ACCT2121 Introductory Management Accounting

2020-2021 2nd Term

Suggested Solution

LQ1

A)

Actual operating income

	$	$
Sales revenue ($410 × 2,500)		1,025,000
Less: Direct materials	157,500	
Direct manufacturing labor ($28 × 6,250)	175,000	
Fixed expense	600,000	932,500
Operating income		92,500

B)

Static Budget operating income

	$	$
Sales revenue ($400 × 3,000)		1,200,000
Less: Direct materials ($56 × 3,000)	168,000	
Direct manufacturing labor ($50 × 3,000)	150,000	
Fixed expense	650,000	968,000
Operating income		232,000

C)

Flexible Budget operating income

	$	$
Sales revenue ($400 × 2,500)		1,000,000
Less: Direct materials ($56 × 2,500)	140,000	
Direct manufacturing labor ($50 × 2,500)	125,000	
Fixed expense	650,000	915,000
Operating income		85,000

D)

Sales-volume Variance

		$	$
Sales revenue ($1,000,000 – $1,200,000)			200,000 (U)
Less:	Direct materials ($140,000 – $168,000)	28,000 (F)	
	Direct manufacturing labor ($125,000 – $150,000)	25,000 (F)	
	Fixed expense ($650,000 – $650,000)	0	53,000 (F)
Operating income			147,000 (U)

E)

Flexible-budget Variance

		$	$
Sales revenue ($1,025,000 – $1,000,000)			25,000 (F)
Less:	Direct materials ($157,500 – $140,000)	17,500 (U)	
	Direct manufacturing labor ($175,000 – $125,000)	50,000 (U)	
	Fixed expense ($600,000 – $650,000)	50,000 (F)	17,500 (U)
Operating income			7,500 (F)

F)

Price variance for direct materials

= (Actual price of DM per input unit – Budgeted price of DM per input unit) × Total actual quantity of DM input

= ($157,500 / 17,500 – $56 / 8) × 17,500

= $35,000 (U)

G)

Efficiency variance for direct materials

= (Total actual quantity of DM input – Budgeted input quantity of DM for actual output) × Budgeted price of input

= (17,500 – 8 × 2,500) × $7

= $17,500 (F)

H)

Price variance for direct manufacturing labor

= (Actual price of DL per input unit – Budgeted price of DL per input unit) × Actual total quantity of DL input

= ($28 – $50 / 2) × 6,250

= $18,750 (U)

I)

Efficiency variance for direct manufacturing labor

= (Total actual quantity of DL input – Budgeted input quantity of DL for actual output) × Budgeted price of input

= (6,250 – 2 × 2,500) × $25

= $31,250 (U)

LQ2

A)

Spending variance for variable manufacturing overhead cost April 2021

= (Actual allocation rate of VMO – Budgeted allocation rate of VMO) × Total actual quantity of cost allocation base

= ($125,580 / 9,660 – $14) × 9,660

= $9,660 (F)

B)

Efficiency variance for variable manufacturing overhead cost April 2021

= (Actual quantity of cost allocation base – Budgeted quantity of cost allocation base for actual output) × Budgeted allocation rate of VMO

= (9,660 – 2,300 × 3.5) × $14

= $22,540 (U)

C)

Spending variance for fixed manufacturing overhead cost April 2021

= Actual fixed manufacturing overhead – Budgeted fixed manufacturing overhead

= $132,200 – $130,900

= $1,300 (U)

D)

Budgeted allocation rate of fixed manufacturing overhead

= $130,900 / (2,200 × 3.5)

= $17 per hour

Allocated fixed manufacturing overhead per unit

= $17 × 3.5

= $59.5 per unit

Production-volume variance for April 2021

= Flexible budget fixed manufacturing overhead – Fixed manufacturing overhead allocated

= $130,900 – $59.5 × 2,300

= $5,950 (F)

LQ3

A)

Contribution Margin Income Statements (Variable Costing) in February

	$	$
Sales revenue ($4,800 × 300)		1,440,000
Less: Cost of goods manufactured		
Variable manufacturing cost ($2,000 × 400)	800,000	
Less: Closing inventory		
($800,000 / 400 × 100)	200,000	600,000
Variable marketing cost ($600 × 300)		180,000
Contribution margin		660,000
Less: Fixed manufacturing cost	300,000	
Fixed marketing cost	100,000	400,000
Operating income		260,000

B)

Gross Margin Income Statements (Absorption Costing) in February

	$	$	$
Sales revenue ($4,800 × 300)			1,440,000
Less: Cost of goods manufactured			
Variable manufacturing cost			
($2,000 × 400)	800,000		
Manufacturing overhead absorbed			
($300,000 / 600 × 400)	200,000	1,000,000	
Less: Closing inventory			
($1,000,000 / 400 × 100)		250,000	
		750,000	
Add: Under-absorbed manufacturing			
overhead		100,000	850,000
Gross margin			590,000
Less: Variable marketing cost ($600 × 300)		180,000	
Fixed marketing cost		100,000	280,000
Operating income			310,000

C)

Statement to Reconcile Operating Income
under Variable Costing and Absorption Costing

	$
Operating income under absorption costing (W1)	345,000
Add: Fixed manufacturing overhead absorbed in closing inventory in February ($200,000 / 400 × 100)	50,000
	395,000
Less: Fixed manufacturing overhead absorbed in closing inventory in March ($150,000 / 300 × 50)	25,000
Operating income under variable costing	370,000

Difference in operating income in March under variable costing and absorption costing
= $370,000 – $345,000
= $25,000

W1:

Gross Margin Income Statements (Absorption Costing) in March

	$	$	$
Sales revenue [$4,800 × (100 + 300 – 50)]			1,680,000
Less: Cost of goods manufactured			
Opening inventory	250,000		
Variable manufacturing cost ($2,000 × 300)	600,000		
Manufacturing overhead absorbed ($300,000 / 600 × 300)	150,000	1,000,000	
Less: Closing inventory ($750,000 / 300 × 50)		125,000	
		875,000	
Add: Under-absorbed manufacturing overhead		150,000	1,025,000
Gross margin			655,000
Less: Variable marketing cost ($600 × 350)		210,000	
Fixed marketing cost		100,000	310,000
Operating income			345,000

LQ4

A)

	Alternative one	Alternative two
	$	$
Additional cost	–	(2,500)
Gain on selling of Unit A	400	3,000
Incremental income	400	500

Therefore, CKB Inc. should choose alternative two since it can bring higher incremental net income by $100 than alternative one.

B)

	Make	Accept
(Per unit)	$	$
Variable cost	90	–
Fixed cost	60	50
Purchasing cost	–	110
Total cost	150	160
Total cost of 2,000 units	300,000	320,000

Therefore, CKB Inc. should make 2,000 units of component by itself since the total cost is lower by $20,000 than accepting the external supplier's offer.

C)

	Keep	Replace
	$	$
Current disposal value of old equipment	–	(2,000)
Cost of purchasing new equipment	–	5,550
Cash operating cost	10,500	9,300
Total relevant cost	10,500	12,850

Therefore, CKB Inc. should keep the old equipment since the total relevent cost is lower by $2,350 than replacing with new equipment.

D)

	Accept special order
	$
Additional revenues ($45 × 10,000)	450,000
Opportunity cost (W1)	(120,000)
Additional variable manufacturing cost ($40 × 10,000)	(400,000)
Additional operating income	(70,000)

The operating income will decrease by $70,000 if the special order could be accepted.

W1:

Loss in original sales revenue + Decrease in variable manufacturing cost

= –$100 × 2,000 + $40 × 2,000

= –$120,000

E)

	Product X	Product Y	Product Z
	$	$	$
Sales revenue (W1)	720	1,014	1,080
Variable cost (W2)	(576)	(780)	(810)
Contribution margin	144	234	270

Therefore, CKB Inc. should focus on Product Z since the contribution margin per day that it brings is the highest among the three products.

W1:

Sales revenue of Product X

= $10 × (12 × 6)

= $720

Sales revenue of Product Y

= $13 × (13 × 6)

= $1,014

Sales revenue of Product Z

= $20 × (9 × 6)

= $1,080

W2:

Variable cost of Product X

= $8 × (12 × 6)

= $576

Variable cost of Product Y

= $10 × (13 × 6)

= $780

Variable cost of Product Z

= $15 × (9 × 6)

= $810

LQ5

A)

Units of Product P are budgeted to be produced in 2021

= Expected sales unit – Opening inventory + Closing inventory

= 640 – 46 + 74

= 668 units

B)

Units of Product Q are budgeted to be produced in 2021

= Expected sales unit – Opening inventory + Closing inventory

= 260 – 17 + 40

= 283 units

Dollar amount budgeted for purchase of Component Q in 2021

= Component Q required × Dollar amount per unit

= (283 – 70) × $2

= $426

C)

Statement to Calculate Total Budgeted Cost of Goods Sold in 2021

	$
Opening inventory (W1)	7,515
Add: Cost of goods manufactured (D)	115,815
	123,330
Less: Closing inventory (W2)	(14,430)
Total budgeted cost of goods sold	108,900

W1:

Manufacturing overhead per labor hour

= $28,925 / (4 × 668 + 11 × 283)

= $5 per labor hour

Opening inventory for Product P

= ($30 + $45 + $5 × 4) × 46

= $4,370

Opening inventory for Product Q

= ($40 + $90 + $5 × 11) × 17

= $3,145

Total opening inventory

= $4,370 + $3,145

= $7,515

W2:

Total closing inventory

= Closing inventory of Product P + Closing inventory of Product Q

= $95 × 74 + $185 × 40

= $14,430

D)

Statement to Calculate Total Budgeted Cost of Goods Manufactured in 2021

	$
Direct materials ($30 × 668 + $40 × 283)	31,360
Direct manufacturing labor cost ($45 × 668 + $90 × 283)	55,530
Total manufacturing overhead cost	28,925
Total budgeted cost of goods manufactured	115,815

LQ6

A)

	Only produce Product R	Only produce Product Q
Machine hours per unit	2	1
Units that can be produced	25,000	50,000
(Per unit)	$	$
Selling price	400	600
Variable manufacturing cost	(240)	(400)
Variable marketing cost	(60)	(140)
Contribution margin per unit	100	60
Contribution margin per hour	50	60
Total contribution margin	2,500,000	3,000,000
Budgeted total fixed overheads	(3,000,000)	(3,600,000)
Total operating income / (loss)	(500,000)	(600,000)

Therefore, 25,000 units of Product R should be produced to maximize ABC Inc.'s operating income as the total operating loss is lower by $100,000.

B)

When the annual capacity of the regular equipment increased by 15,000 hours:

	Only produce Product R	Only produce Product Q
Machine hours per unit	2	1
Units that can be produced	32,500	65,000
(Per unit)	$	$
Contribution margin per unit	100	60
Total contribution margin	3,250,000	3,900,000
Budgeted total fixed overheads	(3,600,000)	(4,200,000)
Total operating income / (loss)	(350,000)	(300,000)

Therefore, 65,000 units of Product Q should be produced to maximize ABC Inc.'s operating income as the total operating loss is lower by $50,000, which ABC Inc. should increase the capacity of the regular equipment by 15,000 hours since the total operating loss will be decreased.

C)

	Accept M Inc. order
	$
Additional revenues ($480 × 10,000)	4,800,000
Variable manufacturing cost for Product P ($280 × 10,000)	(2,800,000)
Variable marketing cost for Product P ($60 × 10,000)	(600,000)
Total contribution margin of Product P	1,400,000
Contribution margin of Product P per hour (1,400,000 / 10,000 / 2)	70

	Product R and Product P	Product Q and Product P
	$	$
Sales revenue (W1)	13,800,000	31,800,000
Variable manufacturing cost (W2)	($8,200,000)	($20,800,000)
Variable marketing cost (W3)	($1,950,000)	($6,900,000)
Contribution margin	$3,650,000	$4,100,000
Budgeted total fixed overheads	($3,600,000)	($4,200,000)
Total operating income	$50,000	($100,000)

Therefore, ABC Inc. should accept the order from M Inc. as the total operating income of producing Product R and Product P brings is the highest among the four options, including producing only Product R, only Product Q, Product R and Product P as well as Product Q and Product P. The product mix is 22,500 units of Product R and 10,000 units of Product P, which will maximize ABC Inc.'s operating income.

W1:

Sales revenue for Product R and Product P

= $400 × (45,000 / 2) + $480 × (20,000 / 2)

= $13,800,000

Sales revenue for Product Q and Product P

= $600 × 45,000 + $480 × (20,000 / 2)

= $31,800,000

W2:

Variable manufacturing cost for Product R and Product P

= $240 × 22,500 + $280 × 10,000

= $8,200,000

Variable manufacturing cost for Product Q and Product P

= $400 × 45,000 + $280 × 10,000

= $20,800,000

W3:

Variable marketing cost for Product R and Product P

= $60 × 22,500 + $60 × 10,000

= $1,950,000

Variable marketing cost for Product Q and Product P

= $140 × 45,000 + $60 × 10,000

= $6,900,000