

Managerial and Cost Accounting Exercises I

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Problem 1

Armor World manufacturers armored cars. The armor provides low level ballistics protection. Cars are made to customer specifications via orders submitted over an internet site. The cars are completed and shipped in about one day. As a result, Armor World does not maintain any work in process or finished goods inventory. The following costs were incurred in producing and selling mats during July:

Steel used in the armoring	\$67,150
Armor grade glass for windows	7,000
Factory rent	4,800
Electricity to run the welding equipment	1,300
Labor cost of welders	17,050
Internet sales site	750
Administrative salaries	6,250
Depreciation of welding equipment	3,700
Salary of factory safety inspector	1,750
Office rent	6,750

Evaluate these costs, and determine the amount of direct material, direct labor, factory overhead, and selling/general/administrative costs. Next, identify how much is considered to be a “prime cost” and how much is considered to be a “conversion cost.”

Worksheet 1

	<u>Total</u> <u>Cost</u>	<u>Direct</u> <u>Material</u>	<u>Direct</u> <u>Labor</u>	<u>Factory</u> <u>Overhead</u>	<u>SG&A</u>
Steel used in the armoring	\$ 67,150	\$ -	\$ -	\$ -	\$ -
Armor grade glass for windows	7,000	-	-	-	-
Factory rent	4,800	-	-	-	-
Electricity to run the welding equipment	1,300	-	-	-	-
Labor cost of welders	17,050	-	-	-	-
Internet sales site	750	-	-	-	-
Administrative salaries	6,250	-	-	-	-
Depreciation of welding equipment	3,700	-	-	-	-
Salary of factory safety inspector	1,750	-	-	-	-
Office rent	6,750	-	-	-	-
	<u>\$ 116,500</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>

Solution 1

	<u>Total Cost</u>	<u>Direct Material</u>	<u>Direct Labor</u>	<u>Factory Overhead</u>	<u>SG&A</u>
Steel used in the armoring	\$ 67,150	\$ 67,150			
Armor grade glass for windows	7,000	7,000			
Factory rent	4,800	-		\$ 4,800	
Electricity to run the welding equipment	1,300	-		1,300	
Labor cost of welders	17,050	-	\$ 17,050	-	
Internet sales site	750	-	-	-	\$ 750
Administrative salaries	6,250	-	-	-	6,250
Depreciation of welding equipment	3,700	-	-	3,700	-
Salary of factory safety inspector	1,750	-	-	1,750	-
Office rent	6,750	-	-	-	6,750
	<u>\$ 116,500</u>	<u>\$ 74,150</u>	<u>\$ 17,050</u>	<u>\$ 11,550</u>	<u>\$ 13,750</u>

The prime costs are \$91,200, consisting of direct labor and direct materials (\$74,150 + \$17,050). The conversion costs are \$35,600, consisting of direct labor and factory overhead (\$17,050 + \$18,550).

Problem 2

Deerbound Manufacturing transferred \$3,000,000 of raw materials into production during the most recent year. Direct labor and factory overhead for the period totaled \$2,000,000. Beginning work in process was \$670,000 and ending work in process was \$850,000. Finished goods inventory decreased by \$50,000. If gross profit was \$1,000,000, how much was sales for the period?

Solution 2

Total manufacturing costs were \$5,000,000 (\$3,000,000 + \$2,000,000). Of this total cost entering production, \$4,820,000 was transferred to finished goods (the other \$180,000 remained in work in process (\$850,000 - \$670,000)).

Given that finished goods inventory decreased, the total cost of goods sold was \$4,870,000 (\$4,820,000 transferred into finished goods + \$50,000 decrease in finished goods).

Total sales equaled \$5,870,000 (\$4,870,000 cost of goods sold + \$1,000,000 gross profit).



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Problem 3

Bubble Bobber provided the following list of cost data related to its manufacturing operations for the month of October 20X5.

Beginning raw materials inventory	\$ 2,416,000
Raw materials purchased (net)	5,863,750
Ending raw materials inventory	2,045,500
Direct labor costs	805,750
Indirect materials	313,750
Indirect labor	222,250
Factory utilities and maintenance	1,140,000
Factory depreciation	141,500
Other factory related overhead	61,000
Beginning work in process	1,942,500
Ending work in process	1,792,500

- Arrange the cost data into a statement of cost of goods manufactured.
- If Bubble Bobber's cost of goods sold for the month was \$10,000,000, how much was the increase or decrease in finished goods inventory for the month of October?

Solution 3

a)

BUBBLE BOBBER CORPORATION			
SCHEDULE OF COST OF GOODS MANUFACTURED			
For the month ending October 31, 20X5			
Direct materials:			
Beginning raw materials inventory, Oct. 1	\$	2,416,000	
Plus: Net purchases of raw materials		5,863,750	
Raw materials available	\$	8,279,750	
Less: Ending raw materials inventory, Oct. 31		2,045,500	
Raw materials transferred to production			\$ 6,234,250
Direct labor			805,750
Factory overhead			
Indirect materials	\$	313,750	
Indirect labor		222,250	
Factory utilities and maintenance		1,140,000	
Factory depreciation		141,500	
Other factory related overhead		61,000	
			1,878,500
Total manufacturing costs	\$		8,918,500
Add: Beginning work in process inventory, Oct. 1			1,942,500
			\$ 10,861,000
Less: Ending work in process, Oct. 31			1,792,500
Cost of goods manufactured	\$		<u>9,068,500</u>

b) Bubble Bobber's finished goods inventory decreased by \$931,500 (\$10,000,000 - \$9,068,500). It is important for students to sense that less cost was transferred into finished goods (the cost of goods manufactured/\$9,068,500) than was transferred out of finished goods (the cost of goods sold/\$10,000,000).

Problem 4

Brain-Tech was newly formed early in 20X9. The following information relates to the full year:

Raw materials purchased (net)	\$10,500,000
Direct labor costs	7,000,000
Factory overhead	5,250,000
Selling, general & administrative	2,450,000

75% of the available raw material was transferred into production.

60% of the work in process was completed.

80% of the finished goods were sold.

15% of factory overhead related to depreciation.

25% of SG&A related to depreciation.

- a) How much is in ending inventory for (1) raw materials, (2) work in process, and (3) finished goods?
- b) How much is in (1) cost of goods sold and (2) SG&A expense for the period?
- c) How much of the total depreciation for the period is charged against income during the period?

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Worksheet 4

a1)

a2)

a3)

b1)

b2)

c)

Solution 4

- a1) 25% of the raw materials purchases remain in ending raw materials inventory. ($25\% \times \$10,500,000 = \$2,625,000$).
- a2) The total amount placed into process was \$20,125,000 ($(\$10,500,000 \times 75\%) + \$7,000,000 + \$5,250,000$). Of this amount, 40% remains in work in process inventory ($\$20,125,000 \times 40\% = \$8,050,000$).
- a3) The amount transferred to finished goods from work in process was \$12,075,000 ($\$20,125,000 \times 60\%$). Of this amount, 20% remains in finished goods inventory ($\$12,075,000 \times 20\% = \$2,415,000$).
- b1) The amount transferred to finished goods from work in process was \$12,075,000 ($\$20,125,000 \times 60\%$). Of this amount, 80% was allocated to cost of goods sold ($\$12,075,000 \times 80\% = \$9,660,000$).
- b2) The SG&A is a period cost, and is entirely charged against income during the year (\$2,450,000).
- c) The total depreciation is \$1,400,000 ($(\$5,250,000 \times 15\%) + (\$2,450,000 \times 25\%)$). Of this amount, \$378,000 ($\$5,250,000 \times 15\% \times 60\%$ transferred to finished goods $\times 80\%$ sold) is charged against income. The remaining amount is allocated to work in process and finished goods inventory.

Problem 5

Old World Furniture constructs and sells executive style conference tables. The selling price is \$15,000 per table. A unique feature is that the only raw material used in the construction of each table, other than indirect materials like glues and screws, comes entirely from a single tree. Tree prices and other costs of production have remained stable, and Old World is able to use each tree purchased without incurring any significant spoilage. Consider the following “disorganized” information and complete the indicated requirements.

Ending work in process (900 tables)	\$ 2,700,000
Selling price per table	15,000
Ending finished goods (300 tables)	2,100,000
Indirect labor incurred during the period	187,500
Raw materials transferred into production (1,050 trees)	1,050,000
Beginning finished goods (600 tables)	4,200,000
Cost of glues and screws	52,500
Beginning work in process	2,197,500
Ending raw materials (750 trees)	750,000
Direct labor incurred during the period	4,950,000
Selling, general, and administrative costs incurred	1,725,000
Depreciation of factory equipment	112,500
Raw material purchases during the period (1,350 trees)	1,350,000
All other factory overhead	450,000
Tables sold (1,200 tables)	

- Complete the reconciliation of units on the accompanying blank worksheet, showing the “unit” activity in raw materials, work in process, and finished goods.
- Calculate the cost of goods manufactured.
- Calculate the cost of goods sold.
- Calculate net income. Assume an income tax rate of 30%.

Worksheet 5

a)

	<u>Raw Materials</u>	<u>Work in Process</u>	<u>Finished Goods</u>
Beginning balance			
Purchases/transfers in			
Transfers out/sales			
Ending balance			

b)

c)

d)

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Solution 5

a)

	<u>Raw Materials</u>	<u>Work in Process</u>	<u>Finished Goods</u>
Beginning balance	450	750	600
Purchases/transfers in	1350	1050	900
Transfers out/sales	(1050)	<i>(900)</i>	(1200)
Ending balance	<u>750</u>	<u>900</u>	<u>300</u>

The **bold** values are given within the problem, and the italicized amounts are “solved.” Because costs are stable in this problem (e.g., \$1,000 per tree), the choice of inventory method (FIFO, average, etc.) does not come into play. In addition, note the 1:1 correspondence between raw material and finished goods. Point out to your students that subsequent chapters will build upon these basic concepts to reflect alternative inventory methods and multiple raw material inputs. Point out that the “per unit” cost assigned to beginning and ending work in process may vary depending upon the stage of completion of production.

b)

Beginning raw materials (\$1,000 per table)		\$450,000
Plus: Net purchases of raw materials		1,350,000
Raw materials available	\$	1,800,000
Less: Ending raw materials		750,000
Raw materials transferred to production	\$	1,050,000
Direct labor		4,950,000
Factory overhead		
Indirect materials	\$52,500	
Indirect labor	187,500	
Factory depreciation	112,500	
Other factory related overhead	450,000	802,500
Total manufacturing costs	\$	6,802,500
Add: Beginning work in process		2,197,500
	\$	9,000,000
Less: Ending work in process		2,700,000
Cost of goods manufactured	\$	<u>6,300,000</u>

c)

Beginning finished goods inventory	\$	4,200,000
Plus: Cost of goods manufactured		6,300,000
Goods available for sale	\$	10,500,000
Less: Ending finished goods inventory		2,100,000
Cost of goods sold	\$	<u>8,400,000</u>

d)

Sales (1,200 @ \$15,000)	\$ 18,000,000
Cost of goods sold	<u>8,400,000</u>
Gross profit	\$ 9,600,000
Selling, general, & administrative costs	<u>1,725,000</u>
Income before tax	\$ 7,875,000
Income tax expense (30%)	<u>2,362,500</u>
Net income	<u><u>\$ 5,512,500</u></u>

Problem 6

Herrmann Corporation is a manufacturer of saw blades. The blades are sold to machine and equipment dealers, and marketing is handled via a network of regionalized manufacturer representatives. The only selling expenses pertain to commissions paid to the manufacturer representatives. The commissions are 6% of total sales. The following information pertains to operations during the calendar year 20X8.

Sales	\$ 8,645,661
Administrative salaries	525,654
Direct labor	2,039,804
Indirect labor	739,233
Total depreciation	186,180
Total utilities	156,000
Interest expense	40,500
Other factory overhead	46,472

Of the total depreciation, 80% relates to manufacturing and 20% relates to general and administrative costs. Of the total utilities, 70% relates to manufacturing and 30% relates to general and administrative costs.

Income taxes are 30% of income before taxes.

Following is information about various inventory components:

	<u>Raw Materials</u>	<u>Indirect Materials</u>	<u>Work in Process</u>	<u>Finished Goods</u>
Beginning balance	\$ 465,054	\$ 33,048	\$ 728,206	\$ 745,598
Purchases	2,600,799	192,300	n/a	n/a
Ending balance	487,399	43,029	566,442	932,105

- Use the above information to construct a schedule of cost of goods manufactured for the year ending December 31, 20X8.
- Use the above information to construct a schedule of cost of goods sold for the year ending December 31, 20X8.
- Use the above information to construct an income statement for the year ending December 31, 20X8.

Worksheet 6

a)

HERRMANN CORPORATION SCHEDULE OF COST OF GOODS MANUFACTURED For the Year Ending December 31, 20X8	
	<hr style="border: 0; border-top: 1px solid black; margin-bottom: 10px;"/> <hr style="border: 0; border-top: 1px solid black; margin-bottom: 10px;"/> <hr style="border: 0; border-top: 1px solid black; margin-bottom: 10px;"/> <hr style="border: 0; border-top: 1px solid black; margin-bottom: 10px;"/>


b)

HERRMANN CORPORATION SCHEDULE OF COST OF GOODS SOLD For the Year Ending December 31, 20X8	
Beginning finished goods inventory, Jan. 1	\$ -
Plus: Cost of goods manufactured	-
Goods available for sale	\$ -
Less: Ending finished goods inventory, Dec. 31	-
Cost of goods sold	\$ -

c)


HERRMANN CORPORATION			
Income Statement			
For the Year Ending December 31, 20X8			
Sales		\$	-
Cost of goods sold			-
Gross profit		\$	-
Operating Expenses			
Selling	\$	-	-
General & administrative*		-	-
Interest expense		-	-
Income before income taxes		\$	-
Income taxes			-
Net income		\$	-

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Solution 6

a)

HERRMANN CORPORATION			
SCHEDULE OF COST OF GOODS MANUFACTURED			
For the Year Ending December 31, 20X8			
Direct materials:			
Beginning raw materials inventory, Jan. 1	\$	465,054	
Plus: Net purchases of raw materials		2,600,799	
Raw materials available	\$	3,065,853	
Less: Ending raw materials inventory, Dec. 31		487,399	
Raw materials transferred to production			\$ 2,578,454
Direct labor			2,039,804
Factory overhead			
Indirect materials (\$33,048 + \$192,300 - \$43,029)	\$	268,377	
Indirect labor		739,233	
Factory utilities (\$156,000 X 70%)		109,200	
Factory depreciation (\$186,180 X 80%)		148,944	
Other factory overhead		46,472	
			1,312,226
Total manufacturing costs			\$ 5,930,484
Add: Beginning work in process inventory, Jan. 1			728,206
			\$ 6,658,690
Less: Ending work in process, Dec. 31			566,442
Cost of goods manufactured			<u>\$ 6,092,248</u>

b)

HERRMANN CORPORATION			
SCHEDULE OF COST OF GOODS SOLD			
For the Year Ending December 31, 20X8			
Beginning finished goods inventory, Jan. 1	\$	745,598	
Plus: Cost of goods manufactured		6,092,248	
Goods available for sale	\$	6,837,846	
Less: Ending finished goods inventory, Dec. 31		932,105	
Cost of goods sold	\$	<u>5,905,741</u>	

c)

HERRMANN CORPORATION			
Income Statement			
For the Year Ending December 31, 20X8			
Sales		\$	8,645,661
Cost of goods sold			5,905,741
Gross profit		\$	2,739,920
Operating Expenses			
Selling	\$	518,740	
General & administrative*		609,690	
Interest expense		40,500	1,168,930
Income before income taxes		\$	1,570,990
Income taxes			471,297
Net income		\$	1,099,693

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