA.

Part II

- (a) $SQ = 3,000 \text{ units} \times 8.8 \text{ pounds per unit} = 26,400 \text{ pounds}$
Materials quantity variance = $(AQ - SQ) \times SP$
= $(30,370 \text{ pounds} - 26,400 \text{ pounds}) \times \8.00 per pound
= $\$31,760 \text{ U}$
- (b) Materials price variance = $(AQ \times AP) - (AQ \times SP)$
= $(\$264,420) - (33,900 \text{ pounds} \times \$8.00 \text{ per pound})$
= $\$6,780 \text{ F}$
- (c) $SH = 3,000 \text{ units} \times 0.5 \text{ hours per unit} = 1,500 \text{ hours}$
Labor efficiency variance = $(AH - SH) \times SR$
= $(1,340 \text{ hours} - 1,500 \text{ hours}) \times \19.00 per hour
= $\$3,040 \text{ F}$
- (d) Labor rate variance = $(AH \times AR) - (AH \times SR)$
= $\$27,872 - (1,340 \text{ hours} \times \$19.00 \text{ per hour})$
= $\$2,412 \text{ U}$
- (e) $SH = 3,000 \text{ units} \times 0.5 \text{ hours per unit} = 1,500 \text{ hours}$
Variable overhead efficiency variance = $(AH - SH) \times SR$
= $(1,340 \text{ hours} - 1,500 \text{ hours}) \times \7.00 per hour
= $\$1,120 \text{ F}$
- (f) Variable overhead rate variance = $(AH \times AR) - (AH \times SR)$
= $\$8,844 - (1,340 \text{ hours} \times \$7.00 \text{ per hour})$
= $\$536 \text{ F}$