Cost Accounting Foundations & Evolutions 10th edition Kinney Solutions Manual

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CHAPTER 2

Cost Terminology and Cost Behaviors

QUESTIONS

Q2-1. The term *cost* is used to refer to so many different concepts that an adjective must be attached to identify which particular type of cost is being discussed. For example, there are fixed costs, variable costs, period costs, product costs, expired costs, and opportunity costs, to name just a few.

Q2-2. A cost object is anything for which management wants to collect or accumulate costs. Before a cost can be specified as direct or indirect, the cost object must be identified. Since direct costs must be conveniently and economically traceable to the cost object, not knowing what the cost object in question is would make it impossible to identify direct costs. For example, if multiple products are made in the same production area, the salary of the area's manager would be direct to the production area but indirect to the different products. Indirect costs must be allocated in some rational and systematic manner to the cost object.

Q2-3. The assumed range of activity that reflects the company's normal operating range is referred to as the *relevant range*. Outside the relevant range, costs may be curvilinear because of purchase discounts, improved worker skill and productivity, worker crowding, loss in employee efficiency during overtime hours, etc. Although a curvilinear graph is more indicative of reality, it is not as easy to use in planning or controlling costs. Accordingly, accountants choose the range in which these fixed and variable costs are assumed to behave as they are defined (linear) and, as such, represent an approximation of reality.

Q2-4. It is not necessary for a causal relationship to exist between the cost predictor and the cost. All that is required is that there is a strong correlation between movement in the predictor and the cost. Alternatively, a cost driver is an activity that actually causes costs to be incurred.

The distinction between cost drivers and predictors is important because it relates to one of the objectives of managers: to control costs. By focusing cost control efforts on cost drivers, managers can exert control over costs. Exerting control over predictors that are not cost drivers will have no cost control effect.

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Q2-5. A product cost is one that is associated with inventory. In a manufacturing company, product costs would include direct material, direct labor, and overhead. In a merchandising company, product costs are the costs of purchasing inventory and the related freight-in costs. In a service company, product costs are those costs that are incurred to generate the services provided such as supplies, service labor, and service-related overhead costs.

In all three types of organizations, a period cost is any cost that is not a product cost. These costs are noninventoriable and are incurred in the nonfactory or nonproduction areas of a manufacturing company or in the nonsales or nonservice areas, respectively, of a retailer or service company. In general, these costs are incurred for selling and administrative activities. Many period costs are expensed when incurred, although some may be capitalized as prepaid expenses or other nonfactory assets.

Q2-6. Conversion costs are all production costs other than direct material costs; thus, conversion costs include the costs of direct labor and manufacturing overhead. These items are called conversion costs because they are needed to convert direct material into a salable product.

Q2-7. Factory overhead has been growing most rapidly because of the costs of technology. This cost category includes depreciation of factory and plant equipment, machinery maintenance cost, repair cost, some training costs, utilities expense to operate the machinery, and many costs related to quality control.

Q2-8. The only difference between the two systems is in their treatment of overhead. Under an actual cost system, actual overhead is added to production. Because actual overhead cannot be determined until the period ends, the overhead allocation occurs and product cost can be determined only at period-end. Under a normal cost system, a predetermined overhead rate is calculated before a period begins and is then used to apply overhead to products as production occurs.

The major advantage of using a normal cost system is that it allows a product's cost to be determined (estimated) at the time of production. Another major advantage is that a normal cost system provides a product cost that is stable across fluctuating levels of production and sales.

Q2-9. The cost of goods manufactured is the total production cost of the goods that were completed and transferred to Finished Goods Inventory during the period. This amount is similar to the cost of net purchases in the cost of goods sold schedule for a retailer. Since CGM is used in computing cost of goods sold, it appears on the income statement.

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EXERCISES

E2-10.

a. Direct
b. Direct
c. Direct
d. Indirect
e. Direct
f. Direct
g. Indirect
h. Direct
i. Direct

E2-11.

	COST OBJECT	
	Notebook	Plant
Touch pad and buttons	Direct	Direct
Glue	Indirect	Direct
Network connector	Direct	Direct
Battery	Direct	Direct
Paper towels used by line employees	Indirect	Direct
AC adapter	Direct	Direct
CD drive	Direct	Direct
Motherboard	Direct	Direct
Screws	Indirect	Direct
Oil for production machinery	Indirect	Direct

E2-12.

		COST OBJECT		
		Kennedy	Tax Services	Firm
a.	Four hours of Perkins's time	Direct	Unrelated	Direct
b.	Six hours of assistant's time	Direct	Direct	Direct
c.	Three hours of Morris's time	Indirect	Indirect	Direct
d.	Eight hours of CPE for Tompkin	Indirect	Direct	Direct
e.	One hour at lunch	Unrelated	Unrelated	Unrelated
f.	Two hours of Perkins's time	Direct	Unrelated	Direct
g.	One-half hour of Tompkin's time	Direct	Direct	Direct
h.	Janitorial wages	Indirect	Indirect	Direct
i.	Seven hours of Tompkin's time	Direct	Direct	Direct

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E2-13.

a. Cardboard, $0.40; cloth, $1; plastic, $0.50; depreciation, $0.60; superviors' salaries, $1.60; and utilities, $0.30; total cost, $4.40.

b. Cardboard, variable; cloth, variable; plastic, variable; depreciation, fixed; supervisors' salaries, fixed; and utilities, mixed.

c. If the company produces 10,000 caps this month, the total cost per unit will increase. The variable costs (cardboard, cloth, plastic) will remain constant per unit. The total cost for depreciation and supervisors' salaries will remain fixed, and, thus, will result in a higher cost per unit. The utility cost will go down in total but, because it is mixed, it is impossible (without other information) to estimate its total or per-unit cost. Without knowing the cost formula for utility costs, it is impossible to determine the total cost of making 10,000 caps.

E2-14.

a. and b.

	Per Unit	Per Set
Cardboard boxes ($1,000 ÷ 2,000)	$0.50	$0.50
Mallets ($12,000 ÷ 4,000)	3.00	6.00
Croquet balls ($9,000 ÷ 12,000)	0.75	4.50
Wire hoops ($3,600 ÷ 24,000)	0.15	1.80
Production worker wages ($8,400 ÷ 2,000)	?	4.20
Supervisor's salary ($2,600 ÷ 2,000)	?	1.30
Building and equipment rental ($2,800 ÷ 2,000)	?	1.40
Utilities ($1,300 ÷ 2,000)	?	0.65
Total		$20.35

c. Estimated cost per set in March is:

Cardboard boxes ($1,000 ÷ 2,000)	$0.50
Mallets ($12,000 ÷ 4,000; $3 × 2)	6.00
Croquet balls ($9,000 ÷ 12,000; $0.75 × 6)	4.50
Wire hoops ($3,600 ÷ 24,000; $0.15 × 12)	1.80
Production worker wages ($8,400 ÷ 2,000)	4.20
Supervisor's salary ($2,600 ÷ 2,500)	1.04
Building and equipment rental ($2,800 ÷ 2,500)	1.12
Utilities ($1,400 ÷ 2,500)	0.56
Total	$19.72

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E2-15.

a.

Total fixed cost	$ 37,500	
Total variable cost (15,000 tickets × $10)	150,000	
Total cost	$187,500	

b.

Total cost	$187,500	
Desired profit margin (15,000 tickets × $8)	120,000	
Total sales price	$307,500	
Divided by assumed number of tickets sold	÷ 15,000	
Selling price per ticket	$ 20.50	

c.

Total revenue (5,000 tickets × $20.50)		$102,500
Total cost:		
Fixed	$37,500	
Variable (5,000 × $10)	50,000	(87,500)
Net profit		$ 15,000

d. The assumption made was that 15,000 tickets would be sold. The fraternity should have been informed that the fixed cost per ticket would vary, depending on the number of tickets sold. By spreading the fixed cost over fewer tickets, the fraternity would make less profit as ticket sales declined.

e.

Total revenue (20,000 tickets × $20.50)		$ 410,000
Total cost:		
Fixed	$ 37,500	
Variable (20,000 × $10)	200,000	(237,500)
Net profit		$ 172,500

E2-16.

a. (1) 200 returns:
Total cost = $2,000 + ($9 × 200) = $3,800
Cost per unit = $3,800 ÷ 200 = $19.00

(2) 500 returns:
Total cost = $2,000 + ($9 × 500) = $6,500
Cost per unit = $6,500 ÷ 500 = $13.00

(3) 800 returns:
Total cost = $2,000 + ($9 × 800) = $9,200
Cost per unit = $9,200 ÷ 800 = $11.50

b. The fixed cost per unit varies inversely with activity. Therefore, as the activity (tax returns prepared) increases, the fixed cost per unit decreases.

c. $15,000 ÷ 200 = $75; $75 + $19 = $94 fee to charge per return
$94 × 800 = $75,200 total fees; $75,200 – $9,200 = $66,000

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E2-17.

a. (1) Number of clients contacted, number of new clients generated, number of miles traveled (if driving), number of nights away from home.

(2) Number of supplies requisitions, number of hours worked, number of copies made

(3) Purchase price of computers and depreciation method chosen (number of hours of computer usage, number of hours worked, expected years of service)

(4) Number of hours worked, number of times maintenance crew visits the accounting firm, number of months in period (if maintenance is a strict fixed cost per month)

b. The distinction between a cost predictor and a cost driver is whether the activity measure actually causes the cost to be incurred. A cost predictor is merely an activity that changes with changes in the cost. A cost driver *causes* costs to be incurred. Of the costs addressed in (a), cost drivers that could also be cost predictors would be (1) number of miles traveled, (2) number of times supplies are requisitioned, (3) number of hours worked, and (4) number of times maintenance visited the accounting firm.

E2-18.

a. Number of patients processed
b. Number of patients scheduled
c. Number of surgeries scheduled
d. Number of surgeries scheduled
e. Number of tests ordered
f. Number of patients getting tests (if all tests are performed in same lab at the same time) or number of tests ordered (if patient has to be moved to multiple labs or for multiple tests)
g. Number of lab tests administered
h. Number of patients moved
i. Number of surgeries performed
j. Number of surgeries performed
k. Number of medications administered
l. Number of patients moved
m. Number of patients discharged (it is possible that not all patients are discharged)
n. Number of insurance companies to be billed

E2-19.

a. V, PT (could be mixed)
b. V, PD
c. F, PD
d. V, PT
e. F, PT
f. V, PT (could be fixed if paper towel rolls are replaced at specific intervals regardless of need)
g. F, PD (could be product if assistants are assigned to work on specific projects)
h. V, PT (could be fixed)
i. V, PT
j. V, PT
k. F, PT (would be fixed because it was charged for the truckload rather than for an individual piece of furniture; may be considered a period cost and not attached to the individual pieces of furniture)

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E2-20.

a. F, OH
b. V, DM
c. V, DM
d. V, OH (assuming cost is insignificant)
e. V, DM
f. F, OH
g. V, DM
h. F, OH
i. F, OH
j. V, DM
k. V, DL
l. V, DM
m. V, DM
n. V, DM

E2-21.

a. $600,000 – $60,000 = $540,000 depreciable cost
$540,000 ÷ 10 years = $54,000 depreciation per year
(480 ÷ 600) ($54,000) = $43,200 is expired cost (part of product OH)

b.

Cost of goods sold:	$43,200
Finished goods inventory:	$10,800

E2-22.

a.

One month of insurance ($18,600 ÷ 6)	$ 3,100
Bonus to corporate president	10,000
Utility cost on headquarters ($20,000 × 0.40)	8,000
Total	$21,100

b.

Five months of insurance ($18,600 × 5/6)	$15,500
Seminar fee	1,000
Total	$16,500

c.

Property taxes ($15,000 × 1/3)	$ 5,000
Utility cost on factory ($20,000 × 0.60)	12,000
Total	$17,000

d. Product costs are assigned to products made; thus, the costs cannot be classified as expired or unexpired because it is not known whether the associated products made during May were sold. If sold, the costs would be expired; if unsold, the costs would be unexpired and be accumulated in the Finished Goods account.

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E2-23.

a. Mfg.
b. Mfg., Mer., Ser.
c. Mfg., Mer., Ser.
d. Mer. (although manufacturers might refer to Finished Goods Inventory in this manner)
e. Mfg., Mer., Ser.
f. Mfg.
g. Ser.
h. Mfg., Mer.
i. Mfg., Ser.

E2-24.

a. high
b. low
c. low
d. high
e. high
f. high
g. moderate
h. high
i. high
j. moderate or low

E2-25.

a. Rivets and aluminum = $12,510 + $1,683,000 = $1,695,510
The janitorial supplies and the sealant are indirect materials.

b. Aluminum cutters and welders = $56,160 + $156,000 = $212,160
The janitorial wages and factory supervisors' salaries are indirect labor.
The salespeople's salaries are period costs.

E2-26.

a. Stainless steel, plastic, and wood blocks = $800,000 + $5,600 + $24,800 = $830,400

b. $500,000 (equipment operators)

c. $6,000 indirect material (equipment oil and grease)
$82,000 + $272,000 = $354,000 indirect labor (mechanics and supervisors)

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E2-27.

Direct material:		
Mulch	$ 320	
Landscaping rock	1,580	
Plants and pots	1,950	$3,850
Direct labor:		
Trumble's salary		
($3,000 ÷ 20 = $150 per day; $150 × 2 days to design)	$ 300	
Gardeners' wages		
($3,840 ÷ 20 = $192 per day; $192 × 5 days to complete)	960	$1,260
Overhead:		
Allocated depreciation ($200 ÷ 20 work days)	$ 10	
Construction permit	95	
Allocated rent		
(150 ÷ 3,000 = 5%; $2,400 × 0.05 = $120; $120 ÷ 30 = $4 per day × 2 days)	8*	
Allocated utility bills		
($1,800 × 0.05 = $90; $90 ÷ 30 =$3 per day × 2 days)	6*	$ 119

**Note:* The rent and utility bills were allocated only because of the designer's use of space in the company offices. Given the immaterial amount of these allocations, Carolyn Gardens may simply want to treat these costs as period costs rather than attempting to trace them to individual jobs. Thus, an answer of $105 for overhead would also be reasonable.

E2-28.

a. 6,000 total hours – 5,000 regular hours = 1,000 overtime hours

b. Direct labor: 5,000 hours × $9 per hour = $45,000
Overhead: $54,000 – $45,000 = $9,000

c. Shift premiums:
Second-shift premium: 10% × $9 = $0.90
Overtime premium: 75% × $9 = $6.75

Overhead costs:
Second-shift premium: 2,500 hours × $0.90 = $2,250
Overtime premium: 1,000 hours × $6.75 = $6,750

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E2-29.

a. 32,000 total hours – 27,000 regular hours = 5,000 overtime hours

b. Direct labor: 32,000 hours × $12 per hour = $384,000
Overhead: $435,600 – $384,000 = $51,600

c. Shift premiums:
Second-shift premium: 8% × $12 = $0.96
Third-shift premium: 12% × $12 = $1.44
Overtime premium: 50% × $12 = $6.00

Manufacturing overhead costs:
Second-shift premium: 9,000 hours × $0.96 = $8,640
Third-shift premium: 9,000 hours × $1.44 = $12,960
Overtime premium: 5,000 hours × $6.00 = $30,000

E2-30.

a. Property tax overhead cost for February = $48,000 ÷ 12 = $4,000
Property tax OH cost for remainder of year = $44,000
Actual Feb. OH costs = $530,000 – $124,000 – $44,000 + $81,000 = $443,000

b. February OH cost per unit = $443,000 ÷ 50,000 = $8.86
Total product cost in February = $24.30 + $10.95 + $8.86 = $44.11

c. If actual costs are used, product costs will differ each period. For example, January utility cost per unit was ($124,000 ÷ 50,000), or $2.48, compared to February's cost per unit of ($81,000 ÷ 50,000), or $1.62. However, a normal cost system uses a predetermined overhead rate that provides a smoothing effect to overhead cost variations over an annual period.

E2-31.

Direct material used	$ 24,000
Direct labor	126,000
Overhead	42,000
Current manufacturing costs	$192,000
Less increase in work in process inventory	(23,000)
Cost of goods manufactured	$169,000

Since Work in Process Inventory increased by $23,000, current manufacturing costs must have been $23,000 more than cost of goods manufactured.

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E2-32.

a.

Beginning WIP inventory		$ 372,000
Raw material used	$612,000	
Direct labor	748,000	
Manufacturing overhead	564,000	1,924,000
Total cost to account for		$ 2,296,000
Ending WIP inventory		(436,000)
Cost of goods manufactured		$ 1,860,000

Note: The beginning and ending balances of Raw Material Inventory are not used because no information is given on raw material purchases for the month but the amount of RM used is specifically provided.

b.

Beginning FG inventory	$ 224,000
Cost of goods manufactured	1,860,000
Cost of goods available for sale	$2,084,000
Ending FG inventory	(196,000)
Cost of goods sold	$1,888,000

E2-33.

a.

Irresistible Art Schedule of Cost of Goods Manufactured For the Month Ended July 31		
Beginning WIP inventory		$ 146,400
Beginning RM inventory	$ 93,200	
Raw material purchased	656,000	
Raw material available	$ 749,200	
Ending RM inventory	(69,600)	
Raw material used	$ 679,600	
Indirect material used (plugged)	(175,600)	
Direct material used (given)		504,000
Direct labor ($788,000 × 0.75)		591,000
Overhead:		
Various (given)	$ 600,000	
Indirect material (from above)	175,600	
Indirect labor ($788,000 × 0.25)	197,000	972,600
Total cost to account for		$2,214,000
Ending WIP inventory		(120,000)
Cost of goods manufactured		$2,094,000

b.

Irresistible Art Schedule of Cost of Goods Sold For the Month Ended July 31	
Beginning FG inventory	$ 72,000
Cost of goods manufactured	2,094,000
Goods available for sale	$2,166,000
Ending FG inventory	(104,800)
Cost of goods sold	$2,061,200

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E2-34.

a.

Targé Co. Cost of Goods Sold Schedule For the Month Ended March 31	
Beginning FG inventory	$125,000
Cost of goods manufactured	2,537,500
Cost of Goods available for sale	$2,662,500
Ending FG inventory *(given)*	(18,400)
Cost of goods sold *(given)*	$2,644,100

b.

Targé Co. Cost of Goods Manufactured Schedule For the Month Ended March 31		
Beginning WIP inventory (given)		$ 90,000
Direct material:		
Beginning DM inventory (given)	$ 30,000	
Direct material purchased	1,182,000	
Direct material available	$1,212,000	
Ending DM inventory (given)	(42,000)	
Direct material used		1,170,000
Direct labor		400,000
Overhead		900,000
Total cost to account for		$2,560,000*
Ending WIP inventory ($90,000 × 0.25)		(22,500)
Cost of goods manufactured [from (a)]		$2,537,500

* Total cost to account for = Beg. WIP + DM used + DL + OH
$2,560,000 = $90,000 + $1,170,000 + DL + OH
DL + OH = $2,560,000 – $90,000 – $1,170,000
DL + OH = $1,300,000
OH = 225% of DL = 2.25 DL
DL + 2.25 DL = $1,300,000
3.25 DL = $1,300,000
DL = $400,000
OH = $400,000 × 2.25 = $900,000

c. Prime cost = DM + DL
= $1,170,000 + $400,000
= $1,570,000

d. Conversion cost = DL + OH
= $400,000 + $900,000
= $1,300,000

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E2-35.

a.

Work in Process Inventory	5,000	
Supplies Inventory		5,000
To record supplies usage for audit engagements		
Travel Expense	8,000	
Cash		8,000
To record travel expenses for partner		
Fixed Overhead Control	6,500	
Accumulated Depreciation—Laptops		6,500
To record laptop depreciation		
Depreciation Expense	52,500	
Fixed Overhead Control	97,500	
Accumulated Depreciation—Building		150,000
To record depreciation on NYC building		
Work in Process Inventory	200,000	
Salaries Payable		200,000
To accrue partner salaries		
Work in Process Inventory	257,900	
Salaries Payable		257,900
To accrue audit salaries		
Work in Process Inventory	19,400	
Cash		19,400
To record audit-related travel costs		
Insurance Expense	6,055	
Fixed Overhead Control	11,245	
Prepaid Insurance and Taxes		17,300
To record expiration of prepaid insurance and property taxes on downtown building		
Variable Overhead Control	3,400	
Wages Payable		3,400
To accrue secretarial wages		
Salaries Payable	457,900	
Wages Payable	3,400	
Cash		461,300
To pay accrued salaries and wages		

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b. Cost of Services Rendered:

Supplies used			$ 5,000
Labor:	Partner salaries	$200,000	
	Audit salaries	257,900	457,900
Overhead:	Laptop depreciation	$ 6,500	
	Depreciation on building	97,500	
	Travel	19,400	
	Insurance and taxes	11,245	
	Indirect labor	3,400	138,045
Total cost of services rendered			$600,945

E2-36.

Direct labor ($8,100 + $3,140)		$11,240
Overhead:		
Supplies ($2,400 – $1,200)	$1,200	
Utilities ($2,000 × 0.90)	1,800	
Office salaries ($1,900 × 0.20)	380	
Depreciation	3,700	
Building rental ($3,100 × 0.80)	2,480	9,560
Cost of services rendered		$20,800

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PROBLEMS

P2-37.

Type of Cost	Variable	Fixed	Direct	Indirect	Period	Product
Paint	X		X			X
Spirits	X		X			X
Brushes	X		X			X
Overalls		X		X		X
Ad		X			X	
Assistant	X		X			X
Oper. Costs*	X			X		X
Map		X		X		X
Tolls	X		X			X
Phone		X			X	X

*Some variable costs would be direct if miles to and from particular jobs are recorded.

P2-38.

a. At 80,000 boxes per month:

Material and labor costs ($79,000 ÷ 500)	$158.00
Overhead ($408,000 ÷ 80,000)	5.10
Total cost per box	$163.10

b. At 120,000 boxes per month:

Material and labor costs ($79,000 ÷ 500)	$158.00
Overhead ($408,000 ÷ 120,000)	3.40
Total cost per box	$161.40

c.

Material and labor (excluding labor design)	$118.00
Overhead	3.40
Total	$121.40

Cost at 80,000 boxes	$163.10
Cost at 120,000 boxes (excluding labor design)	(121.40)
Maximum labor design costs	$ 41.70

d. At 80,000 boxes:

Sales ($195 × 80,000 boxes)	$ 15,600,000
Cost of sales ($163.10 × 80,000 boxes)	(13,048,000)
Gross margin	$ 2,552,000

Desired gross margin	$ 2,552,000
Cost of sales ($161.40 × 120,000 boxes)	19,368,000
Sales needed	$ 21,920,000

$21,920,000 ÷ 120,000 boxes = $182.67 sales price per box

e. No, the variable costs per box are constant and the fixed costs remain the same in total at any level of production.

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P2-39.

a. At 150,000 meals per month:

Material and labor costs ($9,320 ÷ 2,000)	$ 4.66
Overhead ($1,200,000 ÷ 150,000)	8.00
Total cost per meal	$12.66

b. At 300,000 meals per month:

Material and labor costs ($9,320 ÷ 2,000)	$ 4.66
Overhead ($1,200,000 ÷ 300,000)	4.00
Total cost per meal	$ 8.66

c.

Material and labor (excluding meat) ($5,720 ÷ 2,000)	$ 2.86
Overhead at 300,000 meals	4.00
Total cost without meat	$ 6.86
Cost at 150,000 meals	$12.66
Cost at 300,000 meals (excluding meat)	(6.86)
Maximum meat cost per meal	$ 5.80
Current meat cost ($3,600 ÷ 2,000)	(1.80)
Potential increase in meat cost	$ 4.00

d. $21.92 ÷ 2 = $10.96 maximum cost per meal

Maximum meal cost	$10.96
Current costs for material and labor	(4.66)
Cost per unit for overhead	$ 6.30

Overhead ÷ Cost per unit = Total meals
$1,200,000 ÷ $6.30 = 190,476 or 192,000 if meals must be produced in 2,000 unit batches

e. The firm would be less profitable if the manager decided to produce 192,000 dinners but could sell only the same 150,000 the company is currently selling. The manager might accept retaining the business to boost his reputation as a "deal-maker" so as to obtain another position before the financial results were reported.

Current profitability:

Sales (150,000 × $25.32)	$ 3,798,000
Variable cost of meals (150,000 × $4.66)	(699,000)
Fixed overhead	(1,200,000)
Profitability	$ 1,899,000

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P2-40.

a.

printing invitations:	step fixed
preparing the theater:	step fixed
postage:	variable
building stage sets:	fixed
printing programs:	fixed
security:	fixed
script:	fixed

b. Members attending = 300 × 0.60 = 180 members
Attendance estimate = 180 + [(90 × 1) + (90 × 2)] = 450 people

Fixed and step fixed costs =
$360 + $900 + $1,800 + $350 + {3 × [$110 + (5 × $30)]} + $2,000 = $6,190

Variable cost = $0.60 × 450 = $270

Total cost = $6,190 + $270 = $6,460

c. $6,460 ÷ 450 = $14.36 (rounded)

d. Member attendance = 300 × 0.90 = 270
Attendance estimate = 270 + (270 × 2) = 810 people

Fixed and step fixed costs =
$450 + $1,200 + $1,800 + $350 + {3 × [$110 + (5 × $30)]} + $2,000 = $6,580

Variable cost = $0.60 × 810 = $486

Total cost = $6,580 + $486 = $7,066

Cost per person = $7,066 ÷ 810 = $8.72 (rounded)

The reduction in per-person cost is caused by the fact that, even though some of the step fixed costs increase, the total fixed costs are spread over more attendees.

P2-41.

1. C
2. H
3. D
4. L
5. E
6. G
7. A
8. F
9. J

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P2-42.

a. Determining the cost of a product merely involves tracing direct costs to production and finding some systematic method of allocating indirect production costs to products. Controlling these costs involves completely different issues. Control of production costs requires a focus on both the product costs and the related cost drivers. Such costs can be controlled only by controlling the activity levels of the main production cost drivers.

b. The advancement of technology does make costs more difficult to control. As technology has become more pervasive in manufacturing, the indirect manufacturing costs have grown relative to production volume. Hence, controlling production volume has little to do with the control of more and more production costs. Further, with the growth in the indirect costs (such as automated technology depreciation), it is more difficult to trace production costs to specific products. This difficulty adds to the complexity of cost control because the relationship between production volume and specific products and their product costs is less obvious.

c. Production volume is no longer as significant a cost driver as it was two decades ago. The growth in both fixed costs and indirect costs suggests that production volume cannot be used as an effective control for a substantial set of production-related costs. However, production volume may still be a valid predictor because it may be reasonably well correlated with the actual cost drivers of these indirect costs and it is still the most significant cost driver for direct production costs.

P2-43.

a. To remain competitive in the global marketplace, businesses must control costs. Provision of health care is creating a crisis for American businesses. In many cases, health-care costs are twice as high for U.S. industries as for their foreign competitors. There is nothing unethical about businesses being concerned about these costs and seeking ways to control them. However, before cutting coverage, businesses have an ethical obligation to identify alternatives. For example, emerging alternatives include managed health care, sharing insurance premiums with employees, and forming alliances with other businesses to directly contract for health-care services. Businesses should be careful to gather employee input on solutions before making any decisions that will adversely affect health-care coverage.

b. There are no correct or incorrect answers to this question. It is expected that each student will have a relatively unique ranking of the alternatives. This subpart is intended to demonstrate to the students how difficult it is to cut health-care insurance coverage because each worker has different needs and different priorities.

c. By bringing some health-care services in-house, a firm can replace a portion of the variable costs (per employee) with fixed costs. A company may be able to achieve similar benefits by directly contracting with health-care service providers on a (partly) fixed-fee basis. Likewise, companies can implement health awareness campaigns and provide fitness facilities that will generate long-term health benefits and lower health-care costs. Such approaches will result in an increase in fixed costs and lower variable costs.

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P2-44.

a.

(1)	Work in Process Inventory	800,000	
	Raw Material Inventory		800,000
	To issue direct material to production		
(2)	Work in Process Inventory	720,000	
	Cash (40,000 × $18)		720,000
	To pay direct labor payroll		
(3)	Manufacturing Overhead Control	232,500	
	Wages Payable (15,500 × $15)		232,500
	To accrue indirect labor costs		
(4)	Manufacturing Overhead Control	102,100	
	Accumulated Depreciation		102,100
	To depreciate factory assets		
(5)	Manufacturing Overhead Control	32,800	
	Salaries Payable		32,800
	To accrue supervisors' salaries		
(6)	Manufacturing Overhead Control	25,400	
	Supplies Inventory		25,400
	To issue indirect material to production		
(7)	Finished Goods Inventory	1,749,300	
	Work in Process Inventory		1,749,300
	To transfer completed work to FG		

b.

Beginning balance of WIP	$ 18,900
Direct material	800,000
Direct labor	720,000
Manufacturing overhead for January *(plug)*	270,000
Cost to account for	$ 1,808,900
Goods completed	(1,749,300)
Ending balance of WIP	$ 59,600

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P2-45.

a. Direct labor is labor that can be specifically identified with, or physically traced to, a cost object or finished product in an economically feasible manner (such as machine operator labor in a production environment). Indirect labor is all factory labor that is not classified as direct labor.

b. Certain nonproductive time may be a normal and unavoidable part of total labor time. In such cases, a pro rata share of nonproductive time should be classified as direct labor time. In many cases, nonproductive time is classified as indirect labor because it cannot be identified with a cost object. For example, the amount of downtime usually cannot be identified with a specific cause or particular cost object; it may result from a parts shortage or a broken machine. When there is a shortage of work and employees would therefore be idle, this time can be used for training.

c. *Direct labor:* The items classified as direct labor can usually be specifically identified with a quantity of labor. Furthermore, other direct costs, such as payroll taxes, are incurred by the organization because of its use of labor.

   Manufacturing overhead: The items classified as manufacturing overhead usually cannot be specifically identified with direct labor quantities.

   Direct labor or manufacturing overhead: Some cost items can be classified as either direct labor or manufacturing overhead, depending on the size of the cost object. For example, for very large projects, employee time can be easily associated with the projects (such as the time of specific managers, engineers, draftspersons, janitors, and material handlers). Therefore, all costs associated with these employees can be classified as direct labor costs. For smaller cost objects, such as a variety of products or subassemblies, costs are more difficult to identify with the cost objects and therefore are classified as manufacturing overhead.

d. The quantity of labor hours that should be included as direct labor or manufacturing overhead reflects a measure of activity. The activity that was performed was either directly related to the product or indirectly related (or not easily traceable) to the product. The dollar amount assigned measures the cost of the activity. Wages and salaries are not necessarily directly tied to production activity. For example, assume a direct labor employee makes $10 per hour and time-and-a-half for overtime. This employee's activity is no different during the overtime hours—only the wage rate differs. Thus, measurement of activity and measurement of cost must be separated.

P2-46.

a. Overhead costs are the easiest to assign to other classifications since those costs are not directly related to the production of the goods.

b. Each student will have a different answer, but the following should be considered: the reason for the bank's loan-granting criteria; the effect on the company's suppliers, employees, and customers should this loan not be granted; the ability to manipulate financial income; and the inappropriate "tone at the top" that the president is suggesting.

c. The memo should contain information as to the nature of costs and the fact that the "cost" of a product can, in many instances, have many different meanings. It should indicate the need for the loan, the ability to provide collateral (if any), and information as to payback. The memo should indicate that the "bottom line" is in excess of the bank's criteria and how this fact could influence the ability to repay. Cash flow from product sales should also be discussed because, without cash flow, income cannot pay back loan amounts.

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P2-47.

a. If GP rate is 35 percent of sales, then CGS is 65 percent of sales.
CGS = 0.65 × $1,431,000 = $930,150

b.

Direct material used		$ 447,000
Direct labor		322,500
Overhead:		
Indirect labor	$ 93,000	
Factory insurance	3,000	
Factory utilities	21,450	
Factory depreciation	32,550	
Factory rent	126,000	276,000
Total costs to account for		$1,045,500
Ending WIP inventory		(15,750)
Cost of goods manufactured		$1,029,750

c. Ending FG inventory = Beginning FG inventory + CGM – CGS
= $0 + $1,029,750 – $930,150
= $99,600

d. Gross profit = 0.35 × $1,431,000 = $500,850

S&A expenses = Gross profit – Net income
= $500,850 – $125,000
= $375,850

e.

Raw Material Inventory	555,000	
Accounts Payable		555,000
To purchase direct material on account		
Work in Process Inventory	447,000	
Raw Material Inventory		447,000
To issue direct material to production		
Work in Process Inventory	322,500	
Wages Payable		322,500
To accrue direct labor payroll		
Manufacturing Overhead Control	93,000	
Wages Payable		93,000
To accrue indirect payroll		
Manufacturing Overhead Control	3,000	
Prepaid Insurance		3,000
To record expiration of prepaid insurance on factory		

continued

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e. continued

Manufacturing Overhead Control	21,450	
Cash		21,450
To pay factory utilities		
Manufacturing Overhead Control	32,550	
Accumulated Depreciation		32,550
To record depreciation on factory equipment		
Manufacturing Overhead Control	126,000	
Cash		126,000
To pay factory rent		
Work in Process Inventory	276,000	
Manufacturing Overhead Control		276,000
To assign actual overhead to WIP [see (b)]		
Finished Goods Inventory	1,029,750	
Work in Process Inventory		1,029,750
To transfer completed goods to FG [see (b)]		
S&A Expenses	375,850	
Accounts Payable (or Cash)		375,850
To record S&A expense [see (c)]		
Cost of Goods Sold	930,150	
Finished Goods Inventory		930,150
To record cost of goods sold [see (a)]		
Accounts Receivable	1,431,000	
Sales		1,431,000
To record sales on account		

P2-48.

a. Number of units sold = 648,000 ÷ $24 = 27,000

Number of units completed = Units in FG inventory + Units sold
= 3,000 + 27,000
= 30,000

b.

Direct material used		$186,000
Direct labor		134,000
Overhead:		
Factory rent	$ 3,600	
Factory utilities	16,200	
Factory depreciation	15,800	
Supervisor salary	6,400	42,000
Total costs to account for		$362,000
Ending WIP inventory		(35,000)
Cost of goods manufactured		$327,000

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c. $327,000 ÷ 30,000 = $10.90 per unit

d.

Raw Material Inventory	248,000	
Accounts Payable		248,000
To purchase direct material on account		
Work in Process Inventory	186,000	
Raw Material Inventory		186,000
To issue direct material to production		
Work in Process Inventory	134,000	
Wages Payable		134,000
To accrue direct labor payroll		
Manufacturing Overhead Control	3,600	
Cash		3,600
To pay factory rent		
Manufacturing Overhead Control	16,200	
Utilities Payable		16,200
To accrue factory utilities		
Manufacturing Overhead Control	15,800	
Accumulated Depreciation		15,800
To record depreciation on factory equipment		
Manufacturing Overhead Control	6,400	
Cash		6,400
To pay supervisor's salary		
Work in Process Inventory	42,000	
Manufacturing Overhead Control		42,000
To assign actual overhead to WIP [see (b)]		
Finished Goods Inventory	327,000	
Work in Process Inventory		327,000
To transfer completed goods to FG [see (b)]		
Cost of Goods Sold	294,300	
Finished Goods Inventory		294,300
To record cost of goods sold ($10.90 × 27,000)		
Accounts Receivable	648,000	
Sales		648,000
To record sales on account ($24 × 27,000)		

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P2-49.

	Case 1	Case 2	Case 3
Sales	$9,300	$19,700[g]	$112,000
Direct material used	1,200	6,100[h]	18,200
Direct labor	2,500[a]	4,900	32,100[m]
Prime cost	3,700	11,000[i]	50,300[n]
Conversion cost	4,800	8,200	49,300
Manufacturing overhead	2,300[b]	3,300[j]	17,200
Cost of goods manufactured	6,200	14,000	68,900[o]
Beginning WIP inventory	500	900	5,600
Ending WIP inventory	300[c]	1,200	4,200
Beginning FG inventory	800[d]	1,900	7,600
Ending FG inventory	1,200	3,700[k]	4,300[p]
Cost of goods sold	5,800[e]	12,200	72,200
Gross profit	3,500	7,500[l]	39,800[q]
Operating expenses	1,300[f]	3,500	18,000
Net income	2,200	4,000	21,800[r]

[a] Prime cost = DM + DL
$3,700 = $1,200 + X; X = $2,500

[b] Conversion cost = DL + OH
$4,800 = $2,500 + X; X = $2,300

[c] Beg. WIP + DM + DL + OH – CGM = End. WIP
$500 + $1,200 + $2,500 + $2,300 – $6,200 = X; X = $300

[e] Sales – Gross profit = CGS
$9,300 – $3,500 = X; X = $5,800

[d] Beg. FG + CGM – End. FG = CGS
X + $6,200 – $1,200 = $5,800; X = $800

[f] Gross profit – Operating expenses = NI
$3,500 – X = $2,200; X = $1,300

[g] Sales – CGS – Operating expenses = NI
X – $12,200 – $3,500 = $4,000; X = $19,700

[h] CGM = Beg. WIP + DM + DL + OH – End. WIP
$14,000 = $900 + X + $4,900 + $3,300 – $1,200; X = $6,100

[i] Prime cost = DM + DL
X = $6,100 + $4,900; X = $11,000

[j] Conversion cost = DL + OH
$8,200 = $4,900 + X; X = $3,300

[k] Beg. FG + CGM – End. FG = CGS
$1,900 + $14,000 – X = $12,200; X = $3,700

[l] Sales – CGS = Gross profit
$19,700 – $12,200 = X; X = $7,500

[m] Conversion cost = DL + OH
$49,300 = X + $17,200; X = $32,100

[n] Prime cost = DM + DL
X = $32,100 + $18,200; X = $50,300

[o] CGM = Beg. WIP + DM + DL + OH – End. WIP
X = $5,600 + $32,100 + $18,200 + $17,200 – $4,200;
X = $68,900

[p] Beg. FG + CGM – End. FG = CGS
$7,600 + $68,900 – X = $72,200; X = $4,300

[q] Sales – CGS = Gross profit
$112,000 – $72,200 = X; X = $39,800

[r] Gross profit – Operating expenses = NI
$39,800 – $18,000 = X; X = $21,800

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P2-50.

a. Under GAAP, product cost consists of all amounts that are necessary to manufacture a product. Although direct material and direct labor are clearly traceable to a product and thus should be considered part of product cost, a product could also not be produced without the costs of overhead. In a manufacturing plant, employees need to have some level of supervision and perform some cleanup tasks. Glue, screws, and nails are commonly used to secure parts together. Equipment and utilities must be used. Thus, indirect labor, indirect material, depreciation, and electricity are required to manufacture a product and should be part of that product's cost.

b. It does not seem reasonable to allocate the depreciation overhead cost of the new equipment to the dog carriers because that equipment is not required for the production of the carriers. For this reason, overhead costs should be separated into different allocation "pools" and allocated to the two product groups based on the cost drivers associated with each allocation pool. This concept is explained in more detail in Chapter 4.

c. A normal cost system uses a predetermined charge for overhead rather than using the actual amounts that are incurred. One primary component of overhead is utility cost. In Michigan, the utility cost for winter operations could be substantially greater than during the summer. In Hawaii, the climate is consistent year-round, and thus, utility costs should be fairly constant. Because of the large fluctuations in utility costs, a Michigan business might be more likely to want to "smooth" that part of overhead throughout the year by using a predetermined overhead rate.

P2-51.

a.

Beginning inventory of direct material	$ 12,300
Direct material purchased	196,300
Materials available for use	$208,600
Ending inventory of direct material	X
Direct material used	$195,800

X= $208,600 – $195,800
X = $12,800

b.

Direct material used	$195,800
Direct labor	182,400
Factory overhead	205,700
Total product costs	$583,900

c.

Petersham Company
Schedule of Cost of Goods Manufactured
For the Month Ended August 31

Beginning WIP inventory	$ 25,900
Direct material used	195,800
Direct labor	182,400
Overhead	205,700
Total costs to account for	$609,800
Ending WIP inventory	(33,300)
Cost of goods manufactured	$576,500

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d.

Petersham Company Cost of Goods Sold Schedule For the Month Ended August 31	
Beginning FG inventory	$ 62,700
Cost of goods manufactured	576,500
Goods available for sale	$639,200
Ending FG inventory	(55,500)
Cost of goods sold	$583,700

e.

Petersham Company Income Statement For the Month Ended August 31	
Sales	$ 985,000
Cost of goods sold	(583,700)
Gross profit	$ 401,300
Selling and administrative expenses	(171,200)
Income before income taxes	$ 230,100
Income tax expense ($230,100 × 0.40)	(92,040)
Net income	$ 138,060

P2-52.

a. $1,040,000 ÷ $5,200 = 200 units sold

b.

Flex-Em Schedule of Cost of Goods Manufactured For the Month Ended July 31			
Beginning WIP inventory			$ 0
Direct material used		$377,000	
Direct labor		126,800	
Overhead:			
Indirect labor	$ 40,600		
Insurance	6,000		
Utilities	17,800		
Depreciation	230,300	294,700	798,500
Total manufacturing costs			$798,500
Ending WIP inventory			(51,000)
Cost of goods manufactured			$747,500

c. Units completed = Units sold + Units in ending FG inventory
= 200 + ($97,500 ÷ $3,250)
= 200 + 30
= 230 units completed

d. $747,500 ÷ 230 units = $3,250

e. 200 × $3,250 = $650,000

f. Sales – CGS = Gross margin
$1,040,000 – $650,000 = $390,000

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P2-53.

a. and b.

Raw Material Inventory			
BB	72,000	136,200	(2) DM and IM issued
(1) Purch.	570,000		
EB	505,800		

Work in Process Inventory			
BB	108,000	532,140	CGM
(2) DM	121,200		
(2) IM	15,000		
(3) DL	180,000		
(3) IL	42,000		
(5) Util.	28,140		
(6) Depr.	48,000		
(7) Rent	39,600		
EB	49,800		

Finished Goods Inventory			
BB	24,000	502,740	CGS
EB	53,400		

Total product cost = Cost of goods manufactured = $532,140

Period costs for August (all on income statement):

Office salaries expense (4)	$144,600
Utilities expense (5)	12,060
Depreciation expense (6)	12,000
Rent expense (7)	26,400
Total period cost	$195,060

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P2-54.

a. Cost of goods sold for the first 18 days of June: $230,000 × (1 – 0.40) = $138,000

Cost of goods sold for the first 18 days of June:

Beginning FG inventory	$ 29,000
Cost of goods manufactured	151,500[b]
Goods available for sale	$180,500[a]
Ending FG inventory	(42,500)
Cost of goods sold	$138,000

[a] CGA = $138,000 + $42,500 = $180,500
[b] CGM = $180,500 – $29,000 = $151,500

Cost of goods manufactured for the first 18 days of June:

Beginning WIP inventory	$ 48,000
Direct material used	76,000
Direct labor	44,000
Manufacturing overhead	42,000
Total cost to account for	$210,000
Ending WIP inventory	(58,500)[c]
Cost of goods manufactured	$151,500

[c] Ending WIP Inventory = $210,000 – $151,500 = $58,500

b. The insurance company would want to substantiate the quantity and cost of the inventory. The company would require nonfinancial records including labor, material, and production. The insurance company might also require some verification of the market value (current value or replacement value) of the inventory. Further, it might require the company to substantiate the number of units in the WIP inventory and the average percentage of completion. The market value data could be obtained from industry publications and the unit data might be obtained from production records or internal receiving and shipping documents.

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