[COST ACCOUNTING]

♣ Allocation of Joint Costs and Accounting for By-products

I. Theories

Multiple Choice

Select the letter of the best answer.

- 1. The point in a joint production process where each individual product becomes separately identifiable is commonly called the:
 - A. decision point.
 - B. separation point.
 - C. individual product point.
 - D. split-off point.
 - E. joint product point.
- 2. The joint-cost allocation method that recognizes the revenues at split-off but does not consider any further processing costs is the:
 - A. relative-sales-value method.
 - B. net-realizable-value method.
 - C. physical-units method.
 - D. reciprocal-accounting method.
 - E. gross margin at split-off method.
- 3. Which of the following methods should be selected if a company terminates all processing at the split-off point and desires to use a cost-allocation approach that considers the "revenue-producing ability" of each product?
 - A. Gross margin at split-off method.
 - B. Reciprocal-accounting method.
 - C. Relative-sales-value method.
 - D. Physical-units method.
 - E. Net-realizable-value method.
- 4. Which of the following choices correctly denotes the data needed to allocate joint costs under the relative-sales-value method?

	Sales Value		Sales Value of
	of Product	Separable	Product After
	at Split-Off	<u>Cost</u>	Processing Beyond
			Split-Off
A.	Yes	Yes	No
B.	Yes	Yes	Yes
C.	Yes	No	No
D.	No	Yes	Yes
E.	No	No	Yes

5. When allocating joint costs, Wolstein calculates the final sales value of the various products manufactured and subtracts appropriate separable costs. The company is using the:

- A. gross margin at split-off method.
- B. reciprocal-accounting method.
- C. relative-sales-value method.
- D. physical-units method.
- E. net-realizable-value method.
- 6. Which of the following statements about joint-cost allocation is <u>false</u>?
 - A. Joint-cost allocation is useful in deciding whether to further process a product after split-off.
 - B. Joint-cost allocation is useful in making a profit determination about individual joint products.
 - C. Joint-cost allocation is helpful in inventory valuation.
 - D. Joint-cost allocation can be based on the number of units produced.
 - E. Joint-cost allocation can be accomplished by using several different methods that focus on sales value and product "worth."
- 7. Consider the following statements about joint product cost allocation:
 - I. Joint product cost is allocated because it is necessary for inventory valuation.
 - II. Joint product cost is allocated because it is necessary for making economic decisions about individual products (e.g., sell at split-off or process further).
 - III. Joint cost may be allocated to products by using several different methods.

Which of the above statements is (are) correct?

- A. I only.
- B. III only.
- C. I and II.
- D. I and III.
- E. I, II, and III.
- 8. Eastside Hospital has two service departments (Patient Records and Accounting) and two "production" departments (Internal Medicine and Surgery). Which of the following allocations would likely take place under the reciprocal-services method of cost allocation?
 - A. Allocation of Accounting cost to Patient Records.
 - B. Allocation of Patient Records cost to Internal Medicine.
 - C. Allocation of Surgery cost to Accounting.
 - D. Allocation of Internal Medicine cost to Surgery.
 - E. Allocations "A" and "B" above.
- 9. Westside Hospital has two service departments (Patient Records and Accounting) and two "production" departments (Internal Medicine and Surgery). Which of the following allocations would <u>not</u> take place under the reciprocal-services method of cost allocation?
 - A. Allocation of Accounting cost to Patient Records.
 - B. Allocation of Patient Records cost to Internal Medicine.
 - C. Allocation of Surgery cost to Accounting.
 - D. Allocation of Internal Medicine cost to Surgery.
 - E. Allocations "C" and "D" above.
- 10. If a company obtains two salable products from the refining of one ore, the refining process should be accounted for as a(n)

- a. mixed cost process.
- b. joint process.
- c. extractive process.
- d. reduction process.
- 11. Joint costs are allocated to joint products to
 - a. obtain a cost per unit for financial statement purposes.
 - b. provide accurate management information on production costs of each type of product.
 - c. compute variances from expected costs for each joint product.
 - d. allow the use of high-low analysis by the company.
- 12. Joint costs are allocated to which of the following products?

<u>By</u>	-products	<u>Scrap</u>
a.	yes	yes
b.	yes	no
c.	no	no
d.	no	yes

- 13. Joint cost allocation is useful for
 - a. decision making.
 - b. product costing.
 - c. control.
 - d. evaluating managers' performance.
- 14. Joint costs are useful for
 - a. setting the selling price of a product.
 - b. determining whether to continue producing an item.
 - c. evaluating management by means of a responsibility reporting system.
 - d. determining inventory cost for accounting purposes.
- 15. Which of the following components of production are allocable as joint costs when a single manufacturing process produces several salable products?
 - a. direct material, direct labor, and overhead
 - b. direct material and direct labor only
 - c. direct labor and overhead only
 - d. overhead and direct material only
- 16. Each of the following is a method to allocate joint costs **except**
 - a. relative sales value.
 - b. relative net realizable value.
 - c. relative weight, volume, or linear measure.
 - d. average unit cost.
- 17. Joint costs are most frequently allocated based upon relative
 - a. profitability.
 - b. conversion costs.

- c. prime costs.
- d. sales value.
- 18. When allocating joint process cost based on tons of output, **all** products will
 - a. be salable at split-off.
 - b. have the same joint cost per ton.
 - c. have a sales value greater than their costs.
 - d. have no disposal costs at the split-off point.
- 19. If two or more products share a common process before they are separated, the joint costs should be assigned in a manner that
 - a. assigns a proportionate amount of the total cost to each product on a quantitative basis.
 - b. maximizes total earnings.
 - c. minimizes variations in unit production costs.
 - d. does not introduce an element of estimation into the process of accumulating costs for each product.
- 20. Scrap is defined as a
 - a. finished unit of product that has no sales value.
 - b. residual of the production process that has limited sales value.
 - c. residual of the production process that can be reworked for sale as an irregular unit of product.
 - d. residual of the production process that has no sales value.
- 21. Waste created by a production process is
 - a. accounted for in the same manner as defective units.
 - b. accounted for as an abnormal loss.
 - c. material that can be sold as an irregular product.
 - d. discarded rather than sold.
- 22. While preparing a salad, you remove the core of a head of lettuce. This core would be classified as
 - a. defective.
 - b. shrinkage.
 - c. waste.
 - d. scrap.
- 23. Which of the following is/are synonyms for joint products?

Main products		<u>Co-products</u>	
a.	no	no	
b.	yes	yes	
c.	yes	no	
d.	no	yes	

- 24. In a lumber mill, which of the following would most likely be considered a primary product?
 - a. 2 x 4 studs
 - b. sawdust

- c. wood chips
- d. tree bark
- 25. Fisher Company produces three products from a joint process. The products can be sold at split-off or processed further. In deciding whether to sell at split-off or process further, management should
 - a. allocate the joint cost to the products based on relative sales value prior to making the decision.
 - b. allocate the joint cost to the products based on a physical quantity measure prior to making the decision.
 - c. subtract the joint cost from the total sales value of the products before determining relative sales value and making the decision.
 - d. ignore the joint cost in making the decision.
- 26. By-products are
 - a. allocated a portion of joint production cost.
 - b. not sufficient alone, in terms of sales value, for management to justify undertaking the joint process.
 - c. also known as scrap.
 - d. the primary reason management undertook the production process.
- 27. Which of the following statements is **true** regarding by-products or scrap?
 - a. Process costing is the only method that should result in by-products or scrap.
 - b. Job order costing systems will never have by-products or scrap.
 - c. Job order costing systems may have instances where by-products or scrap result from the production process.
 - d. Process costing will never have by-products or scrap from the production process.
- 28. Which of the following has sales value?

<u>By</u>	<u>-products</u>	<u>Waste</u>
a.	no	no
b.	yes	no
c.	yes	yes
d.	no	yes

- 29. Under an acceptable method of costing by-products, inventory costs of the by-product are based on the portion of the joint production cost allocated to the by-product
 - a. but any subsequent processing cost is debited to the cost of the main product.
 - b. but any subsequent processing cost is debited to revenue of the main product.
 - c. plus any subsequent processing cost.
 - d. minus any subsequent processing cost.
- 30. Which of the following is a **false** statement about scrap and by-products?
 - a. Both by-products and scrap are salable.
 - b. A by-product has a higher sales value than does scrap.
 - c. By-products and scrap are the primary reason that management undertakes the joint process.
 - d. Both scrap and by-products are incidental outputs to the joint process.

- 31. The split-off point is the point at which
 - a. output is first identifiable as individual products.
 - b. joint costs are allocated to joint products.
 - c. some products may first be sold.
 - d. all of the above.
- 32. A product may be processed beyond the split-off point if management believes that
 - a. its marketability will be enhanced.
 - b. the incremental cost of further processing will be less than the incremental revenue of further processing.
 - c. the joint cost assigned to it is not already greater than its prospective selling price.
 - d. both a and b.
- 33. Which of the following would **not** be considered a sunk cost?
 - a. direct material cost
 - b. direct labor cost
 - c. joint cost
 - d. building cost
- 34. The definition of a sunk cost is
 - a. a cost that cannot be recovered regardless of what happens.
 - b. a cost that relates to money poured into the ground.
 - c. considered the original cost of an item.
 - d. also known as an opportunity cost.
- 35. The net realizable value approach mandates that the NRV of the by-products/scrap be treated as
 - a. an increase in joint costs.
 - b. a sunk cost.
 - c. a reduction of joint costs.
 - d. a cost that can be ignored totally.
- 36. The net realizable value approach is normally used when the NRV is expected to be

<u>insignificant</u>		<u>significant</u>	
a.	yes	yes	
b.	no	yes	
c.	no	no	
d.	yes	no	

- 37. Approximated net realizable value at split-off for joint products is computed as
 - a. selling price at split-off minus further processing and disposal costs.
 - b. final selling price minus further processing and disposal costs.
 - c. selling price at split-off minus allocated joint processing costs.
 - d. final selling price minus a normal profit margin.
- 38. Which of the following is a commonly used joint cost allocation method?
 - a. high-low method

- b. regression analysis
- c. approximated sales value at split-off method
- d. weighted average quantity technique
- 39. Incremental separate costs are defined as all costs incurred between _____ and the point of sale.
 - a. inception
 - b. split-off point
 - c. transfer to finished goods inventory
 - d. point of addition of disposal costs
- 40. All costs that are incurred between the split-off point and the point of sale are known as
 - a. sunk costs.
 - b. incremental separate costs.
 - c. joint cost.
 - d. committed costs.
- 41. Incremental revenues and costs need to be considered when using which allocation method?

<u>Physical measures</u> <u>Sales value at split-off</u>

a.	yes	yes
b.	yes	no
C.	no	no
d.	no	yes

- 42. The method of pricing by-products/scrap where no value is assigned to these items until they are sold is known as the
 - a. net realizable value at split-off point method.
 - b. sales value at split-off method.
 - c. realized value approach.
 - d. approximated net realizable value at split-off method.
- 43. Relative sales value at split-off is used to allocate

costs beyond split-off	<u>joint costs</u>
------------------------	--------------------

a.	yes	yes
b.	yes	no
c.	no	yes
d.	no	no

- 44. For purposes of allocating joint costs to joint products using the relative sales value at split-off method, the costs beyond split-off
 - a. are allocated in the same manner as the joint costs.
 - b. are deducted from the relative sales value at split-off.
 - c. are deducted from the sales value at the point of sale.
 - d. do not affect the allocation of the joint costs.
- 45. Not-for-profit organizations are required by the ______ to allocate joint costs.

- a. AICPA
- b. FASB
- c. CASB
- d. GASB

True or False.

Write T if the statement is true otherwise, Write F.

- 1. Joint costs occur after the split-off point in a production process
- 2. Joint costs occur before the split-off point in a production process
- 3. Joint costs are allocated to by-products as well as primary products.
- 4. The primary distinction between by-products and scrap is the difference in sales value.
- 5. The primary distinction between by-products and scrap is the difference in volume produced.
- 6. The point at which individual products are first identifiable in a joint process is referred to as the split-off point
- 7. Joint costs include all materials, labor and overhead that are incurred before the split-off point.
- 8. Two methods of allocating joint costs to products are physical measure allocation and monetary allocation.
- 9. A decision that must be made at split-off is to sell a product or process it further.
- 10. Allocating joint costs based upon a physical measure ignores the revenue-generating ability of individual products.
- 11. Allocating joint costs based upon a physical measure considers the revenue-generating ability of individual products.
- 12. Monetary allocation measures recognize the revenue generating ability of each product in a joint process.
- 13. The relative sales value method requires a common physical unit for measuring the output of each product.
- 14. Joint costs are allocated to main products, but not to by-products
- 15. Net realizable value equals product sales revenue at split-off plus any costs necessary to prepare and dispose of the product.
- 16. Net realizable value equals product sales revenue at split-off minus any costs necessary to prepare and dispose of the product.
- 17. If incremental revenues beyond split-off are less than incremental costs, a product should be sold at the split-off point.
- 18. If incremental revenues beyond split-off exceed incremental costs, a product should be processed further.
- 19. The net realizable value approach requires that the net realizable value of by-products and scrap be treated as a reduction in joint costs allocated to primary products.
- 20. Net realizable value is considered to be the best measure of the expected contribution of each product to the coverage of joint costs.
- 21. The net realizable value approach is used to account for scrap and by-products when the net realizable value is insignificant.
- 22. The net realizable value approach is used to account for scrap and by-products when the net realizable value is significant.
- 23. Under the realized value approach, no value is recognized for by-products or scrap until they are actually sold.
- 24. Under the net realizable value approach, no value is recognized for by-products or scrap until they are actually sold.

25. Not-for-profit entities are required to allocate joint costs among fund-raising, program, and administrative functions.

II. Problems

Problem I

Mercury Corporation allocates joint costs by using the net-realizable-value method. In the company's Michigan plant, products D and E emerge from a joint process that costs P 250,000. E is then processed at a cost of P 220,000 into products F and G. Data pertaining to D, F, and G follow.

	<u>D</u>	<u>F</u>	<u>G</u>
Costs beyond split-off	P50,000	P27,000	P25,000
Selling price	40	38	50
Pounds produced	10,000	4,000	2,000

Required:

- 1. Allocate the P 220,000 processing cost between products F and G.
- 2. From a profitability perspective, should product E be processed into products F and G?

Problem II

Barry Company manufactures X-111, X-112, and X-113 from a joint process. The following information is available for the period just ended:

	<u>X-111</u>	<u>X-112</u>	<u>X-113</u>	<u>Total</u>
Units produced	6,000	14,000	30,000	50,000
Joint cost allocation	1	P18,400	3	P 80,000
Sales value at split-off	P104,000	2	4	P 260,000

Required:

3. Assume that Barry does <u>not</u> use the physical-units method but instead allocates joint costs by using the relative-sales-value method. Find the four unknowns in the preceding table.

Problem III

Suppose that one hog yields 300 pounds of ham, 200 pounds of chops, and 100 pounds of miscellaneous items. The sales value of ham is \$1.20 per pound; chops, \$1.50 per pound; and miscellaneous items, \$0.90 per pound. The hog costs \$580, and processing costs are \$20.

Required:

- 4. Determine the proper allocation of joint costs to the three products by using the physical-units method.
- 5. Repeat the process by using the relative-sales-value method.

Problem IV

Higgins Corporation manufactures two chemicals (Flextra and Hydro) in a joint process. Data from a recent month follow.

Direct materials used: \$360,000

Direct labor: \$150,000

Manufacturing overhead: \$690,000

Manufacturing output: Flextra: 40,000 gallons Hydro: 120,000 gallons

Flextra sells for \$15 per gallon and Hydro sells for \$20 per gallon.

Required:

- 6. Compute the total joint costs to be allocated to Flextra and Hydro.
- 7. Compute the joint costs that would be allocated to Flextra by using the physical-units method.
- 8. Compute the joint costs that would be allocated to Hydro by using the relative-sales-value method.
- 9. Assume that Hydro can be converted into a more refined product, Hydro-R, in a totally separable process at an additional cost of \$4 per gallon. Hydro-R can be sold in the marketplace for \$26 per gallon.
 - a. Compute the net realizable value of Hydro-R.
 - b. If Higgins allocated \$800,000 of joint cost to Hydro-R and sold 90% of the production completed, determine the cost of remaining Hydro-R that would be transferred to the company's month-end balance sheet as finished-goods inventory.

Problem V

Ohio Chemical manufactures two industrial chemicals in a joint process. In October, direct material costing \$120,000 was processed at a cost of \$300,000, resulting in 16,000 pounds of Pentex and 4,000 pounds of Glaxco. Pentex sells for \$35 per pound and Glaxco sells for \$60 per pound. Management generally processes each of these chemicals further in separable processes to produce more refined products. Pentex is processed separately at a cost of \$7.50 per pound, with the resulting product, Pentex-R, selling for \$45 per pound. Glaxco is processed separately at a cost of \$10 per pound, and the resulting product, Glaxco-R, sells for \$100 per pound.

Required:

- *10. Compute the company's total joint production costs.*
- 11. Assuming that total joint production costs amounted to \$500,000, allocate these costs by using:
 - A. The physical-units method.
 - B. The relative-sales-value method.
 - C. The net-realizable-value method.

Problem VI

Douglas Company, a new firm, manufactures two products, J and K, in a common process. The joint costs amount to \$80,000 per batch of finished goods. Each batch results in 20,000 liters of output, of which 80% are J and 20% are K.

The two products are processed beyond the split-off point, with Douglas incurring the following separable costs: J, \$2 per liter; K, \$5 per liter. After the additional processing, the selling price of J is \$12 per liter, and the selling price of K is \$15 per liter.

Required:

- 12. Determine the proper allocation of joint costs if the company uses the net-realizable-value method.
- 13. Assume that Douglas sold all of its production of K during the current accounting period. Compute K's sales revenue, cost of goods sold, and gross margin.

Problem VII

Ratcliff Company produces two products from a joint process: X and Z. Joint processing costs for this production cycle are \$8,000.

			Disposal			
		Sales price	cost per	Further	Final sale	
		per yard at	yard at	processing	price per	
	<u>Yards</u>	<u>split-off</u>	<u>split-off</u>	<u>per yard</u>	<u>yard</u>	
X	1,500	\$6.00	\$3.50	\$1.00	\$ 7.50	
Z	2,200	9.00	5.00	3.00	11.25	

If X and Z are processed further, no disposal costs will be incurred or such costs will be borne by the buyer.

- 14. Using a physical measure, what amount of joint processing cost is allocated to X (round to the nearest dollar)?
- 15. Using a physical measure, what amount of joint processing cost is allocated to Z (round to the nearest dollar)?
- 16. Using sales value at split-off, what amount of joint processing cost is allocated to X (round to the nearest dollar)?
- 17. Using sales value at split-off, what amount of joint processing cost is allocated to Z (round to the nearest dollar)?
- 18. Using net realizable value at split-off, what amount of joint processing cost is allocated to *X* (round to the nearest dollar)?
- 19. Using net realizable value at split-off, what amount of joint processing cost is allocated to Z (round to the nearest dollar)?
- 20. Using approximated net realizable value at split-off, what amount of joint processing cost is allocated to X (round to the nearest dollar)?
- 21. Using approximated net realizable value at split-off, what amount of joint processing cost is allocated to Z (round to the nearest dollar)?
- *22. Which product(s) would be processed further?*

Problem XIII

Gordon Company produces three products: A, B, and C from the same process. Joint costs for this production run are \$2,100.

			Disposal		
		Sales price	cost per	Further	Final
		per lb. at	lb. at	processing	sales price
	<u>Pounds</u>	<u>split-off</u>	<u>split-off</u>	<u>per pound</u>	<u>per pound</u>
A	800	\$6.50	\$3.00	\$2.00	\$ 7.50
В	1,100	8.25	4.20	3.00	10.00
С	1,500	8.00	4.00	3.50	10.50

If the products are processed further, Gordon Company will incur the following disposal costs upon sale: A, \$3.00; B, \$2.00; and C, \$1.00.

- 23. Using a physical measurement method, what amount of joint processing cost is allocated to Product A (round to the nearest dollar)?
- 24. Using a physical measurement method, what amount of joint processing cost is allocated to Product B (round to the nearest dollar)?
- 25. Using sales value at split-off, what amount of joint processing cost is allocated to Product B (round to the nearest dollar)?
- 26. Using sales value at split-off, what amount of joint processing cost is allocated to Product C (round to the nearest dollar)?
- 27. Using net realizable value at split-off, what amount of joint processing cost is allocated to Product A (round to the nearest dollar)?
- 28. Using net realizable value at split-off, what amount of joint processing cost is allocated to Product C (round to the nearest dollar)?

Problem IX

Sabrina Company is placing an ad in the local paper to advertise its products. The ad will run for one week at a total cost of \$5,500. Sabrina Company has four categories of products as follows:

	% of floor space	Expected sales	
	<u>occupied</u>	<u>value</u>	
Hardware	20%	\$35,000	
Hand Tools	15	15,000	
Lawn Furniture	45	64,500	
Light Fixtures	20	25,500	

- 29. What amount of advertising cost should be allocated to hardware, assuming Sabrina allocates based on percent of floor space occupied?
- 30. Assume that Sabrina decides to allocate based on expected sales value. What amount of advertising cost should be allocated to light fixtures (round to the nearest dollar)?

Problem XI

Whalen Company manufactures products X and Y from a joint process that also yields a by-product, Z. Revenue from sales of Z is treated as a reduction of joint costs. Additional information is as follows:

		Products		
	<u>X</u>	<u>Y</u>	<u>Z</u>	<u>Total</u>
Units produced	20,000	20,000	10,000	50,000
Joint costs	?	?	?	\$262,000
Sales value at				
split-off	\$300,000	\$150,000	\$10,000	\$460,000

Joint costs were allocated using the sales value at split-off approach

- *31.* The joint costs allocated to product X were?
- *32. The joint costs allocated to product Y were?*

Problem XII

Tropical Company manufactures three products in a joint process which costs \$25,000. Each product can be sold at split-off or processed further and then sold. 10,000 units of each product are manufactured. The following information is available for the three products:

Product	Sales Value at Split-off	Separable Processing Costs after Split- off	Sales Value at Completion
A	\$12	\$9	\$21
В	10	4	17
С	15	6	19

- 33. If Product A is processed beyond the split-off point, profit will? (answer by increase or decrease by (amount) or no change)
- 34. To maximize profits, which products should Tropical process further?

Problem XIII

Wallace Company produces only two products and incurs joint processing costs that total \$3,750. Products Alpha and Beta are produced in the following quantities during each month: 4,500 and 6,000 gallons, respectively. Wallace Company also runs one ad each month that advertises both products at a cost of \$1,500. The selling price per gallon for the two products are \$20 and \$17.50, respectively.

- 35. What amount of joint processing costs is allocated to each product based on gallons produced?
- 36. What amount of advertising cost is allocated to each product based on sales value?

Problem XIV

Gable Company produces two main products jointly, A and B, and C, which is a by-product of B. A and B are produced form the same raw material. C is manufactured from the residue of the process creating B.

Costs before separation are apportioned between the two main products by the net realizable value method. The net revenue realized from the sale of C is deducted from the cost of B. Data for April were as follows:

Costs before separation Costs after separation:	\$200,000
A	50,000
В	32,000
С	4,000
Production for April, in pounds: A B C	800,000 200,000 20,000
Sales for April:	
A	640,000 pounds @ \$.4375
В	180,000 pounds @ .65

C 20,000 pounds @ .30

37. Determine the gross profit for April.

Problem XV

Leigh Manufacturers produces three products from a common manufacturing process. The total joint cost of producing 2,000 pounds of Product A; 1,000 pounds of Product B; and 1,000 pounds of Product C is \$7,500. Selling price per pound of the three products are \$15 for Product A; \$10 for Product B; and \$5 for Product C. Joint cost is allocated using the sales value method.

Required:

- *38. Compute the unit cost of Product A if all three products are main products.*
- 39. Compute the unit cost of Product A if Products A and B are main products and Product C is a by-product for which the cost reduction method is used.

Problem XVI

McQueen Company processes raw material in Department 1 from which come two main products, A and B, and a by-product, C. A is further processed in Department 2, B in Department 3, and C in Department 4. The value of the by-product reduces the cost of the main products, and sales value is used to allocate joint costs.

	Dept 1	Dept 2	Dept 3	Dept 4
Cost Incurred:	\$90,000	\$10,000	\$8,000	\$10,000
Production:				
A	10,000 lbs.			
В	20,000 lbs.			
С	10,000 lbs.			
Selling Price:				
A	\$10/lb.			
В	\$5/lb.			
С	\$2/lb.			

Required:

- 40. Compute unit costs for A and B.
- 41. Ending inventory consists of 5,000 lbs. of B and 1,000 lbs. of C. What is the value of the inventory?
- 42. Recompute a and b allocating cost based on net realizable value.

~ ~ ~ ~

Suggested Key			
	I. Theories		
Multiple choice	i. Hicones		
1. D	16. D	31. D	
2. A	17. D	32. D	
3. C	18. B	33. D	
4. C	19. A	34. A	
5. E	20. B	35. C	
6. A	21. D	36. B	
7. D	22. C	37. B	
8. E	23. B	38. C	
9. E	24. A	39. B	
10. B	25. D	40. B	
11. A	26. B	41. C	
12. C	27. C	42. C	
13. B	28. B	43. C	
14. D	29. C	44. D	
15. A	30. C	45. A	
True or False			
1. F	10. T	19. T	
2. T 3. F	11. F	20. T	
3. F	12. T	21. F	
4. T	13. F	22. T	
5. F	14. T	23. T	
6. T	15. F	24. F	
7. T	16. T	25. T	
8. T	17. T		
9. T	18. T		
	II. Problems		
1. F - 137,500 ; G - 82,500	15. 4,757	29. 1,100	
2. No	16. 2,500	30. 1,002	
3. 1-32,000 ; 2-59,800 ; 3-29,600 ; 4-96,200	17. 5,500	31. 168,000.	
4. H – 300; C- 200; MI- 100 TOTAL: 600	18. 2,390	32. 84,000	
5. H-288; C-240; MI-72 TOTAL: 600	19. 5,610	33. no change.	
6. 1,200,000	20. 3,090	34. Product C only	
7. 300,000	21. 4,910	35. \$1,607 & \$2,143, respectively.	
8. 960,000	22. only X	36. 692 and 808	
9. A- 2,640,000.	23. 494	37. 165,000	

B- 128,000		
10. 420,000	24. 679	38. 2.50
11. A- Pentex 400,000 Glaxco 100,000 B- Pentex 350,000 Glaxco 150,000 C-Pentex-R 312,500 Glaxco-R 187,500	25. 725	39. \$.9375
12. J - 64,000 K - 16,000	26. 959	40. A 4.50; B 2.15
13. Sales revenue- 60,000 CGS – 36,000 Gross profit – 24,000	27. 444	41. 12,750
14. 3,243	28. 951	42. A- 4.46; B 2.17 El 12,850