

Cost Accounting, 14e (Horngren/Datar/Rajan)

Chapter 16 Cost Allocation: Joint Products and Byproducts

Objective 16.1

1) What type of cost is the result of an event that results in more than one product or service simultaneously?

- A) byproduct cost
- B) joint cost
- C) main cost
- D) separable cost

Answer: B

Diff: 2

Terms: joint costs

Objective: 1

AACSB: Reflective thinking

2) All costs incurred beyond the splitoff point that are assignable to one or more individual products are called:

- A) byproduct costs
- B) joint costs
- C) main costs
- D) separable costs

Answer: D

Diff: 2

Terms: separable costs, splitoff point

Objective: 1

AACSB: Reflective thinking

3) In joint costing:

- A) costs are assigned to individual products as assembly of the product occurs
- B) costs are assigned to individual products as disassembly of the product occurs
- C) a single production process yields two or more products
- D) Both B and C are correct.

Answer: D

Diff: 3

Terms: joint costs

Objective: 1

AACSB: Reflective thinking

4) The _____ point is the juncture in a joint production process when two or more products become separately identifiable.

- A) splitoff
- B) joint product
- C) process
- D) end

Answer: A

Diff: 3

Terms: splitoff point, main products, joint products

Objective: 1

AACSB: Reflective thinking

5) The focus of joint costing is on allocating costs to individual products:

- A) before the splitoff point
- B) after the splitoff point
- C) at the splitoff point
- D) at the end of production

Answer: C

Diff: 3

Terms: joint costs, splitoff point

Objective: 1

AACSB: Reflective thinking

6) When a single manufacturing process yields two products, one of which has a relatively high sales value compared to the other, the two products are respectively known as:

- A) joint products and byproducts
- B) joint products and scrap
- C) main products and byproducts
- D) main products and joint products

Answer: C

Diff: 2

Terms: main products, byproducts

Objective: 1

AACSB: Reflective thinking

7) When a joint production process yields two or more products with high total sales values, these products are called:

- A) main products
- B) joint products
- C) byproducts
- D) scrap

Answer: B

Diff: 2

Terms: joint products

Objective: 1

AACSB: Reflective thinking

8) Byproducts and main products are differentiated by the:

- A) number of units per processing period
- B) weight or volume of outputs per period
- C) amount of total sales value
- D) None of these answers is correct.

Answer: C

Diff: 2

Terms: byproducts, main products

Objective: 1

AACSB: Reflective thinking

9) All of the following changes may indicate a change in product classification of a manufacturing process which has a splitoff point EXCEPT a:

- A) byproduct increases in sales value due to a new application
- B) main product becomes a joint product
- C) main product becomes technologically obsolete
- D) byproduct loses its market due to a new invention

Answer: B

Diff: 2

Terms: splitoff point, main products, joint products

Objective: 1

AACSB: Reflective thinking

10) Which of the following methods of allocating costs use market-based data?

- A) Sales value at splitoff method
- B) Estimated net realizable value method
- C) The constant gross-margin percentage method
- D) All of these answers are correct.

Answer: D

Diff: 1

Terms: sales value at splitoff, NRV, constant gross-margin percentage NRV method

Objective: 1

AACSB: Reflective thinking

11) Products with a relatively low sales value are known as:

- A) scrap
- B) main products
- C) joint products
- D) byproducts

Answer: D

Diff: 1

Terms: byproducts

Objective: 1

AACSB: Reflective thinking

12) Which of the following statements is true regarding main products and byproducts?

- A) Product classifications do not change over the short run.
- B) Product classifications do not change over the long run.
- C) Product classifications may change over time.
- D) The cause-and-effect criterion determines the classification.

Answer: C

Diff: 3

Terms: main products, byproducts

Objective: 1

AACSB: Reflective thinking

13) Outputs with zero sales value are accounted for by:

- A) listing these various outputs in a footnote to the financial statements
- B) including the items as a relatively small portion of the value assigned to the products produced during the accounting period
- C) making journal entries to reflect an estimate of possible values
- D) None of these answers is correct.

Answer: D

Diff: 3

Terms: byproducts

Objective: 1

AACSB: Reflective thinking

14) Outputs with a negative sales value are:

- A) added to cost of goods sold
- B) added to joint production costs and allocated to joint or main products
- C) added to joint production costs and allocated to byproducts and scrap
- D) subtracted from product revenue

Answer: B

Diff: 3

Terms: main products, byproducts

Objective: 1

AACSB: Reflective thinking

15) Joint costs are incurred beyond the splitoff point and are assignable to individual products.

Answer: FALSE

Explanation: Joint costs are incurred prior to the splitoff.

Diff: 2

Terms: joint costs, splitoff point

Objective: 1

AACSB: Reflective thinking

16) Separable costs are incurred beyond the splitoff point that are assignable to each of the specific products identified at the splitoff point.

Answer: TRUE

Diff: 2

Terms: separable costs, splitoff point

Objective: 1

AACSB: Reflective thinking

17) Separable costs include manufacturing costs only.

Answer: FALSE

Explanation: Separable costs include manufacturing, marketing, distribution, and other costs.

Diff: 2

Terms: separable costs, splitoff point

Objective: 1

AACSB: Reflective thinking

18) The focus of joint costing is assigning costs to individual products as assembly occurs.

Answer: FALSE

Explanation: The focus is accumulating costs incurred on the joint products.

Diff: 2

Terms: joint costs

Objective: 1

AACSB: Reflective thinking

19) Joint costs are the costs of a production process that yields multiple products simultaneously.

Answer: TRUE

Diff: 1

Terms: joint costs

Objective: 1

AACSB: Reflective thinking

20) The juncture in a joint production process when two products become separable is the byproduct point.

Answer: FALSE

Explanation: The juncture in a joint production process when two products become separable is the splitoff point.

Diff: 1

Terms: byproducts, splitoff point

Objective: 1

AACSB: Reflective thinking

21) At or beyond the splitoff point, decisions relating to the sale or further processing of each identifiable product can be made independently of decisions about the other products.

Answer: TRUE

Diff: 1

Terms: splitoff point, main products, joint products

Objective: 1

AACSB: Reflective thinking

22) The products of a joint production process that have low total sales values compared with the total sales value of the main product are called joint products.

Answer: FALSE

Explanation: They are called byproducts.

Diff: 1

Terms: byproducts, joint products

Objective: 1

AACSB: Reflective thinking

23) The products of a joint production process that have low total sales values compared with the total sales value of the main product or of joint products are called byproducts.

Answer: TRUE

Diff: 2

Terms: byproducts

Objective: 1

AACSB: Reflective thinking

24) All products yielded from joint product processing have some positive value to the firm.

Answer: FALSE

Explanation: Not all products yielded from joint product processing have some positive value to the firm.

Diff: 1

Terms: byproducts, joint products

Objective: 1

AACSB: Reflective thinking

25) If the value of a joint product drops significantly, it could also be viewed as a byproduct

Answer: TRUE

Diff: 1

Terms: byproducts, joint products

Objective: 1

AACSB: Reflective thinking

26) In each of the following industries, identify possible joint (or severable) products at the splitoff point.

- a. Coal
- b. Petroleum
- c. Dairy
- d. Lamb
- e. Lumber
- f. Cocoa Beans
- g. Christmas Trees
- h. Salt
- i. Cowhide

Answer:

- a. Coke, Gas, Benzole, Tar, Ammonia
- b. Crude Oil, Gas, Raw LPG
- c. Milk, Butter, Cheese, Ice Cream, Skim Milk
- d. Lamb Cuts, Tripe, Hides, Bones, Fat
- e. Board, Newsprint, Shavings, Chips, etc.
- f. Cocoa Butter, Cocoa Powder, Cocoa Shells
- g. Christmas Trees, Wreaths, Decorations
- h. Hydrogen, Chlorine, Caustic Soda
- i. Leather, Suede, Chew Toys

Diff: 1

Terms: joint products, splitoff point

Objective: 1

AACSB: Analytical skills

27) Define the terms main product, joint product, and byproduct. Give at least one example of each type of product.

Answer: Main product - When one product has a high total sales value compared with the total sales value of other products of the process. Ex. timber processed into lumber

Joint product - When a joint production process yields two or more products with high total sales value compared with the total sales value of other products. Ex. crude oil processed into gasoline and kerosene

Byproduct - Products of a joint production process that have low total sales value compared with the total sales value of the main product or joint products. Ex. woodchips created when timber processed into lumber

Diff: 1

Terms: main products, byproducts

Objective: 1

AACSB: Reflective thinking

28) Silver Company uses one raw material, silver ore, for all of its products. It spends considerable time getting the silver from the ore before it starts the actual processing of the finished products, rings, lockets, etc. Traditionally, the company made one product at a time and charged the product with all costs of production, from ore to final inspection. However, in recent months, the cost accounting reports have been somewhat disturbing to management. It seems that some of the finished products are costing more than they should, even to the point of approaching their retail value. It has been noted by the accounting manager that this problem began when the company started buying ore from different parts of the world, some of which require difficult extraction methods.

Required:

Can you explain how the company might change its accounting system to reflect the reporting problems better? Are there other problems with the purchasing area?

Answer: It appears that the company needs to start assigning all extraction costs to a joint-cost category. It is unfair that the finished products receive a high cost simply because a certain batch of ore was very expensive to run through the extraction process when the next finished products were produced from silver that was easy to extract.

If all extraction costs are considered joint, then each finished product would share in the average cost of extraction, rather than being charged with the cost of a specific batch. This should result in costs that are more reflective of the product's actual cost.

Additional problems may be with the purchasing department. The accounting department may help highlight the problem but it does not pinpoint the actual problem. Maybe the company should buy refined silver or else hire experts in the minerals area as part of the purchasing team.

Diff: 2

Terms: joint costs

Objective: 1

AACSB: Reflective thinking

29) What are a joint cost and a splitoff point?

Answer: A joint cost is the cost of a single production process that yields multiple products simultaneously. The splitoff point is the juncture in a joint production process when the products become separately identifiable.

Diff: 2

Terms: joint costs, splitoff point

Objective: 1

AACSB: Reflective thinking

30) Explain the difference between a joint product and a byproduct. Can a byproduct ever become a joint product?

Answer: The differentiating factor between a joint product and a byproduct is the sales value at the splitoff point. Joint products have high total sales value at the splitoff point. A byproduct has a low total sales value at the splitoff point. Products can change from byproducts to joint products when their total sales values increase significantly.

Diff: 2

Terms: byproducts, joint products, splitoff point

Objective: 1

AACSB: Reflective thinking

Objective 16.2

1) Which of the following is a reason to allocate joint costs?

- A) rate regulation requirements, if applicable
- B) cost of goods sold computations
- C) insurance settlement cost information requirements
- D) All of these answers are correct.

Answer: D

Diff: 1

Terms: joint costs

Objective: 2

AACSB: Reflective thinking

2) A business which enters into a contract to purchase a product (or products) and will compensate the manufacturer under a cost reimbursement formula, should take an active part in the determination of how joint costs are allocated because:

- A) the manufacturer will attempt to allocate as large a portion of its costs to these products
- B) if the manufacturer successfully allocates a large portion of its costs to these products then it will be able to sell its other nonreimbursed products at lower prices
- C) the FASB requires the business to participate in the cost allocation process
- D) Both A and B are correct.

Answer: D

Diff: 3

Terms: joint costs

Objective: 2

AACSB: Reflective thinking

3) Proper costs allocation for inventory costing and cost-of-goods-sold computations are important because:

- A) inventory costing is essential for proper balance sheet presentation
- B) most states have laws requiring proper balance sheet presentation and recommended allocation methods
- C) cost of goods sold is an important component in the determination of net income
- D) Both A and C are correct.

Answer: D

Diff: 3

Terms: joint costs

Objective: 2

AACSB: Reflective thinking

4) Which of the following is NOT a primary reason for allocating joint costs?

- A) cost justification and insurance settlement cost information requirements
- B) cost justification and asset measurement
- C) income measurement and rate regulation requirements
- D) to calculate the bonus of the chief executive officer

Answer: D

Diff: 1

Terms: joint costs

Objective: 2

AACSB: Reflective thinking

5) Joint costs are NOT allocated to individual products for the preparation of tax returns.

Answer: FALSE

Explanation: Joint costs are allocated for reporting to tax authorities.

Diff: 1

Terms: joint costs

Objective: 2

AACSB: Reflective thinking

6) Litigation may be a reason that joint costs are allocated to individual products.

Answer: TRUE

Diff: 1

Terms: joint costs

Objective: 2

AACSB: Reflective thinking

7) List three reasons why we allocate joint costs to individual products or services. Give an example of when the particular cost allocation reason would come into use.

Answer:

a. *For inventory costing, and cost of goods sold computations for financial accounting purposes.*

Example: Cost of goods sold and ending inventory valuation is necessary for reports to shareholders and for the inland revenue service.

b. *For internal costing and cost of goods sold computations for internal reporting purposes.*

Example: These computations are necessary for division profitability analysis.

c. *Reimbursement under contracts.*

Example: A firm produces multiple products or services-and uses the same resources and facilities to produce the products or services. But not all the firm's products are under the contract. The firm must allocate the cost of these shared facilities or resources to reflect the portion used by the product under the contract.

d. *Insurance settlement computations.*

Example: Where a business with multiple products or services claim losses under an insurance policy and wants to calculate the loss. The insurance company and the insured must agree on the value of the loss.

e. *Rate regulation.* When companies are subject to rate regulation, the allocation of joint costs can be a significant factor in determining the regulated rates.

Example: Crude oil and natural gas are produced out of a common well.

Diff: 1

Terms: joint costs

Objective: 2

AACSB: Reflective thinking

8) What are six reasons that joint costs should be allocated to individual products or services?

Answer: The first reason joint costs should be allocated to compute inventoriable costs and cost of goods sold is for financial accounting purposes and for income tax reporting. The second reason the costs should be allocated to also allow for computing cost of goods sold and inventoriable costs for internal reporting purposes to compute division profits and to evaluate division managers. The third reason that joint costs need to be allocated is so that costs will be reimbursed under contracts using a cost plus system, often found in government contracts. A fourth reason for the cost allocation is to allow for proper valuation and settlement in insurance claims for damages. A fifth reason is that joint products may be regulated and proper costing is essential. The sixth reason for allocating joint costs is to support litigation where the joint product is a key input.

Diff: 2

Terms: joint costs

Objective: 2

AACSB: Reflective thinking

Objective 16.3

1) All of the following methods may be used to allocate joint costs EXCEPT the:

- A) constant gross-margin percentage method
- B) estimated net realizable value method
- C) present value allocation method
- D) sales value at splitoff method

Answer: C

Diff: 2

Terms: joint costs, constant gross-margin % NRV, NRV, and sales value at splitoff method

Objective: 3

AACSB: Reflective thinking

2) An example of a market-based approach to allocating joint costs is (are) allocating joint costs based on:

- A) sales value at splitoff method
- B) physical volume
- C) constant gross-margin percentage method
- D) Both A and C are correct.

Answer: D

Diff: 3

Terms: sales value at splitoff, constant gross-margin percentage NRV method

Objective: 3

AACSB: Reflective thinking

3) Which of the following is NOT a market-based approach to allocating costs?

- A) sales value at splitoff
- B) constant gross-margin percentage NRV
- C) physical measures
- D) net realizable value

Answer: C

Diff: 3

Terms: sales value at splitoff, NRV, constant gross-margin % NRV, physical-measure method

Objective: 3

AACSB: Reflective thinking

4) The sales value at splitoff method:

- A) allocates joint costs to joint products on the basis of the relative total sales value at the splitoff point
- B) allocates joint costs to joint products on the basis of a comparable physical measure at the splitoff point
- C) allocates joint costs to joint products on the basis of relative NRV
- D) allocates joint costs to joint products in a way that each product has an identical gross-margin percentage

Answer: A

Diff: 3

Terms: sales value at splitoff method

Objective: 3

AACSB: Reflective thinking

5) The physical-measure method:

- A) allocates joint costs to joint products in a way that each product has an identical gross-margin percentage
- B) allocates joint costs to joint products on the basis of a comparable physical measure at the splitoff point
- C) allocates joint costs to joint products on the basis of the relative sales value at the splitoff point
- D) allocates joint costs to joint products on the basis of relative NRV

Answer: B

Diff: 3

Terms: physical-measure method

Objective: 3

AACSB: Reflective thinking

6) The net realizable value method:

- A) allocates joint costs to joint products on the basis of a comparable physical measure at the splitoff point
- B) allocates joint costs to joint products on the basis of the relative sales value at the splitoff point
- C) allocates joint costs to joint products in a way that each product has an identical gross-margin percentage
- D) allocates joint costs to joint products on the basis of relative NRV

Answer: D

Diff: 3

Terms: net-realizable value (NRV) method

Objective: 3

AACSB: Reflective thinking

7) Which of the following statements is true in regard to the cause-and-effect relationship between allocated joint costs and individual products?

- A) A high individual product value results in a high level of joint costs.
- B) A low individual product value results in a low level of joint costs.
- C) A high individual product value results in a low level of joint costs.
- D) There is no cause-and-effect relationship.

Answer: D

Diff: 3

Terms: joint costs

Objective: 3

AACSB: Reflective thinking

8) The benefits-received criteria for allocating joint costs indicate market-based measures are preferred because:

- A) physical measures such as volume are a clearer basis for allocating cost than other measures
- B) other measures are more difficult to calculate
- C) revenues are usually the best indicator of the benefits received
- D) None of these answers is correct.

Answer: C

Diff: 1

Terms: joint costs

Objective: 3

AACSB: Reflective thinking

Answer the following questions using the information below:

Yakima Manufacturing purchases trees from Cheney Lumber and processes them up to the splitoff point where two products (paper and pencil casings) are obtained. The products are then sold to an independent company that markets and distributes them to retail outlets. The following information was collected for the month of November:

Trees processed: 100 trees (yield is 60,000 sheets of paper and 60,000 pencil casings and no scrap)

Production:

paper	60,000 sheets
pencil casings	60,000

Sales:

paper	58,000 at \$0.04 per page
pencil casings	60,000 at \$0.10 per casing

The cost of purchasing 100 trees and processing them up to the splitoff point to yield 60,000 sheets of paper and 60,000 pencil casings is \$3,000.

Yakima's accounting department reported no beginning inventories and an ending inventory of 2,000 sheets of paper.

9) What is the sales value at the splitoff point for paper?

- A) \$240
- B) \$2,320
- C) \$2,400
- D) \$3,900

Answer: C

Explanation: C) Paper: 60,000 sheets \times \$0.04 = \$2,400.00

Diff: 2

Terms: sales value at splitoff method, splitoff point

Objective: 3

AACSB: Analytical skills

10) What is the sales value at the splitoff point of the pencil casings?

- A) \$600
- B) \$2,460
- C) \$6,000
- D) \$7,500

Answer: C

Explanation: C) Pencils: 60,000 casings \times \$0.10 = \$6,000.00

Diff: 1

Terms: sales value at splitoff method, splitoff point

Objective: 3

AACSB: Analytical skills

11) If the sales value at splitoff method is used, what are the approximate joint costs assigned to ending inventory for paper?

- A) \$28.58
- B) \$100.00
- C) \$870.00
- D) \$1,500.00

Answer: A

Explanation:

A) Paper: 60,000 sheets \times \$0.04 = \$2,400.00

$$2,400/(\$2,400 + \$6,000) = 28.57\%$$

$$28.57\% \times \$3,000 \times 2,000/60,000 = \$28.58$$

Diff: 3

Terms: sales value at splitoff method, splitoff point

Objective: 3

AACSB: Analytical skills

12) If the sales value at splitoff method is used, what is the approximate production cost for each pencil casing?

- A) \$0.0250
- B) \$0.0255
- C) \$0.0335
- D) \$0.0357

Answer: D

Explanation:

D) Paper: 60,000 sheets \times \$0.04 = \$2,400.00

$$\$6,000/(\$2,400 + \$6,000) \times \$3,000 = \$2,142$$

$$\$2,142/60,000 \text{ casings} = \$0.0357$$

Diff: 3

Terms: sales value at splitoff method, splitoff point

Objective: 3

AACSB: Analytical skills

13) Yakima Manufacturing purchases trees from Cheney Lumber and processes them up to the splitoff point where two products (paper and pencil casings) are obtained. The products are then sold to an independent company that markets and distributes them to retail outlets. The following information was collected for the month of May:

Trees processed: 100 trees (yield is 70,000 sheets of paper and 60,000 pencil casings and no scrap)

Production:

paper	70,000 sheets
pencil casings	60,000

Sales:

paper	68,000 at \$0.04 per page
pencil casings	60,000 at \$0.10 per casing

The cost of purchasing 100 trees and processing them up to the splitoff point to yield 70,000 sheets of paper and 60,000 pencil casings is \$3,000.

Yakima's Manufacturing's accounting department reported no beginning inventories and an ending inventory of 2,000 sheets of paper.

What are the paper's and the pencils' approximate weighted cost proportions using the sales value at splitoff method, respectively?

- A) 50.00% and 50.00%
- B) 33.33% and 66.67%
- C) 31.82% and 68.18%
- D) None of these answers is correct.

Answer: C

Explanation:

$$C) (70,000 \times \$0.04) + (60,000 \times \$0.10) = \$8,800$$

$$\$2,800/\$8,800 = 31.82\%$$

$$\$6,000/\$8,800 = 68.18\%$$

Diff: 2

Terms: sales value at splitoff method, splitoff point

Objective: 3

AACSB: Analytical skills

14) The Arvid Corporation manufactures widgets, gizmos, and turnbols from a joint process. May production is 2,000 widgets; 3,500 gizmos; and 4,000 turnbols. Respective per unit selling prices at splitoff are \$30, \$20, and \$10. Joint costs up to the splitoff point are \$75,000. If joint costs are allocated based upon the sales value at splitoff, what amount of joint costs will be allocated to the widgets?

- A) \$30,882
- B) \$26,471
- C) \$17,647
- D) \$28,125

Answer: B

Explanation:

$$\begin{array}{rcl} \text{B) } \$30 \times 2,000 & = & \$60,000 \\ \$20 \times 3,500 & = & \$70,000 \\ \$10 \times 4,000 & = & \underline{\$40,000} \\ \text{Total} & = & \underline{\$170,000} \end{array}$$

$$\$60,000 / \$170,000 \times \$75,000 = \$26,471$$

Diff: 2

Terms: sales value at splitoff method, splitoff point

Objective: 3

AACSB: Analytical skills

15) Product X is sold for \$32 a unit and Product Y is sold for \$48 a unit. Each product can also be sold at the splitoff point. Product X can be sold for \$10 and Product Y for \$8. Joint costs for the two products totaled \$2,000 for January for 300 units of X and 250 units of Y. What are the respective joint costs assigned each unit of products X and Y if the sales value at splitoff method is used?

- A) \$2.96 and \$4.44
- B) \$4.00 and \$4.55
- C) \$4.00 and \$3.20
- D) \$4.55 and \$4.55

Answer: C

Explanation:

$$\text{C) Total splitoff market value} = (300 \times \$10) + (250 \times \$8) = \$5,000$$

$$\text{Product X} = \$3,000 / \$5,000 \times \$2,000 = \$1,200 / 300 = \$4.00$$

$$\text{Product Y} = \$2,000 / \$5,000 \times \$2,000 = \$800 / 250 = \$3.20$$

Diff: 2

Terms: sales value at splitoff method, splitoff point

Objective: 3

AACSB: Analytical skills

16) A reason why a physical-measure to allocate joint costs is less preferred than the sales value at splitoff is:

- A) a physical measure such as volume is difficult to estimate because of shrinkage
- B) physical volume usually has little relationship to the revenue producing power of products
- C) a physical measure usually results in the costs being allocated to the product that weighs the most
- D) All of these answers are correct.

Answer: D

Diff: 2

Terms: physical-measure method, sales value at splitoff method

Objective: 3

AACSB: Reflective thinking

Answer the following questions using the information below:

The Oxnard Corporation processes a liquid component up to the splitoff point where two products, Mr. DirtOut and Mr. SinkClean, are produced and sold. There was no beginning inventory. The following material was collected for the month of January:

Direct materials processed: 250,000 gallons (242,500 gallons of good product)

Production: Mr. DirtOut 147,500 gallons
Mr. SinkClean 95,000 gallons

Sales: Mr. DirtOut 140,500 at \$110 per gallon
Mr. SinkClean 91,000 at \$ 100 per gallon

The cost of purchasing 250,000 gallons of direct materials and processing it up to the splitoff point to yield a total of 242,500 gallons of good product was \$760,000.

17) What are the physical-volume proportions to allocate joint costs for Mr. DirtOut and Mr. SinkClean, respectively?

- A) 59.00% and 41.00%
- B) 60.82% and 39.18%
- C) 39.18% and 60.82%
- D) 59.79% and 40.21%

Answer: B

Explanation:

B) Mr. DirtOut: $147,500/242,500 = 60.82\%$

Mr. SinkClean: $95,000/242,500 = 39.18\%$

Diff: 2

Terms: physical-measure method

Objective: 3

AACSB: Analytical skills

18) When using a physical-volume measure, what is the approximate amount of joint costs that will be allocated to Mr. DirtOut and Mr. SinkClean?

- A) \$464,232 and \$297,768
- B) \$448,400 and \$311,600
- C) \$454,404 and \$305,596
- D) \$461,252 and \$298,748

Answer: A

Explanation:

A) $\$760,000 \times (147,500 / 242,500) = \$464,232$; $\$760,000 \times (95,000 / 242,500) = \$297,768$

Diff: 2

Terms: physical-measure method

Objective: 3

AACSB: Analytical skills

19) When using the physical-volume method, what is Mr. DirtOut's approximate production cost per unit?

- A) \$3.02
- B) \$3.08
- C) \$3.14
- D) \$3.22

Answer: C

Explanation: C) $[\$760,000 \times (147,500 / 242,500)] / 147,500 = \3.14

Diff: 3

Terms: physical-measure method

Objective: 3

AACSB: Analytical skills

20) Argon Manufacturing Company processes direct materials up to the splitoff point where two products (U and V) are obtained and sold. The following information was collected for last quarter of the calendar year:

Direct materials processed: 20,000 gallons (20,000 gallons yield 19,000 gallons of good product and 1,000 gallons of shrinkage)

Production:

U	10,000 gallons
V	9,000 gallons

Sales:

U	9,500 at \$150 per gallon
V	8,000 at \$100 per gallon

The cost of purchasing 20,000 gallons of direct materials and processing it up to the splitoff point to yield a total of 19,000 gallons of good products was \$1,950,000.

Beginning inventories totaled 100 gallons for U and 50 gallons for V. Ending inventory amounts reflected 600 gallons of Product U and 1,050 gallons of Product V. October costs per unit were the same as November.

What are the physical-volume proportions for products U and V, respectively?

- A) 47.37% and 53.63%
- B) 55.00% and 45.00%
- C) 52.63% and 47.37%
- D) 54.00% and 46.00%

Answer: C

Explanation: C) X: $10,000 / (10,000 + 9,000) = 52.63\%$

Y: $9,000 / (10,000 + 9,000) = 47.37\%$

Diff: 3

Terms: physical-measure method

Objective: 3

AACSB: Analytical skills

Answer the following questions using the information below:

The Gows Company processes unprocessed goat milk up to the splitoff point where two products, condensed goat milk and skim goat milk result. The following information was collected for the month of October:

Direct Materials processed: 130,000 gallons (shrinkage was 10%)

Production:

condensed goat milk	52,200 gallons
skim goat milk	64,800 gallons

Sales:

condensed goat milk	\$3.50 per gallon
skim goat milk	\$2.50 per gallon

The costs of purchasing the 130,000 gallons of unprocessed goat milk and processing it up to the splitoff point to yield a total of 117,000 gallons of salable product was \$144,480. There were no inventory balances of either product.

Condensed goat milk may be processed further to yield 39,000 gallons (the remainder is shrinkage) of a medicinal milk product, Xyla, for an additional processing cost of \$3 per usable gallon. Xyla can be sold for \$18 per gallon.

Skim goat milk can be processed further to yield 56,200 gallons of skim goat ice cream, for an additional processing cost per usable gallon of \$2.50. The product can be sold for \$9 per gallon.

There are no beginning and ending inventory balances.

21) What is the estimated net realizable value of Xyla at the splitoff point?

- A) \$365,300
- B) \$505,800
- C) \$585,000
- D) \$702,000

Answer: C

Explanation: C)

	XYLA	Skim Goat	Total
Sales	$39,000 \times \$18 =$ \$702,000	$56,200 \times \$9 =$ \$505,800	\$1,207,800
Less: Sep cost	$39,000 \times \$3 =$ \$117,000	$56,200 \times \$2.50 =$ \$140,500	
Est. NR Value	<u>\$585,000</u>	<u>\$365,300</u>	\$950,300
Weighting	.6156	.3844	
Jt costs allocated	$\$144,480 \times .6156 =$ \$88,942	$\$144,480 \times .3844 =$ \$55,538	

Diff: 3

Terms: net-realizable value (NRV) method

Objective: 3

AACSB: Analytical skills

22) What is the estimated net realizable value of the skim goat ice cream at the splitoff point?

- A) \$365,300
- B) \$505,800
- C) \$220,400
- D) \$170,900

Answer: A

Explanation: A)

	XYLA	Skim Goat	Total
Sales	$39,000 \times \$18 =$ \$702,000	$56,200 \times \$9 =$ \$505,800	\$1,207,800
Less: Sep cost	$39,000 \times \$3 =$ \$117,000	$56,200 \times \$2.50 =$ \$140,500	
Est. NR Value	<u>\$585,000</u>	<u>\$365,300</u>	\$950,300
Weighting	.6156	.3844	
Joint costs allocated	$\$144,480 \times .6156 =$ \$88,942	$\$144,480 \times .3844 =$ \$55,538	

Diff: 3

Terms: net-realizable value (NRV) method

Objective: 3

AACSB: Analytical skills

23) Using estimated net realizable value, what amount of the \$72,240 of joint costs would be allocated Xyla and the skim goat ice cream?

- A) \$83,942 and \$60,538
- B) \$88,942 and \$55,538
- C) \$65,592 and \$78,888
- D) \$144,480 and \$72,140

Answer: B

Explanation: B)

	XYLA	Skim Goat	Total
Sales	$39,000 \times \$18 =$ \$702,000	$56,200 \times \$9 =$ \$505,800	\$1,207,800
Less: Sep cost	$39,000 \times \$3 =$ \$117,000	$56,200 \times \$2.50 =$ \$140,500	
Est. NR Value	<u>\$585,000</u>	<u>\$365,300</u>	\$950,300
Weighting	.6156	.3844	
Joint costs allocated	$\$144,480 \times .6156 =$ \$88,942	$\$144,480 \times .3844 =$ \$55,538	

Diff: 3

Terms: net-realizable value (NRV) method

Objective: 3

AACSB: Analytical skills

24) Using the sales value at splitoff method, what is the gross-margin percentage for condensed goat milk at the splitoff point?

- A) 21.1%
- B) 55.1%
- C) 58.1%
- D) 38.2%

Answer: C

Explanation: C)

	Condensed Goat Milk	Skim Goat Milk	Total
Revenues	$52,200 \times \$3.50 =$ \$182,700	$64,800 \times \$2.50 =$ \$162,000	\$344,700
Percentage	$\$182,700/\$344,700 =$ 0.53	$\$162,000/\$344,700 =$ 0.47	
Separable costs	$\$144,480 \times .53 =$ \$76,574	$\$144,480 \times .47 =$ \$67,906	
Gross margin	\$106,126	\$94,094	
GM percentage	$\$106,126/\$182,700 =$ 0.581	$\$94,094/\$162,000 =$ 0.581	

Diff: 3

Terms: sales value at splitoff method, splitoff point

Objective: 3

AACSB: Analytical skills

25) Using the sales value at splitoff method, what is the gross-margin percentage for skim goat milk at the splitoff point?

- A) 21.1%
- B) 55.1%
- C) 58.1%
- D) 38.2%

Answer: C

Explanation: C)

	Condensed Goat Milk	Skim Goat Milk	Total
Revenues	$52,200 \times \$3.50 =$ \$182,700	$64,800 \times \$2.50 =$ \$162,000	\$344,700
Percentage	$\$182,700/\$344,700 =$ 0.53	$\$162,000/\$344,700 =$ 0.47	
Separable costs	$\$144,480 \times .53 =$ \$76,574	$\$144,480 \times .47 =$ \$67,906	
Gross margin	\$106,126	\$94,094	
GM percentage	$\$106,126/\$182,700 =$ 0.581	$\$94,094/\$162,000 =$ 0.581	

Diff: 3

Terms: sales value at splitoff method, splitoff point

Objective: 3

AACSB: Analytical skills

26) How much (if any) extra income would Morton earn if it produced and sold all of the Xyla from the condensed goat milk? Allocate joint processing costs based upon relative sales value on the splitoff.

(Extra income means income in excess of what Morton would have earned from selling condensed goat milk.)

A) \$106,126

B) \$508,426

C) \$402,300

D) \$193,574

Answer: C

Explanation: C)

	Condensed Goat Milk	Skim Goat Milk
Revenue	\$702,000	\$505,800
Joint costs (see #55)	(76,574)	(67,906)
Process costs	$(\$3 \times 39,000) =$ <u>(117,000)</u>	$(\$2.50 \times 56,20000) =$ <u>(140,500)</u>
Revenue (net)	508,426	297,394
Gross margin (see #55)	(106,126)	(94,094)
Difference	<u>\$402,300</u>	<u>\$203,300</u>

Diff: 3

Terms: sales value at splitoff method, splitoff point

Objective: 3

AACSB: Analytical skills

27) How much (if any) extra income would Morton earn if it produced and sold skim milk ice cream from goats rather than goat skim milk? Allocate joint processing costs based upon the relative sales value at the splitoff point.

A) \$94,094

B) \$234,594

C) \$203,300

D) \$140,500

Answer: C

Explanation: C)

	Condensed Goat Milk	Skim Goat Milk
Revenue	\$702,000	\$505,800
Joint costs (see #55)	(76,574)	(67,906)
Process costs	$(\$3 \times 39,000) =$ <u>(117,000)</u>	$(\$2.50 \times 56,20000) =$ <u>(140,500)</u>
Revenue (net)	508,426	297,394
Gross margin (see #55)	(106,126)	(94,094)
Difference	<u>\$402,300</u>	<u>\$203,300</u>

Diff: 3

Terms: sales value at splitoff method, splitoff point

Objective: 3

AACSB: Analytical skills

28) Chem Manufacturing Company processes direct materials up to the splitoff point where two products (X and Y) are obtained and sold. The following information was collected for the month of November:

Direct materials processed: 10,000 gallons (10,000 gallons yield 9,500 gallons of good product and 500 gallons of shrinkage)

Production: X 5,000 gallons
Y 4,500 gallons

Sales: X 4,750 at \$150 per gallon
Y 4,000 at \$100 per gallon

The cost of purchasing 10,000 gallons of direct materials and processing it up to the splitoff point to yield a total of 9,500 gallons of good products was \$975,000.

The beginning inventories totaled 50 gallons for X and 25 gallons for Y. Ending inventory amounts reflected 300 gallons of Product X and 525 gallons of Product Y. October costs per unit were the same as November.

Using the physical-volume method, what is Product X's approximate gross-margin percentage?

- A) 32%
- B) 33%
- C) 35%
- D) 38%

Answer: A

Explanation: A) Sales (4,750 × \$150)	\$712,500
Cost of Goods Sold 4,750 × \$*513,142/5,000	487,485
Gross Margin	\$225,015

* $5,000 / (5,000 + 4,500) = 0.5263 \times \$975,000 = \$513,142$

Gross-margin percentage $\$225,015 / \$712,500 = 0.32$ rounded

Diff: 2

Terms: physical-measure method

Objective: 3

AACSB: Analytical skills

29) Beverage Drink Company processes direct materials up to the splitoff point where two products, A and B, are obtained. The following information was collected for the month of July:

Direct materials processed: 2,500 liters (with 20% shrinkage)

Production:

A	1,500 liters
B	500 liters

Sales:

A	\$15.00 per liter
B	\$10.00 per liter

The cost of purchasing 2,500 liters of direct materials and processing it up to the splitoff point to yield a total of 2,000 liters of good products was \$4,500. There were no inventory balances of A and B.

Product A may be processed further to yield 1,375 liters of Product Z5 for an additional processing cost of \$150. Product Z5 is sold for \$25.00 per liter. There was no beginning inventory and ending inventory was 125 liters.

Product B may be processed further to yield 375 liters of Product W3 for an additional processing cost of \$275. Product W3 is sold for \$30.00 per liter. There was no beginning inventory and ending inventory was 25 liters.

If Product Z5 and Product W3 are produced, what are the expected sales values of production, respectively?

- A) \$11,250 and \$34,375
- B) \$22,500 and \$ 5,000
- C) \$31,250 and \$10,500
- D) \$34,375 and \$11,250

Answer: D

Explanation:

$$\text{D) Z5} = 1,375 \text{ liters} \times \$25 = \$34,375$$

$$\text{W3} = 375 \text{ liters} \times \$30 = \$11,250$$

Diff: 2

Terms: sales value at splitoff method

Objective: 3

AACSB: Analytical skills

30) Cola Drink Company processes direct materials up to the splitoff point where two products, A and B, are obtained. The following information was collected for the month of July:

Direct materials processed: 2,500 liters (with 20% shrinkage)

Production:

A	1,500 liters
B	500 liters

Sales:

A	\$15.00 per liter
B	\$10.00 per liter

The cost of purchasing 2,500 liters of direct materials and processing it up to the splitoff point to yield a total of 2,000 liters of good products was \$4,500. There were no inventory balances of A and B.

Product A may be processed further to yield 1,375 liters of Product Z5 for an additional processing cost of \$150. Product Z5 is sold for \$25.00 per liter. There was no beginning inventory and ending inventory was 125 liters.

Product B may be processed further to yield 375 liters of Product W3 for an additional processing cost of \$275. Product W3 is sold for \$30.00 per liter. There was no beginning inventory and ending inventory was 25 liters.

What is Product Z5's estimated net realizable value at the splitoff point?

- A) \$11,100
- B) \$22,350
- C) \$34,225
- D) \$34,375

Answer: C

Explanation: C) $1,375 \times \$25 = \$34,375$; $\$34,375 - \$150 = \$34,225$

Diff: 3

Terms: net-realizable value (NRV) method

Objective: 3

AACSB: Analytical skills

31) Which of the following is a DISADVANTAGE of the physical-measure method of allocating joint costs?

- A) The measurement basis for each product may be different.
- B) The need for a common denominator.
- C) The physical measure may not reflect the product's ability to generate revenues.
- D) All of these answers are correct.

Answer: D

Diff: 2

Terms: physical-measure method

Objective: 3

AACSB: Reflective thinking

32) Which of the methods of allocating joint costs usually is considered the simplest to implement?

- A) estimated net realizable value
- B) constant gross-margin percentage NRV
- C) sales value at splitoff
- D) All of these answers are correct.

Answer: C

Diff: 2

Terms: joint costs, sales value at splitoff method

Objective: 3

AACSB: Reflective thinking

33) Industries that recognize income on each product when production is completed include:

- A) mining
- B) toy manufacturers
- C) canning
- D) Both A and C are correct.

Answer: D

Diff: 2

Terms: byproducts

Objective: 3

AACSB: Reflective thinking

34) Why do accountants criticize the practice of carrying inventories at estimated net realizable values?

- A) The costs of producing the products are usually estimates.
- B) There is usually no clearly defined realizable value for these inventories.
- C) The effect of this practice is to recognize income before sales are made.
- D) All of these answers are correct.

Answer: C

Diff: 2

Terms: net-realizable value (NRV) method

Objective: 3

AACSB: Reflective thinking

35) The constant gross-margin percentage NRV method of joint cost allocation:

- A) involves allocating costs in such a way that maintaining the same gross margin percentage for each product that was obtained in prior years
- B) involves allocating costs in such a way that the overall gross margin percentage is identical for the individual products
- C) is the same as the estimated NRV method
- D) is the same as the sales-value at splitoff method

Answer: B

Diff: 2

Terms: byproducts

Objective: 3

AACSB: Reflective thinking

36) The sales value at splitoff method is an example of allocating costs using physical measures.

Answer: FALSE

Explanation: The sales value at splitoff method is an example of allocating costs using market based data.

Diff: 2

Terms: sales value at splitoff method

Objective: 3

AACSB: Reflective thinking

37) The sales value at splitoff method enables the accountant to obtain individual product costs and gross margins.

Answer: TRUE

Explanation: The sales value at splitoff method enables the accountant to obtain individual product costs and gross margins.

Diff: 2

Terms: sales value at splitoff method

Objective: 3

AACSB: Reflective thinking

38) An advantage of the physical-measure method is that obtaining physical measures for all products is an easy task.

Answer: FALSE

Explanation: For some products such as gas, obtaining physical measures is difficult.

Diff: 2

Terms: physical-measure method

Objective: 3

AACSB: Reflective thinking

39) The sales value at splitoff method allocates joint costs to joint products produced during the accounting period on the basis of the relative total sales value at the splitoff point.

Answer: TRUE

Diff: 1

Terms: physical-measure method, joint products, main products

Objective: 3

AACSB: Reflective thinking

40) The estimated net realizable value method is used when the market selling prices at the splitoff point are NOT available.

Answer: TRUE

Diff: 2

Terms: net-realizable value (NRV) method

Objective: 3

AACSB: Reflective thinking

41) The net realizable value (NRV) method allocates joint costs to joint products produced during the accounting period on the basis of their relative NRV—final sales value plus separable costs.

Answer: FALSE

Explanation: The **net realizable value (NRV) method** allocates joint costs to joint products produced during the accounting period on the basis of their relative NRV—final sales value minus separable costs.

Diff: 2

Terms: net-realizable value (NRV) method

Objective: 3

AACSB: Reflective thinking

42) The net realizable value method is generally used for products or services that are processed and after splitoff additional value is added to the product and a selling price can be determined.

Answer: TRUE

Diff: 2

Terms: net-realizable value (NRV) method, splitoff point

Objective: 3

AACSB: Reflective thinking

43) The constant gross-margin percentage NRV method allocates joint costs to joint products produced during the accounting period in such a way that each individual product achieves an identical gross-margin percentage.

Answer: TRUE

Diff: 2

Terms: constant gross-margin percent NRV, joint costs, splitoff point NRV method

Objective: 3

AACSB: Reflective thinking

44) The constant gross-margin percentage method differs from market-based joint-cost allocation method (sales value at splitoff and estimated net realizable value) since no account is taken of profits earned before or after the splitoff point when allocating joint costs.

Answer: FALSE

Explanation: The constant gross-margin percentage method takes account of the profits earned before or after the splitoff when allocating joint costs.

Diff: 2

Terms: constant gross-margin percent NRV, joint costs, splitoff point NRV method

Objective: 3

AACSB: Reflective thinking

45) The sales value at splitoff method presupposes the exact number of subsequent steps undertaken for further processing.

Answer: FALSE

Explanation: The sales value at splitoff method does not presuppose the exact number of subsequent steps.

Diff: 2

Terms: sales value at splitoff method

Objective: 3

AACSB: Reflective thinking

46) A criticism of the practice of carrying inventories at estimated net realizable values is that this practice recognizes income before sales are made.

Answer: TRUE

Diff: 2

Terms: net-realizable value (NRV) method

Objective: 3

AACSB: Reflective thinking

47) The only allowable method of joint cost allocation is specified by FASB.

Answer: FALSE

Explanation: The FASB does not specify a single allowable method of joint cost allocation.

Diff: 2

Terms: byproducts, joint products

Objective: 3

AACSB: Reflective thinking

48) The constant gross-margin percentage NRV method is the only method of allocating joint costs under which products may receive negative allocations.

Answer: TRUE

Diff: 1

Terms: constant gross-margin percent NRV, joint costs, splitoff point NRV method

Objective: 3

AACSB: Reflective thinking

49) The sales-value at splitoff method of joint cost allocation involves computation of the relative amounts of the sales value of the amount of each joint product sold during the period.

Answer: TRUE

Diff: 1

Terms: sales value at splitoff method, joint costs

Objective: 3

AACSB: Reflective thinking

50) The constant gross-margin percentage NRV method allocates joint costs to joint products in such a way that the gross margin on each joint product is the same as it was in the previous year.

Answer: FALSE

Explanation: The constant gross-margin percentage NRV method allocates joint costs to joint products in such a way that the overall gross margin percentage is identical for the individual products.

Diff: 2

Terms: constant gross-margin percentage NRV method, joint products

Objective: 3

AACSB: Reflective thinking

51) For each of the following methods of allocating joint costs, give a positive or a negative aspect of selecting each one to allocate joint costs.

- a. sales value at splitoff
- b. estimated net realizable value method
- c. the constant gross margin method
- d. a physical measure such as volume

Answer:

a. *Positive:* Costs are allocated to products in proportion to their potential revenues. This is a fairly simple method to implement.

Negative: We use the sales value of the entire production of the accounting period.

b. *Positive:* It can be used when the market prices of the products are not known or available.

Negative: It can be very complex in operations with multiple products and multiple splitoff points.

c. *Positive:* Account is taken of the profits earned either before or after the splitoff point when allocating the joint costs.

Negative: The assumption is made that all have the same ratio of cost to sales value. This is likely not true.

d. *Positive:* It is fairly simple to use.

Negative: It has no relationship to the revenue-producing power of individual products.

Diff: 2

Terms: sales value at splitoff, NRV, const gross-margin % NRV, phys-measure method

Objective: 3

AACSB: Analytical skills

52) Sugar Cane Company processes sugar cane into three products. During May, the joint costs of processing were \$240,000. Production and sales value information for the month were as follows:

Product	Units Produced	Sales Value at Splitoff Point	Separable costs
Sugar	6,000	\$80,000	\$24,000
Sugar Syrup	4,000	70,000	64,000
Fructose Syrup	2,000	50,000	32,000

Required:

Determine the amount of joint cost allocated to each product if the sales value at splitoff method is used.

Answer:

Product	Units	Sales Value	Percent	Joint Cost	Allocated
Sugar	6,000	\$80,000	40% ×	\$240,000	\$96,000
Sugar Syrup	4,000	70,000	35% ×	240,000	84,000
Fructose Syrup	2,000	50,000	25% ×	240,000	60,000
Total		\$200,000	100%		\$240,000

Diff: 2

Terms: sales value at splitoff method

Objective: 3

AACSB: Analytical skills

53) Calamata Corporation processes a single material into three separate products A, B, and C. During September, the joint costs of processing were \$300,000. Production and sales value information for the month were as follows:

Product	Units Produced	Final Sales Value per Unit	Separable Costs
A	10,000	\$25	\$125,000
B	15,000	30	250,000
C	12,500	24	125,000

Required:

Determine the amount of joint cost allocated to each product if the constant gross-margin percentage NRV method is used.

Answer: The gross margin percentage is 20% $(\$1,000,000 - \$800,000) / \$1,000,000$

Product	Final Sales Value	Less Gross Margin	Total Production Costs	Less Separable Costs	Joint Costs Allocated
A	\$ 250,000	\$50,000	\$ 200,000	\$ 125,000	\$ 75,000
B	450,000	90,000	360,000	250,000	110,000
C	300,000	60,000	240,000	125,000	115,000
Total	1,000,000	200,000	800,000	\$500,000	300,000

Diff: 2

Terms: constant gross-margin percentage NRV method, joint products

Objective: 3

AACSB: Analytical skills

54) Oregon Lumber processes timber into four products. During January, the joint costs of processing were \$280,000. There was no inventory at the beginning of the month. Production and sales value information for the month is as follows:

Product	Board feet	Sales Value at	
		Splitoff Point	Ending Inventory
2 x 4's	6,000,000	\$0.30 per board foot	500,000 bdf.
2 x 6's	3,000,000	0.40 per board foot	250,000 bdf.
4 x 4's	2,000,000	0.45 per board foot	100,000 bdf.
Slabs	1,000,000	0.10 per board foot	50,000 bdf.

Required:

Determine the value of ending inventory if the sales value at splitoff method is used for product costing. Round to 3 decimal places when necessary.

Answer:

Product	Board feet	Sales Value	Percent	Joint Cost	Allocated
2 x 4's	6,000,000	\$1,800,000	45.0 %	\$280,000	\$126,000
2 x 6's	3,000,000	1,200,000	30.0 %	280,000	84,000
4 x 4's	2,000,000	900,000	22.5 %	280,000	63,000
Slabs	1,000,000	100,000	2.5 %	280,000	7,000
Totals		\$4,000,000	100.0%		\$280,000

Product	Fraction of Production in Inventory	Allocated	Inventory value
2 x 4's	$500,000/6,000,000 \times$	$\$126,000 =$	\$10,500
2 x 6's	$250,000/3,000,000 \times$	$84,000 =$	7,000
4 x 4's	$100,000/2,000,000 \times$	$63,000 =$	3,150
Slabs	$50,000/1,000,000 \times$	$7,000 =$	350
Total			\$21,000

Diff: 3

Terms: sales value at splitoff method

Objective: 3

AACSB: Analytical skills

55) Zenon Chemical, Inc., processes pine rosin into three products: turpentine, paint thinner, and spot remover. During May, the joint costs of processing were \$240,000. Production and sales value information for the month is as follows:

Product	Units Produced	Sales Value at Splitoff Point
Turpentine	6,000 liters	\$60,000
Paint thinner	6,000 liters	50,000
Spot remover	3,000 liters	25,000

Required:

Determine the amount of joint cost allocated to each product if the physical-measure method is used.

Answer:

Product	Units Produced	Percentage	Joint Costs	Allocated
Turpentine	6,000 liters	40 ×	\$240,000 =	\$96,000
Paint thinner	6,000 liters	40 ×	240,000 =	96,000
Spot remover	3,000 liters	20 ×	240,000 =	48,000
Totals	15,000	100		\$240,000

Diff: 2

Terms: physical-measure method

Objective: 3

AACSB: Analytical skills

56) Red Sauce Canning Company processes tomatoes into catsup, tomato juice, and canned tomatoes. During the summer of 20X5, the joint costs of processing the tomatoes were \$420,000. There was no beginning or ending inventories for the summer. Production and sales value information for the summer is as follows:

Product	Cases	Sales Value at Splitoff Point	Separable Costs	Selling Price
Catsup	100,000	\$6 per case	\$3.00 per case	\$28 per case
Juice	150,000	8 per case	5.00 per case	25 per case
Canned	200,000	5 per case	2.50 per case	10 per case

Required:

Determine the amount allocated to each product if the estimated net realizable value method is used, and compute the cost per case for each product.

Answer:

Product	Expected Sales Value	Separable Costs	Net Realizable Value	Percentage
Catsup	\$2,800,000	\$300,000	\$2,500,000	35.71
Juice	3,750,000	750,000	3,000,000	42.86
Canned	2,000,000	500,000	1,500,000	21.43
Totals			\$7,000,000	100.00

Product	Percentage	Joint Costs	Allocated	Separable Costs	Product Costs
Catsup	35.71% ×	\$420,000 =	\$149,982 +	\$300,000 =	\$449,982
Juice	42.86% ×	420,000 =	180,012 +	750,000 =	930,012
Canned	21.43% ×	420,000 =	90,006 +	500,000 =	590,006

Catsup cost per case = $\$449,982 / 100,000 = \4.50

Juice cost per case = $\$930,012 / 150,000 = \6.20

Canned cost per case = $\$590,006 / 200,000 = \2.95

Diff: 3

Terms: net-realizable value (NRV) method

Objective: 3

AACSB: Analytical skills

57) Pilgrim Corporation processes frozen turkeys. The company has not been pleased with its profit margin per product because it appears that the high value items have too few costs assigned to them, while the low value items have too many costs assigned to them. The processing results in several products, the primary one of which is frozen small turkeys. Other products include frozen parts such as wings and legs, byproducts such as skin and bones, and unused scrap items.

Required:

What may be the cost assignment problem if a key consideration is the value of the products being sold?

Answer: First, the company needs to consider whether the byproducts are being treated as products, rather than byproducts. For the most part, byproducts should not be assigned costs. The revenue from the byproducts should be used as either minor sale categories or else as offsets to processing costs.

A second consideration is the method used to assign the costs. It is possible that some physical measure (weight) is being used, in which case the parts items and the byproducts may weigh as much as the primary product. It may be necessary to evaluate the various methods of allocation and select the one which management feels is best for decision making.

Diff: 2

Terms: joint costs, sales value at splitoff method, physical-measure method

Objective: 3

AACSB: Analytical skills

58) Wharf Fisheries processes many of its seafood items to the demands of its largest customers, most of which are large retail distributors. To keep the accounting system simple, it has always assigned cost by the weight of the finished product. However, with increased competition, it has had to watch its prices closely and, in recent years, several items have incurred zero profit margins. After several weeks of investigation, your consulting firm has found that, while weight is important in processing of seafood, numerous items have very distinct processing steps and some items are processed through more steps than others.

Required:

Based on the findings of your consulting firm, what changes might you recommend to the company in the way of cost allocation among its products?

Answer: Recommendations might include, among others, some of the following:

- a. Categorize the fishing expeditions as joint costs, especially if multiple items are caught.
- b. Categorize all processing activities where multiple items are processed as joint costs.
- c. For those processes that are unique to only one product or a set of products, use separable cost categories.
- d. Choose something other than weight for allocating joint costs. Select one of the value methods of assigning the costs.
- e. Carefully separate main products from byproducts in the costing system.
- f. Do not allocate the joint costs for internal decisions.

Diff: 2

Terms: joint costs, physical-measure method, sales value at splitoff method

Objective: 3

AACSB: Analytical skills

59) Paragon University operates an extensive and an expensive registration, testing, and counseling center, through which all students are required to pass through when they enter the university. The registration effort's costs (for the most part) are almost impossible to allocate based upon which students require time, effort, etc. The cost of this center is approximately 15% of the total costs of Paragon. This department engages in no other activities than the registration of students. Paragon is interested in determining the profitability of the three technical departments it operates. Paragon has the perception that some departments are more profitable than others, and it would like to determine an appropriate method of allocating the costs of this registration center.

Required:

Recommend to Paragon University a method (or methods) of allocating the costs of registration to the three departments.

Answer: The joint costs of the registration effort could be allocated based on physical volume or the sales (tuition) dollars of each department.

Volume. Allocating on volume would be based not upon physical measures, but upon the number of credit hours each of the three departments offer each semester. If the ratio of credit hours for the three departments were 25%, 45%, and 30% then the costs would be allocated based upon these ratios.

Sales Dollars. It is possible that some departments charge more per credit hour than others. In this case it might be appropriate to allocate the costs based upon the total tuition revenues of each department.

Diff: 3

Terms: joint costs, physical-measure method, sales value at splitoff method

Objective: 3

AACSB: Reflective thinking

Objective 16.4

1) Which of the following is NOT a reason to use the sales value at splitoff method:

- A) simplicity
- B) no anticipation of subsequent management decisions
- C) measurement of the value of the joint products at the splitoff point
- D) All of the above are reasons to use the sales value at splitoff method.

Answer: D

Diff: 2

Terms: sales value at splitoff method

Objective: 4

AACSB: Reflective thinking

2) Which method of allocating costs would be used if the selling prices of all products at the splitoff point are UNAVAILABLE?

- A) sales value at splitoff method
- B) NRV method
- C) physical measures method
- D) constant gross-margin percentage method

Answer: C

Diff: 2

Terms: net-realizable value (NRV) method

Objective: 4

AACSB: Reflective thinking

3) What is the reason that accountants do NOT like to carry inventory at net realizable value?

- A) NRV is the most difficult costing method
- B) NRV recognizes income after the sale is complete
- C) NRV recognizes income before sales are made
- D) NRV is acceptable to the taxing authorities

Answer: C

Diff: 2

Terms: net-realizable value (NRV) method

Objective: 4

AACSB: Reflective thinking

4) The sales value at splitoff method is preferable when selling-price data exists at splitoff.

Answer: TRUE

Diff: 2

Terms: sales value at splitoff method

Objective: 4

AACSB: Reflective thinking

5) Physical measures such as weight or volume are the best indicator of the benefits received for allocating joint costs.

Answer: FALSE

Explanation: Revenues are a better indicator of the benefits received than are physical measures.

Diff: 2

Terms: physical-measure method

Objective: 4

AACSB: Reflective thinking

6) The constant gross-margin percentage NRV method makes the simplifying assumption of treating the joint products as though they comprise a single product.

Answer: TRUE

Diff: 2

Terms: constant gross-margin percentage NRV method, joint products

Objective: 4

AACSB: Reflective thinking

7) List the reasons that the sales value at splitoff method of joint cost allocation should be used.

Answer:

1. Measurement of the value of the joint products at splitoff - Sales value at splitoff is the best measure of the benefits received as a result of joint processing.
2. No anticipation of subsequent management decisions - This method does not require information on processing steps after splitoff.
3. Availability of a common basis to allocate joint costs to products - Revenue is the common basis to allocate costs.
4. Simplicity - It is the simplest method compared to the NRV and constant gross-margin percentage NRV methods.

Diff: 3

Terms: sales value at splitoff method

Objective: 4

AACSB: Reflective thinking

8) What are the four methods of allocating joint costs to individual products? Which of these methods is preferred, and what are two advantages of this method?

Answer: The four methods of allocating joint costs to individual products are: the sales-value at splitoff method, estimated net-realizable value (NRV) method, the constant gross margin percentage NRV, and physical measures methods.

Of these methods, the sales-value at splitoff method is preferred when market prices are available, because it is consistent with the benefits-received criterion, it does not depend or anticipate further managerial decisions on further processing, and it is relatively simple.

Diff: 2

Terms: joint costs, sales-val at splitoff, est NRV, const gross margin % NRV, phys meas method

Objective: 3, 4

AACSB: Reflective thinking

Objective 16.5

1) When a product is the result of a joint process, the decision to process the product past the splitoff point further should be influenced by the:

- A) total amount of the joint costs
- B) portion of the joint costs allocated to the individual products
- C) extra revenue earned past the splitoff point
- D) extra operating income earned past the splitoff point

Answer: D

Diff: 1

Terms: joint products

Objective: 5

AACSB: Reflective thinking

2) Which cost allocation method should NOT be used to eliminate the conflict between decision making and performance evaluation?

- A) sales value at splitoff
- B) NRV
- C) physical measures
- D) constant gross-margin percentage NRV

Answer: C

Diff: 1

Terms: joint costs, constant gross-margin % NRV, NRV, and sales value at splitoff method

Objective: 5

AACSB: Reflective thinking

3) If managers make decisions to sell or process further using an incremental revenue/incremental cost approach, which method will show each product budgeted to have a positive (or zero) operating income on the resulting budgeted product-line income statement?

- A) sales value at splitoff
- B) estimated NRV
- C) constant gross-margin percentage NRV
- D) All of these answers are correct.

Answer: D

Diff: 2

Terms: joint products

Objective: 5

AACSB: Reflective thinking

4) What factor most often drives joint cost allocation?

- A) performance evaluation
- B) manager compensation
- C) selling prices
- D) simplicity of the method

Answer: C

Diff: 2

Terms: cost allocation

Objective: 5

AACSB: Reflective thinking

5) Joint costs that do NOT differ between alternatives are particularly relevant for decision making.

Answer: FALSE

Explanation: Only costs that differ are relevant to a manager's decision.

Diff: 2

Terms: joint costs

Objective: 5

AACSB: Reflective thinking

6) Joint processing costs are always relevant for pricing decisions of the final product.

Answer: FALSE

Explanation: Joint processing costs that do not differ between alternatives are not relevant for pricing decisions of the final product.

Diff: 2

Terms: joint products

Objective: 5

AACSB: Reflective thinking

7) All separable costs in joint-cost allocations are always incremental costs.

Answer: FALSE

Explanation: Some of the separable costs may be fixed and therefore not incremental.

Diff: 2

Terms: joint products

Objective: 5

AACSB: Reflective thinking

8) New York Liberty Corporation makes miniature statues of the Empire State Building from cast iron. Sales total 50,000 units a year. The statues are finished either rough or polished, with an average demand of 60% rough and 40% polished. Iron ingots, the direct material, costs \$6 per pound. Processing costs are \$300 to convert 30 pounds into 60 statues. Rough statues are sold for \$15 each, and polished statues can be sold for \$18 or engraved for an additional cost of \$5. Polished statues can then be sold for \$30.

Required:

Determine whether New York Liberty Company should sell the engraved statues. Why?

Answer: New York Liberty should engrave the statues because they increase profits by \$7 per statue.

		Rough		Polished
Sales		\$15.00		\$18.00
Cost of Sales:				
Materials ($\$6 \times 30$)/60	\$3.00		\$3.00	
Conversion $\$300/60$	<u>5.00</u>	8.00	<u>5.00</u>	8.00
Operating Income (loss)		\$7.00		<u>\$10.00</u>

Sales, polished and engraved		\$30.00
Costs:		
Materials	\$3.00	
Conversion	5.00	
Additional Processing	<u>5.00</u>	<u>13.00</u>
Operating Income (loss)		<u>\$17.00</u>
Advantage in favor of selling the engraved statues		<u>\$7.00</u>

Diff: 1

Terms: joint products

Objective: 5

AACSB: Analytical skills

9) What revenue or expense amounts are necessary to make a sell-or-process-further decision and why? What items are irrelevant to the decision and why?

Answer: The revenues and expenses that occur after splitoff are the necessary items to make a sell-or-process-further decision. If incremental revenues are higher than incremental costs, processing further is the correct decision. Expenses that occur before the splitoff point, called joint processing costs, are irrelevant to the decision. These expenses have occurred and have no effect on the decision to sell-or-process-further.

Diff: 2

Terms: sell or process further

Objective: 5

AACSB: Reflective thinking

Objective 16.6

1) Which method of accounting recognizes byproducts in the financial statements at the time their production is completed?

A) production allocation method

B) sale method

C) production method

D) None of these answers is correct.

Answer: C

Diff: 2

Terms: byproducts

Objective: 6

AACSB: Reflective thinking

Answer the following questions using the information below:

Athens Company processes 15,000 gallons of direct materials to produce two products, Product X and Product Y. Product X sells for \$8 per gallon and Product Y, the main product, sells for \$100 per gallon. The following information is for August:

	<u>Production</u>	<u>Sales</u>	<u>Beginning Inventory</u>	<u>Ending Inventory</u>
Product X:	4,375	4,000	0	375
Product Y:	10,000	9,625	125	500

The manufacturing costs totaled \$30,000.

2) What is the byproduct's net revenue reduction if byproducts are recognized in the general ledger during production and their revenues are a reduction of cost?

- A) \$0
- B) \$3,000
- C) \$32,000
- D) \$35,000

Answer: C

Explanation: C) $4,000 \text{ gallons} \times \$8 = \$32,000$

Diff: 3

Terms: byproducts

Objective: 6

AACSB: Analytical skills

3) How much is the ending inventory reduction for the byproduct if byproducts are recognized in the general ledger at the point of sale?

- A) \$0
- B) \$563
- C) \$1,500
- D) \$17,500

Answer: A

Diff: 2

Terms: byproducts

Objective: 6

AACSB: Analytical skills

4) A negative consequence of recording byproducts in the accounting records when the sale occurs is that:

- A) the revenue from the byproducts is usually fairly large, and the accounting records will be distorted
- B) managers can time earnings by their decision when to sell byproducts
- C) managers have an incentive to stockpile byproducts
- D) Both B and C are correct.

Answer: D

Diff: 1

Terms: byproducts

Objective: 6

AACSB: Reflective thinking

- 5) Which statement is NOT true regarding the sales method of accounting for byproducts.
- A) the method makes no journal entries until the byproduct is sold
 - B) this method is the preferred method because of the matching principle
 - C) revenues of the byproduct can be recorded in the income statement as revenue
 - D) revenues of the byproduct can be recorded as a reduction of cost of goods sold in the income statement

Answer: B

Diff: 1

Terms: byproducts

Objective: 6

AACSB: Reflective thinking

- 6) Byproducts are recognized in the general ledger either at the time production is completed or at the time of sale.

Answer: TRUE

Diff: 2

Terms: byproducts

Objective: 6

AACSB: Reflective thinking

- 7) The production method for recognizing byproducts is conceptually correct in that it is consistent with the matching principle.

Answer: TRUE

Explanation: The production method for recognizing byproducts is conceptually correct in that it is consistent with the matching principle.

Diff: 2

Terms: byproducts

Objective: 6

AACSB: Reflective thinking

- 8) A sound reason for reporting revenue from byproducts as an income statement item at the time of sale is to lessen the chance of managers managing reported earnings.

Answer: FALSE

Explanation: This method makes it easier for managers to time earnings since they can time the sale of products and give earnings a boost.

Diff: 2

Terms: byproducts

Objective: 6

AACSB: Reflective thinking

- 9) A byproduct is one or more products of a joint production process that have low total sales value compared to the total sales value of the main product or joint products.

Answer: TRUE

Diff: 1

Terms: byproducts

Objective: 6

AACSB: Reflective thinking

10) The Carolina Company prepares lumber for companies who manufacture furniture. The main product is finished lumber with a byproduct of wood shavings. The byproduct is sold to plywood manufacturers. For July, the manufacturing process incurred \$332,000 in total costs. Eighty thousand board feet of lumber were produced and sold along with 6,800 pounds of shavings. The finished lumber sold for \$6.00 per board foot and the shavings sold for \$0.60 a pound. There were no beginning or ending inventories.

Required:

Prepare an income statement showing the byproduct (1) as a cost reduction during production, and (2) as a revenue item when sold.

Answer:	Cost reduction when produced		Revenue when sold	
Sales: Lumber	\$480,000		\$480,000	
Shavings			4,080	
Total Sales:		\$480,000		484,080
Cost of Good Sold:				
Total manufacturing costs	\$332,000		\$332,000	
Byproduct	4,080		0	
Total COGS		327,920		332,000
Gross Margin		\$152,080		\$152,080

Diff: 2

Terms: byproducts

Objective: 6

AACSB: Analytical skills

11) Distinguish between the two principal methods of accounting for byproducts, the production byproduct method and the sale byproduct method. Briefly discuss the relative merits (or lack thereof) of each.

Answer:

a. *Production byproduct method.*

This method recognizes byproducts in the financial statements at the time their production is completed. The estimated net realizable value from the byproduct produced is offset against the costs of the main (or joint) products, and it is reported in the balance sheet as inventory. Accounting entries are made and the byproducts are reported in the balance sheet at their selling price.

b. *Sale byproduct method.*

This method delays recognition of the byproducts until the time of their sale. Revenues could be recorded in one accounting period, while the expense in an earlier period. Companies may find it necessary to keep an inventory of the byproduct processing costs in a separate account until the byproducts are sold. This practice can be rationalized on the grounds that the dollar amounts of byproducts are immaterial. But managers can use this method to manage reported earnings by timing when they sell byproducts.

Diff: 2

Terms: byproducts

Objective: 6

AACSB: Reflective thinking

12) What are the two methods to account for byproducts. Which is the more appropriate method to use and why?

Answer: The two methods are the production method and the sales method. The production method recognizes byproducts in the financial statements at the time production is completed. The sales method delays recognition of byproducts until the time of sale. The production method is the appropriate method to use because it is consistent with the matching principle. If the sales method were used, the byproduct cost recognition could be delayed for several periods until the inventory is sold.

Diff: 2

Terms: byproducts

Objective: 6

AACSB: Reflective thinking

Objective 16.7

1) The production method of accounting for byproducts recognizes byproducts in the financial statements at the time when production is completed.

Answer: TRUE

Diff: 2

Terms: byproducts

Objective: 7

AACSB: Reflective thinking