

Cost Systems

Terms

Cost Accounting
 Process Cost System
 Job Order Cost System

Job-Order Costing	Process Costing
Used for custom or unique items Each job is accounted for separately Measures cost based on completed job Examples: Movie, Plane, Custom house	Used for large volumes of similar products Production is continuous Measures costs based on a period of time Examples: cereal, chips, paper towels,

Example #1

A list of common manufacturing companies follows.

- a) Cruise ship builder
- b) Cornflakes factory
- c) Law firm
- d) Dentists office
- e) Beverage bottling company

Required: Determine whether job order costing or process costing would be more appropriate for each industry.

Solution #1

- a) Job-order costing (every ship is a separate job)
- b) Process costing
- c) Job-order costing (every case is a separate job)
- d) Job-order costing (every patient visit is a separate job)
- e) Process costing

Cost Flow

- The journal entries to record the flow of costs through the inventory accounts are:

Purchase of raw materials

Raw material inventory	xxx	
Accounts payable		xxx

Issue raw materials

Work-in-process inventory (direct)	xxx	
Manufacturing overhead (indirect)	xxx	
Raw materials inventory		xxx

Labor costs incurred

Work-in-process inventory (direct)	xxx	
Manufacturing overhead (indirect)	xxx	
Wages and salaries payable		xxx

Manufacturing overhead costs incurred

Manufacturing overhead	xxx	
Accounts payable or cash		xxx

Manufacturing overhead	xxx	
Accumulated depreciation		xxx

Manufacturing overhead	xxx	
Prepaid expenses		xxx

Manufacturing overhead	xxx	
Accrued expenses		xxx

Flow of Costs Through Inventory Accounts

Raw Materials		Work in Process		Finished Goods		Cost of Goods Sold	
Beginning Balance		Beginning Balance		Beginning Balance		Beginning Balance	
	- DM Used	+DM Used					
+Purchases		+DL Used	- COGM	+COGM	- COGS	+COGS	
		+MOH Applied					
=Ending Balance		=Ending Balance		=Ending Balance		=Ending Balance	

Manufacturing Overhead	
Beginning Balance	
+Actual overhead costs incurred	-MOH applied
=Under-applied	= Over-applied

- Actual overhead costs incurred flow through the Manufacturing Overhead account into the work-in-process inventory as overhead applied.
- Some companies may use departmental predetermined overhead rates rather than the single plant-wide predetermined overhead rate shown here in an effort to make the overhead application process more accurate.

Manufacturing overhead applied

Work-in-process inventory	xxx	
Manufacturing overhead		xxx

Goods are completed

Finished goods inventory	xxx	
Work-in-process inventory		xxx

Finished goods are sold

Cash or accounts receivable	xxx	
Sales		xxx
Cost of goods sold	Xxx	
Finished goods inventory		xxx

Close balance in overhead account

- Underapplied

Cost of goods sold	xxx	
Manufacturing overhead		xxx

OR

- Overapplied

Manufacturing overhead	xxx	
Cost of goods sold		xxx

Example #2

C Company uses job-order costing. It applies overhead cost to jobs on the basis of direct labor-hours. The following transactions took place during the year:

- a) \$300,000 of raw materials were purchased on account
- b) Raw materials were issued into production: \$90,000 direct materials and \$40,000 indirect materials
- c) Labor costs incurred: \$40,000 direct, \$130,000 indirect, sales commissions \$50,000, administrative salaries \$100,000
- d) Utility costs for the factory were \$60,000
- e) Depreciation recorded was \$300,000 (70% related to factory; 30% related to administrative offices)
- f) Manufacturing overhead of \$715,000 was applied to production. Actual direct labor-hours incurred were 22,000.
- g) Jobs costing \$300,000 were completed and transferred into the finished goods inventory.
- h) Jobs with a cost of \$150,000 were sold on account for \$200,000.
- i) Closed the under/overapplied overhead for the year.

Required: Prepare the necessary journal entries

Solution #2

a)	Raw materials	300,000	
	Accounts payable		300,000
b)	Work in process	90,000	
	Manufacturing overhead	40,000	
	Raw materials		130,000
c)	Work in process	40,000	
	Manufacturing overhead	130,000	
	Sales commission expense	50,000	
	Administrative salaries expense	100,000	
	Salaries and wage payable		320,000
d)	Manufacturing overhead	60,000	
	Accounts payable		60,000
e)	Manufacturing overhead	210,000	
	Depreciation expense	90,000	
	Accumulated depreciation		300,000
f)	Work in process	715,000	
	Manufacturing overhead (1)		715,000
g)	Finished goods	300,000	
	Work in process		300,000
h)	Accounts receivable	200,000	
	Sales		200,000
	Cost of goods sold	150,000	
	Finished goods		150,000
i)	Manufacturing overhead	275,000	
	Cost of goods sold		275,000

(1)

Manufacturing Overhead	
actual	applied
40,000	
130,000	715,000
60,000	
210,000	
<hr/>	
	275,000 overapplied

Practice Problems

Practice Problem #1

Z Company makes custom motorboats. It incurred the following costs for the just-completed job B011. 500 pounds of direct materials were used at a cost per pound of \$25. The job cost sheet indicates that a total of 90 direct labor-hours incurred on job B011. The workers were paid at a rate of \$18 per hour. The company applies overhead based on machine hours. At the beginning of the year, it was estimated that the total amount of overhead would be \$180,000 and a total of 30,000 machine hours would be incurred. Job B011 required 150 machine hours.

Required: Determine the total cost assigned to Job B011

Practice Problem #2

T Company had 3 cookie orders in production at June 30: chocolate chip, oatmeal raisin and peanut butter. Material costs for chocolate chip and peanut butter were \$500 and \$350. Direct labor costs per batch were \$200 and \$250 for chocolate chip and oatmeal raisin, respectively and \$600 in total. Overhead is applied at the rate of 50% of direct materials costs. Total costs for the oatmeal raisin batch were \$1,150.

Required: What was the balance in work-in-process at June 30?

Practice Problem #3

B Company, which began operations on January 1 of the current year, reported the following information:

Estimated manufacturing overhead	\$600,000
Actual manufacturing overhead	639,000
Estimated direct labor cost	480,000
Actual direct labor cost	500,000
Total debits in the Work-In-Process account	1,880,000
Total credits in the Finished Goods account	920,000

B Company uses a normal cost system and applies manufacturing overhead to jobs on the basis of direct labor cost. A 60% markup is added to the cost of completed production when finished goods are sold. On December 31, job no. 18 was the only job that remained in production. That job had direct-material and direct-labor charges of \$16,500 and \$36,000, respectively.

- Required:
- Determine the company's predetermined overhead rate.
 - Determine the amount of under- or overapplied overhead.
 - Compute the amount of direct materials used in production.
 - Calculate the balance the company would report as ending work-in-process inventory.
 - Prepare the journal entries needed to record B Company's sales, which are all made on account.

Practice Problem #4

S Company, which uses a job-costing system, began business on January 1, and applies manufacturing overhead on the basis of direct-labor cost. The following information relates to the first year of operations:

- Budgeted direct labor and manufacturing overhead were anticipated to be \$200,000 and \$250,000, respectively.
- Job nos. 1, 2, and 3 were begun during the year and had the following charges for direct material and direct labor:

-

<u>Job #</u>	<u>Direct Materials</u>	<u>Direct Labor</u>
1	\$145,000	\$35,000
2	320,000	65,000
3	55,000	80,000

- Job nos. 1 and 2 were completed and sold on account to customers at a profit of 60% of cost. Job no. 3 remained in production.
- Actual manufacturing overhead by year-end totaled \$233,000. Rock Star adjusts all under- and overapplied overhead to cost of goods sold.

- Required:
- Compute the company's predetermined overhead application rate.
 - Compute Rock Star's ending work-in-process inventory.
 - Determine Rock Star's sales revenue.
 - Was manufacturing overhead under- or overapplied during 20x3?
By how much?
 - Present the necessary journal entry to handle under- or overapplied manufacturing overhead at year-end.
 - Does the presence of under- or overapplied overhead at year-end indicate that Rock Star's accountants made a serious error?

True / False Questions

1. When raw materials are issued into production the Raw Materials account is debited.
True False
2. Manufacturing overhead account is debited for the actual overhead costs incurred.
True False
3. Finished Goods inventory account is credited for the amount of cost of goods manufactured during a period.
True False
4. When direct labor costs are incurred, Work in Process is debited.
True False
5. The cost in the ending Finished Goods inventory account consists of the direct materials, direct labor, and manufacturing overhead of all jobs still in process at the end of the period.
True False
6. Selling expenses are applied to production using a predetermined overhead rate.
True False
7. Indirect materials are part of manufacturing overhead.
True False
8. Job cost sheets are used in accounting systems as a subsidiary ledger for the Work-in-Process account.
True False
9. A company that produces cornflakes will most likely use a job-order cost system.
True False
10. Indirect materials issued into production should be debited to Work in Process.
True False

Multiple Choice Questions

1. XYZ company had the following data for the current year:

Work in Process, beginning balance	\$420,000
Direct materials used in production	30,000
Direct labor	55,000
Actual overhead	70,000
Overhead applied	65,000
Work in Process, ending balance	40,000

Determine the amount of cost of goods manufactured during the year.

- a) \$155,000
 - b) \$530,000
 - c) \$535,000
 - d) \$520,000
2. ABC company had the following data for the current year:

Work in Process, beginning balance	\$110,000
Direct materials used in production	45,000
Actual overhead	60,000
Overhead applied	70,000
Work in Process, ending balance	30,000
Cost of goods manufactured	235,000

Determine the amount of direct labor cost incurred during the year.

- a) \$50,000
 - b) \$45,000
 - c) \$40,000
 - d) \$35,000
3. The beginning balance of Raw Materials inventory was \$10,000. During the year purchases of raw materials for \$125,000 were made, but only \$75,000 were paid for. The balance of Raw Materials at the end of the year was \$30,000. What was the amount of raw materials used in production?
- a) \$55,000
 - b) \$95,000
 - c) \$45,000
 - d) 105,000

The next 2 questions refer to the following information.

Z Company uses a job-order costing system and applies overhead based on direct materials used in production. For the recent year it estimated that \$150,000 of manufacturing overhead will be incurred and \$100,000 of direct materials will be used. The following data were provided by the company:

	<u>Beginning</u>	<u>Ending</u>
Raw Materials (all direct)	\$30,000	\$10,000
Work in Process	\$45,000	\$35,000
Finished Goods	\$20,000	\$25,000
Costs incurred during the year:		
Purchases of raw materials (direct)	\$90,000	
Direct Labor	\$40,000	
Actual overhead	\$150,000	

4. The amount of cost of goods manufactured during the year is:
 - a) \$315,000
 - b) \$325,000
 - c) \$360,000
 - d) \$340,000

5. The cost of goods sold not (including any under or overapplied overhead) is:
 - a) \$335,000
 - b) \$320,000
 - c) \$325,000
 - d) \$305,000

6. Finished Goods inventory account is credited when:
 - a) Goods are purchased on account
 - b) Raw materials are purchased
 - c) Goods are sold
 - d) Underapplied overhead is closed

7. Nonmanufacturing costs are:
 - a) Included in manufacturing overhead
 - b) Not part of the product cost
 - c) Deducted from Work in Process
 - d) Added directly to cost of goods sold

8. Total manufacturing costs for the period consist of:
- Direct materials, direct labor and manufacturing overhead applied
 - Manufacturing overhead applied and selling expenses
 - All expenses incurred, including selling and administrative
 - Cost of goods sold plus ending Finished Goods inventory
9. Cost of Goods Sold is derived from:
- Job-cost sheets
 - Raw Materials inventory account
 - Finished Goods inventory account
 - Estimates for the expected level of sales
10. D Company applies manufacturing overhead to jobs using a predetermined overhead rate of 75% of direct labor cost. Any under or overapplied manufacturing overhead cost is closed out to Cost of Goods Sold at the end of the month. During May, the following transactions were recorded by the company:

Raw materials (all direct materials):

Purchased during the month	\$38,000
Used in production	\$35,000

Labor:

Direct labor-hours worked during the month	3,150
Direct labor cost incurred	\$30,000
Manufacturing overhead cost incurred	\$24,500
Direct labor cost included in May 31 work in process	\$4,400

Inventories:

Raw materials (all direct), May 31	\$8,000
Work in process, May 1	\$9,000
Work in process, May 31	\$12,000

The balance on May 1 in the Raw Materials inventory account was:

- \$11,000
- \$5,000
- \$7,000
- \$9,000

Solutions to Practice Problems

Practice Problem #1

$$\text{Predetermined overhead rate: } \frac{\$180,000}{30,000 \text{ MH}} = \$6.00 \text{ per MH}$$

Direct materials used:	500 pounds X \$25.00 =	\$12,500
Direct labor cost:	90 DLH X \$18.00 =	1,620
Overhead applied to job B011:	\$6.00 X 150 MH =	<u>900</u>
Total job cost:		\$15,020

Practice Problem #2

	Chocolate Chip		Oatmeal Raisin	Peanut Butter	Work in Process
Direct Materials	\$500	(3)	\$600	\$350	(6) \$1,450
Direct Labor	\$200		\$250	(7) \$150	\$600
Overhead	(1) \$250	(4)	\$300	(5) \$175	(9) \$725
Total Job Costs	(2) \$950		\$1,150	(8) \$675	(10) \$2,775

- (1) $\$500 \times 50\% = \250
- (2) $\$500 + \$200 + \$250 = \950
- (3) $\$1,150 - \$250 = \$900$ direct materials and overhead
 $\$900 = 150\% \times \text{direct materials}$
 Direct materials = \$600
- (4) $\$1,150 - \$600 - \$250 = \300
- (5) $\$350 \times 50\% = \175
- (6) $\$500 + \$600 + \$350 = \$1,450$
- (7) $\$600 - \$200 - \$250 = \150
- (8) $\$350 + \$150 + \$175 = \675
- (9) $\$250 + \$300 + \$175 = \725
- (10) $\$950 + \$1,150 + 675 = \$2,775$ or $\$1,450 + \$600 + \$725 = \$2,775$

Practice Problem #3

a)

Predetermined overhead rate =	$\frac{\text{Estimated overhead costs}}{\text{Estimated direct labor cost}}$	$\frac{\$600,000}{\$480,000}$	= 125% of direct labor cost
-------------------------------	--	-------------------------------	-----------------------------

b)

Actual manufacturing overhead	\$639,000
less: Applied overhead: \$500,000 x 125%	<u>625,000</u>
Under-applied overhead	\$14,000

c)

Debits to Work-In-Process	\$1,880,000
less: Direct labor	500,000
Applied overhead	<u>625,000</u>
Direct materials used	\$755,000

d)

	<u>Job #18</u>
Direct materials used	\$16,500
Direct labor	36,000
Applied overhead at 125% of direct labor of \$36,000	<u>45,000</u>
Total cost	\$97,000

e)

Accounts receivable	1,472,000	
Sales \$920,000 x 1.60		1,472,000
Cost of goods sold	920,000	
Finished goods		920,000

Practice Problem #4

- a) Estimated Overhead cost $\frac{\$250,000}{\$200,000}$ = 125% of
 Estimated direct labor cost
- b) Job #3:
- | | | |
|------------------|--|-----------|
| Direct materials | | \$55,000 |
| Direct labor | | 80,000 |
| Overhead applied | | 100,000 |
| | | \$235,000 |
- c) Jobs #1 and #2:
- | | | |
|------------------|--|-----------|
| Direct materials | | \$465,000 |
| Direct labor | | 100,000 |
| Overhead applied | | 125,000 |
| | | \$690,000 |
- Revenue $\$690,000 \times 160\% =$ \$1,104,000
- d) Actual manufacturing overhead $\$233,000$
 less: Applied manufacturing overhead $\underline{225,000}$
 Under-applied overhead $8,000$
- e) Cost of goods sold $8,000$
 Manufacturing overhead $8,000$
- f) No. Companies use a predetermined application rate for several reasons including the fact that manufacturing overhead is not easily traced to jobs and products. The predetermined rate is based on estimates of both overhead and an appropriate cost driver, and these estimates rarely equal actual overhead incurred or the actual cost driver activity. Under- or overapplied overhead typically arises at year-end.

Solutions to True / False Problems

1. False - Raw materials account is credited when raw materials are issued.
2. True
3. False – finished goods inventory is debited for cost of goods manufactured and credited for cost of goods sold
4. True
5. False – this is the definition of the balance in work-in-process inventory.
6. False - Selling expenses are expensed as incurred as a period cost.
7. True
8. True
9. False - Process costing is appropriate when all the products (the cornflakes) are essentially the same.
10. False - Indirect materials issued should be debited to Manufacturing Overhead.

Solutions to Multiple Choice Questions

- 1. B
- 2. C
- 3. D
- 4. B
- 5. D
- 6. C
- 7. B
- 8. A
- 9. C
- 10. B