

I. PRODUCT COSTING: There are two fundamental methods of product costing:

A. Job Order Costing

1. Cost Center: The Job in production (an identifiable product)
 - a. DM and DL are directly traceable to the job and overhead is to be allocated based on an "application rate";
 - b. The units of production are distinct and identifiable and customers are willing to pay differential prices for differing products due to those unique characteristics.
2. Cost per unit = DM + DL + Applied OH = Normal Costs

B. Process Costing

1. Cost Center: The production run or product line (units of output are not separately distinguishable)
 - a. No costs are directly traceable to specific products or units of output.
 - b. Production costs are assigned on an average basis and overhead is assigned on some "acceptable" basis, usually based on units produced.
2. Cost per unit = $\frac{\text{total material} + \text{total labor} + \text{total OH}}{\text{number of units produced}}$

C. Factors Used to Choose Which System is Appropriate for a Given Application

1. Nature of the production:
 - a. If labor and material are not directly traceable to a given unit of production, process costing must be used
2. Nature of the end product:
 - a. If customers are not willing to pay a differential price for alternative products, the added cost of a product costing system is not cost effective

II. Job Order Costing

A. Overhead (OH) and Job Order Costing

1. Overhead must be applied to (absorbed by) on some reasonable basis because it cannot be directly traced to the production. Job order costing systems distinguish between three types of overhead:
 - a. Budgeted OH: The estimated OH at the beginning of the accounting cycle
 - b. Actual OH: The actual OH charges as recorded in the OH control account
 - c. Applied OH: The OH applied to the job during the period based on the application rate and budgeted OH numbers agreed upon at the beginning of the accounting cycle
2. In any given period the overhead applied to the production will differ from the actual overhead incurred on the job. The amount of over/under applied overhead must be used to adjust the COS account at the end of the accounting cycle.
 - a. Add under-applied OH to COS
 - b. Deduct over-applied OH to COS

III. The uses of Costing Systems: Internal accounting systems have two purposes: **decision making (planning and control)** and **inventory valuation**.

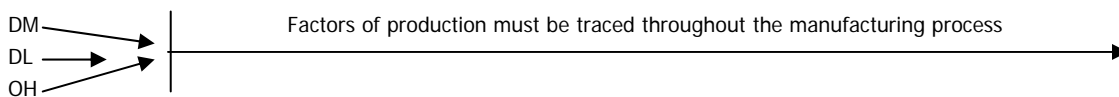
Note: The following discussion concentrates on inventory valuation only. The planning and control aspects will be discussed in handout 5-2A

A. **The Problem**: How to gather all the data from the various departments.

1. The factors of production, Direct Material (DM), Direct Labor (DL) and Factory Overhead (OH) must be traced through the manufacturing process accurately and **in a timely manner** in order to determine the cost of a product

B. **The Situation**: In a manufacturing company, costs must be traced through at least four stages of production:

Input WIP Inventory Finished Goods Inventory Cost of Goods Sold



C. **Methodology**: here are two basic methods of product costing:

1. Job Order Costing

- a. Cost Center (Cost Object): The Job in production (an identifiable product)
 1. DM and DL are directly traceable to the job and overhead is to be allocated based on an "application rate";
 2. The units of production are distinct and identifiable and customers are willing to pay differential prices for differing products due to

those unique characteristics.

b. Cost per unit = DM + DL + Applied OH = **Normal Costs**

2. **Process Costing**

a. **Cost Center (Cost Object):** The production run or product line (units of output are not separately distinguishable; i.e. products like bread, gasoline, spaghetti sauce etc.)

1. No costs are directly traceable to specific products or units of output.
2. Production costs are assigned on an average basis and overhead is assigned on some "acceptable" basis, usually based on units produced.

b. Cost per unit = $\frac{\text{total material} + \text{total labor} + \text{total OH}}{\text{number of units produced}}$

c. **Equivalent units of production:** Process costing is used in applications in which homogeneous/indistinguishable inputs are combined to produce finished goods. For purposes of inventory costing of homogeneous/indistinguishable products it is useful to assume that ten units that are 50% complete are the same as 5 units 100% complete. This is termed the concept of **equivalent finished units** or **equivalent units (EU)**. Equivalent units must be computed for each factor of production i.e. compute EU for DM, DL and OH.

1. To illustrate the computation of Equivalent units assume the following facts:

	(Ending WIP)		
Units Completed	Units on Hand	Beginning Inventory	Ending Inventory
In Current Period	End of Period	% Completion	% Completion
14,000	2,000		
Direct Material.....		50%	60%
Direct Labor.....		30%	70%
Manufacturing Overhead.....		20%	90%

Equivalent finished units:

	Completed	+(Beg Inv)	+ (End Inv)	= EU
EU-Direct Material =	14,000	-.5(2,000)	+.6(2,000)	14,200
EU-Direct Labor =	14,000	-.3(2,000)	+.7(2,000)	14,800
EU-Overhead =	14,000	-.2(2,000)	+.9(2,000)	15,400

3. **Factors Used to Choose Which System is Appropriate for a Given Application**

- a. **Nature of the production:**
 1. If labor and material are not directly traceable to a given unit of production, process costing must be used
- b. **Nature of the end product:**
 1. If customers are not willing to pay a differential price for alternative products, the added cost of a product costing system is not cost effective

II. **JOB ORDER COSTING IN MANUFACTURING COMPANIES:**

A. **Overhead (OH) and Job Order Costing**

1. Overhead must be applied to (absorbed by) on some reasonable basis because it cannot be directly traced to the production. Job order costing systems distinguish between three types of overhead:
 - a. **Budgeted OH:** The estimated OH at the beginning of the accounting cycle
 - b. **Actual OH:** The actual OH charges as recorded in the OH control account
 - c. **Applied OH:** The OH applied to the job during the period based on the application rate and budgeted OH numbers agreed upon at the beginning of the accounting cycle
2. In any given period the overhead applied to the production will differ from the actual overhead incurred on the job. The amount of over/under applied overhead must be used to adjust the COS account at the end of the accounting cycle.
 - a. Add under-applied OH to COS
 - b. Deduct over-applied OH to COS

B. **Applying Overhead in Job Order Costing**

1. In order to compute the full cost of various inventories prior to the end of the production process and/or prior to the time that the bill for indirect costs has arrived, decision makers must either estimate overhead costs prior to the arrival of bills or wait until the bills have arrived and the information is no longer useful, because it is so late in the planning process. In order to make timely decisions, overhead must be applied to the inventory in some arbitrary manner.

Time _____ Note that as time passes, information becomes more accurate but less useful _____>

Useful information _____ More Accurate Information
 Based on Estimates Less useful because it is received late in the decision process

NOTE: *Direct Material* and *Direct Labor* are directly traceable to the cost object; on the other hand, because factory overhead is an indirect cost, an application procedure must be utilized for overhead for two reasons:

- a. the actual amount of factory overhead is not known and is not directly traceable to the various inventories and
- b. planners cannot wait until the actual amount of OH is known, because by that time, the time for useful decisions would have past.

NOTE: At this time, we are only concerned with the process of estimating the amount of factory overhead (the overhead application process), in future chapters we will discuss the process of allocating overhead amongst the various inventories. **The OH application process** relates to the process of estimating the full cost of the cost object; whereas **the OH allocation process** relates to the process of allocating the costs of production amongst the various inventories. It is important to make that distinction at an early stage of the learning process.

2. The process of applying overhead is an arbitrary one. Its' goal is to enable planners to compute the full cost of a cost object. The process consist of six steps:
 - a. **step one:** The budgeted amount of overhead (indirect production costs) expected for the period is estimated. (This is part of the budgeting process);
 - b. **step two:** Management determines the **denominator level of activity (sometimes called the allocation base)** based on the type of activity most closely related to overhead for each specific circumstance (typical examples are: DL hours; machine hours; units of production etc.)
 1. Objectives in selecting an allocation base:
 - a. should be relatively constant from period to period (may use an annualized rate or average if necessary)
 - b. easy to keep track of
 - c. **step three:** the budgeted overhead application rate is determined by dividing the budgeted overhead by the appropriate denominator level of activity;

$$\text{Budgeted application rate} = \frac{\text{Budgeted Factory Overhead}}{\text{Budgeted Denominator Level of Activity}}$$

- d. **step four:** The actual denominator level of activity is determined
- e. **step five:** Overhead is applied to the cost object by multiplying the actual denominator level of activity by the budgeted application rate:

Factory Overhead Applied = (Actual Denominator Level of Activity) (Budgeted Application Rate)

Overhead Applied **must always be designated as over or under applied.**

- F. **step six:** At the end of the accounting period, the difference between the factory overhead applied in step five must be reconciled with the actual factory overhead incurred. The difference is called over-applied (OH applied is greater than budgeted OH) or under-applied overhead (OH applied is less than budgeted OH).
 1. **Over-applied OH** is credited (a reduction) to cost of goods sold (or allocated between WIP, FG and COS);
 2. **Under-applied OH** is debited (an increase) to cost of goods sold (or allocated between WIP, FG and COS);

Note: On interim financial statements over/under-applied overhead is sometimes carried on the balance sheet and not charged to COS or allocated between COS, WIP or FG inventories; this has the effect of treating the difference between actual cost and actual cost as an unexpired cost (an asset). The rationale is that interim financial statement under/over-applications may be temporal in nature. The final decision on how to treat applied overhead on the interim financial statements is dependent upon management prerogatives and the expected final period results.

NOTE: Several alternative procedures are available for the treatment of Over/Under-applied OH. These procedures will be discussed in future examples. Suffice it to say at this point that direct adjustment to cost of goods sold is common practice unless other methods are demonstrably superior in producing more meaningful data.

Actual amounts of DM and DL plus the applied factory overhead is referred to as the **NORMAL COST** of inventory; The **ACTUAL COST** of inventory consist of all actual costs incurred but is rarely used in practice because it takes to long to determine the actual amounts of factory overhead.

3. Job Order Costing Journal Entries:

a. <u>Purchase materials</u>		
Stores control (actual cost).....	60,000	
Accounts Payable.....		60,000
b. <u>Issue supplies and materials for a job and record cost of indirect material used</u>		
WIP control (actual cost of DM charged to a specific job).....	48,000	
Factory OH Control (not directly traceable to job; allocated to dept and assigned to job).	4,000	
Stores Control (actual cost of all material used).....		52,000
c. <u>Record Labor Cost</u>		
WIP control (actual cost of DL charged to a specific job).....	39,000	
Factory OH Control (not directly traceable to job; allocated to dept and assigned to job)..	5,000	
Accrued Payroll (actual cost of all labor used).....		44,000

Note: The items of material, labor and other miscellaneous costs charged to Factory OH control are not directly traceable to a specific job. These items are assigned to various departments that are working on various jobs and then assigned by the departments to the jobs. These costs represent the actual costs of these indirect items.

d. <u>Record Payment of Wages</u>		
Accrued payroll (actual payroll costs incurred).....	44,000	
Cash.....		44,000
e. <u>Record the Incurrence of Miscellaneous other indirect costs</u>		
Factory OH Control (actual amounts; refer to note in box above for explanation).....	18,000	
Accounts payable.....		11,000
Prepaid insurance.....		1,000
Accumulated Depreciation.....		6,000
f. <u>Apply OH to WIP control to achieve "Normal Cost" of WIP inventory</u>		
WIP Control (OH application rate) x (Actual base level of activity).....	26,460	
Factory OH applied (note the difference between this account and Factory OH control).		26,460
g. <u>Transfer completed WIP inventory to FG inventory</u>		
Finished Goods Control (sum of WIP control job cost sheets).....	108,800	
WIP Control.....		108,800
h. <u>Close Factory OH Applied against Factory OH Control</u>		
Factory OH applied.....	26,460	
Cost of Goods sold (or charge to under-applied inventory then close to COS).....	540	
Factory OH Control (balance).....		27,000

4. The Overhead application process illustrated:

- a. To illustrate the OH application process, assume the following facts:
 1. LYC Inc. manufactures four distinct types of computers (referred to as Type 1, Type 2 etc.).
 2. LYC Inc. has firm orders for one computer for one computer of each type in the month of January.
 3. LYC Inc. **budgeted operating data** for January is as follows:

Budgeted					
<u>Operating Data</u>	<u>Type 1</u>	<u>Type 2</u>	<u>Type 3</u>	<u>Type 4</u>	<u>Total</u>
Prime costs:					
DM:.....	\$ 3,000,000	\$ 5,000,000	\$ 8,000,000	\$ 4,000,000	\$20,000,000
DL:.....	<u>5,000,000</u>	<u>8,000,000</u>	<u>10,000,000</u>	<u>7,000,000</u>	<u>30,000,000</u>
	\$ 8,000,000	\$13,000,000	\$18,000,000	\$11,000,000	\$50,000,000
Selling price:					
	\$15,000,000	\$24,000,000	\$31,000,000	\$20,000,000	\$90,000,000

Note: These are the "Budgeted" figures that will be used in the computations on the following page.

Budgeted DL hours 2,000 4,000 4,000 2,000 12,000
 estimated (e.g. Budgeted) total factory overhead is \$30,000,000.

4. LYC Inc. **actual operating data** for January is as follows:

Actual Operating Data	Type 1	Type 2	Type 3	Type 4	Total
Prime costs:					
DM:.....	\$ 3,500,000	\$ 5,500,000	\$ 8,500,000	\$ 4,500,000	\$22,000,000
DL:.....	<u>5,250,000</u>	<u>8,250,000</u>	<u>10,250,000</u>	<u>7,250,000</u>	<u>31,000,000</u>
	\$ 8,750,000	\$13,750,000	\$18,750,000	\$11,750,000	\$53,000,000
Selling price:	\$15,000,000	\$24,000,000	\$31,000,000	\$20,000,000	\$90,000,000
Actual DL hours:	2,500	4,500	4,500	2,500	14,000
Actual factory overhead total is		\$30,500,000			

Note: These are the "Actual" figures that will be used in the computations on the following page.

Required:

1. Determine the normal cost of inventory, the actual cost of goods sold and gross profit for each type of computer based on the following denominator levels of activity:
 - (1). DM cost
 - (2). DL cost
 - (3). Prime cost
 - (4). DL hours
 - (5). Selling Price
 - (6). Contribution margin

Solution:

Requirement 1. **OH is applied on the basis of DM cost:**

- Step 1:** Estimated total factory overhead is \$30,000,000
- Step 2:** Denominator level of activity for requirement (1) is DM\$
- Step 3:** Budgeted overhead rate is

$$\frac{\text{Budgeted factory OH (see prior page)}}{\text{Budgeted DM\$ is used in requirement (1)}} = \frac{\$30,000,000}{\$20,000,000} = \$1.50 \text{ per DM\$}$$

Step 4: The actual denominator level of activity is determined: \$3,500,000 actual DM\$ (per *actual* table from prior page)

Step 5: OH is applied by multiplying the actual denominator level of activity by the budgeted application rate:
 \$1.50 application rate x \$3,500,000 actual DL\$ = \$5,250,000

Step 6: Compute over/under-applied overhead by comparing OH applied to the actual OH incurred.

OH applied: \$ 5,250,000 per step 5
 Actual OH

Operating Data	Type 1	Type 2	Type 3	Type 4	Total
Selling price:	\$15,000,000	\$24,000,000	\$31,000,000	\$20,000,000	\$90,000,000
Prime costs:					
DM:.....	\$ 3,500,000	\$ 5,500,000	\$ 8,500,000	\$ 4,500,000	\$22,000,000
DL:.....	<u>5,250,000</u>	<u>8,250,000</u>	<u>10,250,000</u>	<u>7,250,000</u>	<u>31,000,000</u>
	\$ 8,750,000	\$13,750,000	\$18,750,000	\$11,750,000	\$53,000,000
Overhead Applied:	\$ 5,250,000*	\$ 8,250,000*	\$12,750,000*	\$ 6,750,000*	\$33,000,000
Normal Cost of Inv.:	\$14,000,000	\$22,000,000	\$31,500,000	\$18,500,000	\$86,000,000
Less: over-applied OH:	(397,727)**	(625,000)**	(965,909)**	(511,364)**	(2,500,000)***
Cost of goods sold:	\$13,602,273	\$21,375,000	\$30,534,091	\$17,988,636	\$83,500,000
Gross profit:					\$ 6,500,000

* Computed as follows: OH Application rate (Actual Denominator Level of Activity) = \$1.50 x \$3,500,000 = \$5,250,000

** Computed as follows: Application basis (e.g. what you are using to apply OH) x (Actual OH – Applied OH)

Actual Total Denominator level of activity

Actual DM\$ for Type 1

Example for Type 1: $\frac{\$ 3,500,000}{\$22,000,000} \times (\$30,500,000 - \$33,000,000) = (\$397,727)$

Actual Total DM\$ for all types (see prior page)

Requirement 2. **OH is applied on the basis of Direct Labor Cost:**

Operating Data	Type 1	Type 2	Type 3	Type 4	Total
Selling price:	\$15,000,000	\$24,000,000	\$31,000,000	\$20,000,000	\$90,000,000
Direct Labor Cost:					
DM:.....	\$ 3,500,000	\$ 5,500,000	\$ 8,500,000	\$ 4,500,000	\$22,000,000
DL:.....	<u>5,250,000</u>	<u>8,250,000</u>	<u>10,250,000</u>	<u>7,250,000</u>	<u>31,000,000</u>
	\$ 8,750,000	\$13,750,000	\$18,750,000	\$11,750,000	\$53,000,000
Overhead Applied:	\$ 5,250,000*	\$ 8,250,000*	\$10,250,000*	\$ 7,250,000*	\$31,000,000
Normal Cost of Inv.:	\$14,000,000	\$22,000,000	\$31,500,000	\$18,500,000	\$84,000,000
Less: over-applied OH:	(84,677)**	(133,065)**	(165,323)**	(116,935)**	(500,000)
Cost of goods sold:	\$13,915,323	\$21,866,935	\$30,334,677	\$17,383,065	\$83,500,000
Gross profit:					\$ 6,500,000

* Computed as follows: $\frac{\text{Budgeted Overhead}}{\text{Budgeted Denominator level of activity}} = \text{OH Application rate (Actual Denominator Level of Activity)}$

Example for Type 1: $\frac{\$30,000,000}{\$30,000,000} = \$1.00 (\$5,250,000) = \$5,250,000$

** Computed as follows: $\frac{\text{Application basis}}{\text{Actual Denominator level of activity}} \times (\text{Over/under-applied OH})$

Example for Type 1: $\frac{\$ 5,250,000}{\$31,000,000} \times (\$500,000) = (\$84,677)$

Requirement 3. **OH is applied on the basis of Prime Cost: (Prime Costs = DM + DL)**

Operating Data	Type 1	Type 2	Type 3	Type 4	Total
Selling price:	\$15,000,000	\$24,000,000	\$31,000,000	\$20,000,000	\$90,000,000
Direct Labor Cost:					
DM:.....	\$ 3,500,000	\$ 5,500,000	\$ 8,500,000	\$ 4,500,000	\$22,000,000
DL:.....	<u>5,250,000</u>	<u>8,250,000</u>	<u>10,250,000</u>	<u>7,250,000</u>	<u>31,000,000</u>
	\$ 8,750,000	\$13,750,000	\$18,750,000	\$11,750,000	\$53,000,000
Overhead Applied:	<u>\$ 5,250,000*</u>	<u>\$ 8,250,000*</u>	<u>\$11,250,000*</u>	<u>\$ 7,050,000*</u>	<u>\$31,800,000</u>
Normal Cost of Inv.:	\$14,000,000	\$22,000,000	\$30,000,000	\$18,800,000	\$84,800,000
Less: over-applied OH:	(214,623)**	(337,264)**	(459,906)**	(288,207)**	(1,300,000)
Cost of goods sold:	\$13,785,377	\$21,622,736	\$29,540,094	\$17,511,793	<u>\$83,500,000</u>
Gross profit:					\$ 6,500,000

* Computed as follows: $\frac{\text{Budgeted Overhead}}{\text{Budgeted Denominator level of activity}} = \text{OH Application rate (Actual Denominator Level of Activity)}$

Example for Type 1: $\frac{\$30,000,000}{\$50,000,000} = .60$ (\$8,750,000) = \$5,250,000

** Computed as follows: $\frac{\text{Application basis}}{\text{Actual Denominator level of activity}} \times (\text{Over/under-applied OH})$

Example for Type 1: $\frac{\$8,750,000}{\$53,000,000} \times (\$1,300,000) = (\$214,632)$

Requirement 4. **OH is applied on the basis of Direct Labor Hours:**

Operating Data	Type 1	Type 2	Type 3	Type 4	Total
Selling price:	\$15,000,000	\$24,000,000	\$31,000,000	\$20,000,000	\$90,000,000
Direct Labor Cost:					
DM:.....	\$ 3,500,000	\$ 5,500,000	\$ 8,500,000	\$ 4,500,000	\$22,000,000
DL:.....	<u>5,250,000</u>	<u>8,250,000</u>	<u>10,250,000</u>	<u>7,250,000</u>	<u>31,000,000</u>
	\$ 8,750,000	\$13,750,000	\$18,750,000	\$11,750,000	\$53,000,000
Overhead Applied:	<u>\$ 6,250,000*</u>	<u>\$11,250,000*</u>	<u>\$11,250,000*</u>	<u>\$ 6,250,000*</u>	<u>\$35,000,000</u>
Normal Cost of Inv.:	\$15,000,000	\$25,000,000	\$30,000,000	\$18,000,000	\$88,000,000
Less: over-applied OH:	(803,571)**	(1,446,429)**	(1,446,429)**	(803,571)**	(4,500,000)
Cost of goods sold:	\$14,196,429	\$23,553,571	\$28,553,571	\$17,196,429	<u>\$83,500,000</u>
Gross profit:					\$ 6,500,000

* Computed as follows: $\frac{\text{Budgeted Overhead}}{\text{Budgeted Denominator level of activity}} = \text{OH Application rate (Actual Denominator Level of Activity)}$

Example for Type 1: $\frac{\$30,000,000}{12,000} = \$2,500$ per DL hour (2,500) = \$6,250,000

** Computed as follows: $\frac{\text{Application basis}}{\text{Actual Denominator level of activity}} \times (\text{Over/under-applied OH})$

Example for Type 1: $\frac{2,500}{14,000} \times (\$4,500,000) = (\$803,571)$

Requirement 5. **OH is applied on the basis of Selling Price:**

<u>Operating Data</u>	<u>Type 1</u>	<u>Type 2</u>	<u>Type 3</u>	<u>Type 4</u>	<u>Total</u>
Selling price:	\$15,000,000	\$24,000,000	\$31,000,000	\$20,000,000	\$90,000,000
Direct Labor Cost:					
DM:.....	\$ 3,500,000	\$ 5,500,000	\$ 8,500,000	\$ 4,500,000	\$22,000,000
DL:.....	<u>5,250,000</u>	<u>8,250,000</u>	<u>10,250,000</u>	<u>7,250,000</u>	<u>31,000,000</u>
	\$ 8,750,000	\$13,750,000	\$18,750,000	\$11,750,000	\$53,000,000
Overhead Applied:	<u>\$ 5,000,000*</u>	<u>\$ 8,000,000*</u>	<u>\$10,333,333*</u>	<u>\$ 6,666,667*</u>	<u>\$30,000,000</u>
Normal Cost of Inv.:	\$13,750,000	\$21,750,000	\$29,083,333	\$18,416,667	\$83,000,000
Add: Under-applied OH:	83,333 **	133,333 **	172,222	111,112 **	500,000
Cost of goods sold:	\$13,833,333	\$21,883,333	\$29,255,555	\$18,527,779	<u>\$83,500,000</u>
Gross profit:					\$ 6,500,000

* Computed as follows: $\frac{\text{Budgeted Overhead}}{\text{Budgeted Denominator level of activity}} = \text{OH Application rate (Actual Denominator Level of Activity)}$

Example for Type 1: $\frac{\$30,000,000}{\$90,000,000} = \$0.333 \text{ per Sales Dollar } (15,000,000) = \$5,000,000$

** Computed as follows: $\frac{\text{Application basis}}{\text{Actual Denominator level of activity}} \times (\text{Over/under-applied OH})$

Example for Type 1: $\frac{\$15,000,000}{\$90,000,000} \times \$500,000 = \$83,333$

Requirement 6. **OH is applied on the basis of Contribution Margin: (Contribution Margin = Revenue – Variable costs)**

<u>Operating Data</u>	<u>Type 1</u>	<u>Type 2</u>	<u>Type 3</u>	<u>Type 4</u>	<u>Total</u>
Selling price:	\$15,000,000	\$24,000,000	\$31,000,000	\$20,000,000	\$90,000,000
Direct Labor Cost:					
DM:.....	\$ 3,500,000	\$ 5,500,000	\$ 8,500,000	\$ 4,500,000	\$22,000,000
DL:.....	<u>5,250,000</u>	<u>8,250,000</u>	<u>10,250,000</u>	<u>7,250,000</u>	<u>31,000,000</u>
	\$ 8,750,000	\$13,750,000	\$18,750,000	\$11,750,000	\$53,000,000
Overhead Applied:	<u>\$ 4,687,500*</u>	<u>\$ 7,687,500*</u>	<u>\$ 9,187,500*</u>	<u>\$ 6,187,500*</u>	<u>\$27,750,000</u>
Normal Cost of Inv.:	\$13,437,500	\$21,437,500	\$27,937,500	\$17,937,500	\$80,750,000
Add: Under-applied OH:	464,527 **	761,824 **	910,473	613,177 **	2,750,000
Cost of goods sold:	\$13,902,027	\$22,199,325	\$28,847,973	\$18,550,675	<u>\$83,500,000</u>
Gross profit:					\$ 6,500,000

* Computed as follows: $\frac{\text{Budgeted Overhead}}{\text{Budgeted Denominator level of activity}} = \text{OH Application rate (Actual Denominator Level of Activity)}$

Example for Type 1: $\frac{\$30,000,000}{\$40,000,000} = \$0.75 \text{ per Sales Dollar } (\$15,000,000 - \$8,750,000 = 4,687,500)$

** Computed as follows: $\frac{\text{Application basis}}{\text{Actual Denominator level of activity}} \times (\text{Over/under-applied OH})$

Example for Type 1: $\frac{\$ 6,250,000}{\$37,000,000} \times \$2,750,000 = \$464,527$

II REVIEW QUESTIONS:

1. A job-order costing system would be more suitable than an operation costing system for the manufacture of bricks.
T F
2. A process cost system would be less appropriate for the manufacture of bricks than for the construction of brick apartment houses
T F
3. The use of a budgeted annual rate for applying factory overhead would usually produce more accurate costing of products than would the use of an actual annual rate.
T F
4. The use of an actual annual rate for applying factory overhead cost would usually produce more accurate costing of products than would the use of a budgeted annual rate.
T F
5. Budgeted factory overhead minus actual factory overhead equals over-applied factory overhead.
T F
6. Under-applied or over-applied factory overhead is the difference between the applied factory overhead and the budgeted factory overhead.
T F
7. Actual factory overhead minus under-applied factory overhead equals applied factory overhead.
T F
8. The subsidiary ledger accounts for factory department overhead contain debit entries for actual overhead cost.
T F
9. The typical end-of-year treatment of over-applied factory overhead is to deduct it from cost of goods sold.
T F
10. There was no beginning inventory for a certain month in the Cooking Process of Zebulon Company. During the month, 15,000 units were started, of which all were completed and transferred out except 20%, which were 60% completed. The number of equivalent units produced was 13,200.
T F
11. Examples of products or operations for which a process costing system would probably be appropriate include:
(1) aircraft production (3) flour milling
(2) building construction (4) book publishing
12. Stores requisitions are used in a job-order costing system as:
(1) subsidiary ledgers of materials on hand
(2) media for charging costs to jobs and departments
(3) part of the subsidiary factory department overhead cost records
(4) none of the above
13. The subsidiary ledger for the factory department overhead control account typically contains entries for:
(1) budgeted overhead (3) actual overhead
(2) applied overhead (4) all of the above costs
14. In a job-order cost system, factory overhead applied should be:
(1) credited to Work in Process
(2) credited to Factory Overhead Applied
(3) debited to Factory Department Overhead
(4) debited to Finished Goods Control
15. When direct materials are issued to production departments under a job-order cost system, a credit should be made to:
(1) Stores (3) Job-cost records
(2) Work in Process (4) Factory Overhead

16. Using an actual rate for applying factory overhead would be preferable to using a budgeted rate, if your overriding concern is:

- (1) accuracy of determination of product costs
- (2) timeliness of determination of product costs
- (3) economy of bookkeeping and accounting
- (4) usefulness to management of product costs

17. Under-applied factory overhead is the excess of:

- (1) budgeted overhead over applied overhead
- (2) actual overhead over applied overhead
- (3) applied overhead over actual overhead
- (4) actual overhead over budgeted overhead

18. The usual year-end treatment of under-applied factory overhead is to:

- (1) debit Cost of Goods Sold
- (2) debit Cost of Goods Sold and appropriate inventory accounts
- (3) credit Cost of Goods Sold
- (4) credit Cost of Goods Sold and appropriate inventory accounts

19. The usual end-of-year treatment of over-applied factory overhead is to:

- (1) credit Cost of Goods Sold
- (2) debit Cost of Goods Sold
- (3) debit Cost of Goods Sold and appropriate inventory accounts
- (4) credit Cost of Goods Sold and appropriate inventory accounts

20. A normal absorption costing system provides for charging Work in Process with:

- (1) actual direct labor costs and actual factory overhead costs
- (2) applied direct labor costs and actual factory overhead costs
- (3) applied direct labor costs and applied factory overhead costs
- (4) actual direct labor costs and applied factory overhead costs

21. Given:

	Case A	Case B
Budgeted direct-labor hours	400,000 hrs.	600,000 hrs.
Budgeted factory overhead cost	\$900,000	\$720,000
Actual direct-labor hours	420,000 hrs.	550,000 hrs.
Actual factory overhead cost	\$932,000	\$680,000

Overhead is to be applied on the basis of direct labor hours

Required: For both case A and B compute the following:

- (a) Budgeted overhead rate
- (b) Applied factory overhead cost
- (c) Amount of under-applied or over-applied factory overhead cost
(indicate whether under or over)

- 1. F
- 2. F
- 3. F
- 4. T
- 5. F
- 6. F
- 7. T
- 8. T
- 9. T
- 10. T
- 11. (3)
- 12. (2)
- 13. (3)
- 14. (2)

15. (1)

16. (1)

17. (2)

18. (1)

19. (1)

20. (4)

21.

	<u>Case A</u>	<u>Case B</u>
(a) Budgeted overhead rate	\$ 2.25	\$ 1.20
(b) Applied factory overhead cost	\$ 945,000	\$ 660,000
(c) Amount of under-applied or over-applied factory overhead cost	\$ 15,000 over	\$ 20,000 under

(indicate whether under or over)