

Cost Accounting, Cdn. Ed., 7e (Horngren)

Chapter 15 Cost Allocation: Joint Products and Byproducts

15.1 Distinguish among different types of saleable products, scrap and toxic waste.

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

Answer: FALSE

Explanation: Separable costs are the costs incurred beyond the splitoff point.

Diff: 1 Type: TF

Skill: Remember

Objective: LO 15-1

2) A byproduct has a minimal sales value.

Answer: FALSE

Explanation: Scrap has minimal sales value.

Diff: 2 Type: TF

Skill: Remember

Objective: LO 15-1

3) Scrap frequently has a zero sales value.

Answer: TRUE

Diff: 1 Type: TF

Skill: Remember

Objective: LO 15-1

4) There are no logical reasons for allocating joint costs.

Answer: FALSE

Explanation: Reasons include calculation of inventoriable costs, reimbursement under contracts, etc.

Diff: 1 Type: TF

Skill: Remember

Objective: LO 15-1

5) Separable costs are assignable after the splitoff point.

Answer: TRUE

Diff: 1 Type: TF

Skill: Remember

Objective: LO 15-1

6) Separable costs include manufacturing costs only.

Answer: FALSE

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

Diff: 2 Type: TF

Skill: Remember

Objective: LO 15-1

7) The costs of production that yield multiple products simultaneously are known as joint costs.

Answer: TRUE

Diff: 1 Type: TF

Skill: Remember

Objective: LO 15-1

8) 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 Type: TF

Skill: Remember

Objective: LO 15-1

9) 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 Type: TF

Skill: Remember

Objective: LO 15-1

10) If the value of a byproduct rises significantly, it could also be viewed as a joint product.

Answer: TRUE

Diff: 2 Type: TF

Skill: Understand

Objective: LO 15-1

11) 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: 2 Type: TF

Skill: Remember

Objective: LO 15-1

12) What type of cost is the result of an event that results in multiple products simultaneously?

A) byproduct cost

B) joint cost

C) main cost

D) separable cost

E) splitoff cost

Answer: B

Diff: 1 Type: MC

Skill: Remember

Objective: LO 15-1

13) Costs which are assignable beyond the splitoff point at which individual products emerge are called

- A) byproduct cost.
- B) joint cost.
- C) main cost.
- D) separable cost.
- E) splitoff costs.

Answer: D

Diff: 1 Type: MC

Skill: Remember

Objective: LO 15-1

14) 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.
- E) byproducts and scrap.

Answer: C

Diff: 1 Type: MC

Skill: Remember

Objective: LO 15-1

15) Byproducts and scrap are differentiated by

- A) number of units per processing period.
- B) weight or volume of outputs per period.
- C) management preference only.
- D) the amount of sales value per unit.
- E) the amount of costs assigned to each unit.

Answer: D

Diff: 2 Type: MC

Skill: Remember

Objective: LO 15-1

16) Which of the following is FALSE concerning manufacturing of joint products and joint costing?

- A) The number of outputs produced may exceed the number of products.
- B) An output from the process may be recycled without any value being added by its production.
- C) Some outputs from a joint process have no value and are not recognized in the accounting system.
- D) The physical quantity of outputs not recognized in the accounting system, can exceed the quantities of outputs that recognized in the accounting system.
- E) Joint processes always yield either scrap or byproducts.

Answer: E

Diff: 2 Type: MC

Skill: Understand

Objective: LO 15-1

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

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

Answer: B

Diff: 2 Type: MC

Skill: Understand

Objective: LO 15-1

18) Products with a zero sales value are known as

- A) scrap.
- B) main products.
- C) joint products.
- D) byproducts.
- E) separable products.

Answer: A

Diff: 1 Type: MC

Skill: Remember

Objective: LO 15-1

19) Which of the following statements is TRUE regarding main products, byproducts, and scrap?

- 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.
- E) The distinctions between main products, byproducts, and scrap are well-established in practice.

Answer: C

Diff: 2 Type: MC

Skill: Understand

Objective: LO 15-1

20) Which of the following is NOT a reason to allocate joint cost?

- A) rate regulation requirements, if applicable
- B) cost of goods sold computations
- C) insurance settlement cost information requirements
- D) customer profitability analysis
- E) cause-and-effect analysis

Answer: E

Diff: 3 Type: MC

Skill: Understand

Objective: LO 15-1

21) Assigning joint costs when only a portion of a business's products are sold to a single customer is an example of which of the following?

- A) inventory costing for external financial statements
- B) customer profitability analysis
- C) rate regulation requirements
- D) price regulation
- E) cost reimbursement

Answer: E

Diff: 2 Type: MC

Skill: Remember

Objective: LO 15-1

22) 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) it is important in the understanding of the cause-and-effect relationship.
- 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 ASPE/IFRS requires the business to participate in the cost allocation process.
- D) they are used in the calculation of the suppliers inventoriable costs.
- E) sales discounts often depend on joint cost allocation amounts.

Answer: B

Diff: 2 Type: MC

Skill: Understand

Objective: LO 15-1

23) Which of the following is NOT a reason underlying the importance of allocations for inventory costing and cost of goods sold computations?

- A) Inventory costing is essential for proper balance sheet presentation.
- B) Divisional profitability may affect compensation for divisional managers.
- C) Cost of goods sold is an important component in the determination of net income.
- D) The information may be required for insurance settlement or litigation.
- E) Sell work-in -process or process further decisions prior to the splitoff point.

Answer: E

Diff: 2 Type: MC

Skill: Understand

Objective: LO 15-1

24) Which of the following is TRUE regarding the costs of toxic waste disposal, reclamation, and remediation that result from joint production processing?

- A) Toxic waste costs are treated in the same manner byproduct costs.
- B) Disposal costs should be expensed, other costs charged to cost of goods sold.
- C) The costs should be valued in inventory at net realizable value.
- D) Toxic waste costs are a life-cycle cost that should be added to joint production costs prior to allocation.
- E) All toxic waste costs should be expensed as do not form part of the product.

Answer: D

Diff: 2 Type: MC

Skill: Understand

Objective: LO 15-1

Match each of the following costs with the appropriate joint production process cost classification.

A) joint cost

B) separable cost

25) Cost of processing crude oil in a gasoline refinery.

Diff: 1 Type: MA

Skill: Understand

Objective: LO 15-1

26) Cost of processing timber (trees) at a sawmill.

Diff: 1 Type: MA

Skill: Understand

Objective: LO 15-1

27) Cost of processing lumber into different lengths and sizes at a sawmill.

Diff: 1 Type: MA

Skill: Understand

Objective: LO 15-1

28) Cost of raw tomato processing, tomatoes are to be used for different soups in a soup plant.

Diff: 1 Type: MA

Skill: Understand

Objective: LO 15-1

29) Cost of canning soup in a soup plant.

Diff: 1 Type: MA

Skill: Understand

Objective: LO 15-1

30) Cost of refining gasoline for use in automobiles.

Diff: 1 Type: MA

Skill: Understand

Objective: LO 15-1

31) Cost of moulding plastic for use in making different toys on an assembly line.

Diff: 1 Type: MA

Skill: Understand

Objective: LO 15-1

32) Cost of processing water into different sized bottles for human consumption.

Diff: 1 Type: MA

Skill: Understand

Objective: LO 15-1

33) Cost of processing pulp into paper.

Diff: 1 Type: MA

Skill: Understand

Objective: LO 15-1

Answers: 25) A 26) A 27) B 28) A 29) B 30) B 31) B 32) B 33) B

Match each of the following costs with the appropriate joint production process cost classification.

- A) scrap
- B) main product
- C) byproduct
- D) joint product

34) Bones from a butcher shop

Diff: 1 Type: MA

Skill: Understand

Objective: LO 15-1

35) Sawdust from a sawmill

Diff: 1 Type: MA

Skill: Understand

Objective: LO 15-1

36) Sawdust from a furniture manufacturer

Diff: 1 Type: MA

Skill: Understand

Objective: LO 15-1

37) Fuel oil from petroleum processing

Diff: 1 Type: MA

Skill: Understand

Objective: LO 15-1

38) Salt from a salt works process

Diff: 1 Type: MA

Skill: Understand

Objective: LO 15-1

39) Broth from cooking food

Diff: 1 Type: MA

Skill: Understand

Objective: LO 15-1

40) Raw milk for dairy processing

Diff: 1 Type: MA

Skill: Understand

Objective: LO 15-1

41) Skim milk from dairy processing

Diff: 1 Type: MA

Skill: Understand

Objective: LO 15-1

Answers: 34) A 35) C 36) A 37) D 38) B 39) C 40) D 41) D

42) 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: 2 Type: ES

Skill: Understand

Objective: LO 15-1

43) 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 Type: ES

Skill: Remember

Objective: LO 15-1

44) 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 Type: ES

Skill: Understand

Objective: LO 15-1

45) 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 Type: ES

Skill: Understand

Objective: LO 15-1

46) What are separable costs?

Answer: Separable costs are costs incurred beyond the split-off point on identifiable products.

Diff: 1 Type: ES

Skill: Remember

Objective: LO 15-1

47) Golden Company uses one raw material, gold ore, for all its products. It spends considerable time getting the gold 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 requires difficult extraction methods.

Required:

Can you explain how the company might change its accounting system to better reflect the reporting problems? 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 gold 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 may help highlight the problem but does not pinpoint the actual problem. Maybe they should buy refined gold or else hire experts in the minerals area as part of the purchasing team.

Diff: 2 Type: ES

Skill: Apply

Objective: LO 15-1

48) How should toxic waste be accounted for?

Answer: Toxic waste has negative revenue and should be added to the joint costs of production prior to allocation to main, joint or byproducts.

Diff: 2 Type: ES

Skill: Understand

Objective: LO 15-1

15.2 Analyze the physical measure and sales value at splitoff methods to allocate joint costs.

1) The cause-and-effect criterion is not present when joint costing is used.

Answer: TRUE

Diff: 2 Type: TF

Skill: Understand

Objective: LO 15-2

2) It is easier to cost inventory if the joint products are sold before the splitoff point without further processing.

Answer: FALSE

Explanation: There is not basis for allocation.

Diff: 2 Type: TF

Skill: Understand

Objective: LO 15-2

3) The sales value at splitoff method allocates joint costs according to each product's value, at the splitoff point, of the total production in the accounting period of each product.

Answer: TRUE

Diff: 1 Type: TF

Skill: Remember

Objective: LO 15-2

4) The sales value at splitoff method can be used to value inventory as well as determining cost of goods sold.

Answer: TRUE

Diff: 2 Type: TF

Skill: Remember

Objective: LO 15-2

5) One problem with the physical measure method of allocation is that the physical weights used for allocating joint costs may have no relation to the product's ability to produce revenue.

Answer: TRUE

Diff: 2 Type: TF

Skill: Understand

Objective: LO 15-2

6) A major deficiency of the sales value at splitoff method is that this method does not allow management to obtain individual product costs and gross margin information.

Answer: FALSE

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

Diff: 2 Type: TF

Skill: Remember

Objective: LO 15-2

7) 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 Type: TF

Skill: Understand

Objective: LO 15-2

8) Under the benefits-received criterion, the physical measures method is less desirable than the sales value at splitoff method.

Answer: TRUE

Diff: 2 Type: TF

Skill: Remember

Objective: LO 15-2

9) 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) The cause-and-effect relationship depends on the relative costs to be incurred after splitoff.

E) There is no cause-and-effect relationship.

Answer: E

Diff: 2 Type: MC

Skill: Understand

Objective: LO 15-2

Use the information below to answer the following question(s).

Raynor Manufacturing purchases trees from Tree Nursery 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 October.

Trees processed:

50 trees (yield is 30,000 sheets of paper and 30,000 pencil casings and no scrap)

Production:	
paper	30,000 sheets
pencil casings	30,000
Sales:	
paper	29,000 at \$0.04 per page
pencil casings	30,000 at \$0.10 per casing

Cost of purchasing 50 trees and processing them up to the splitoff point to yield 30,000 sheets of paper and 30,000 pencil casings is \$1,500.

Raynor Manufacturing's accounting department reported no beginning inventories; however, ending inventory amounts reflected 1,000 sheets of paper in stock.

10) What is the paper's sales value at the splitoff point?

- A) \$120
- B) \$1,160
- C) \$1,200
- D) \$1,950
- E) \$3,000

Answer: C

Explanation: C) Paper: 30,000 sheets \times \$0.04 = \$1,200.00

Diff: 1 Type: MC

Skill: Apply

Objective: LO 15-2

11) What are the pencil casings' sales value at the split-off point?

- A) \$300
- B) \$1,480
- C) \$3,000
- D) \$3,750
- E) \$4,500

Answer: C

Explanation: C) Pencils: 30,000 casings \times \$0.10 = \$3,000.00

Diff: 1 Type: MC

Skill: Understand

Objective: LO 15-2

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

- A) 28.57% and 71.43%
- B) 33.33% and 66.67%
- C) 40% and 60%
- D) 49.00% and 51.00%
- E) 50.00% and 50.00%

Answer: A

Explanation: A) $\$1,200 + 3,000 = \$4,200$; $\$1,200/\$4,200 = 28.57\%$; $\$3,000/\$4,200 = 71.43\%$

Diff: 2 Type: MC

Skill: Apply

Objective: LO 15-2

13) What are the approximate joint costs assigned to the paper ending inventory if joint costs are allocated using the sales value at splitoff method?

- A) \$14.29
- B) \$50.00
- C) \$428.55
- D) \$435.00
- E) \$750.00

Answer: A

Explanation: A) $28.57\% \times \$1,500 \times 1,000/30,000 = \14.29

Diff: 3 Type: MC

Skill: Apply

Objective: LO 15-2

14) What is the approximate cost assigned to the pencil casings if joint costs are allocated using the sales value at splitoff method?

- A) \$750
- B) \$765
- C) \$1,005
- D) \$1,071
- E) \$1,500

Answer: D

Explanation: D) $71.43\% \times \$1,500 = \$1,071.45$

Diff: 2 Type: MC

Skill: Apply

Objective: LO 15-2

- 15) What is the paper's production approximate cost per unit if the sales value at splitoff method is used?
- A) \$0.0143
 - B) \$0.0150
 - C) \$0.0250
 - D) \$0.0259
 - E) \$0.0300

Answer: A

Explanation: A) $\$429/30,000$ sheets = \$0.0143

Diff: 2 Type: MC

Skill: Apply

Objective: LO 15-2

- 16) What is the approximate production cost per unit for each pencil casing if the sales value at splitoff method is used?

- A) \$0.0250
- B) \$0.0255
- C) \$0.0335
- D) \$0.0357
- E) \$0.0533

Answer: D

Explanation: D) $\$1,071/30,000$ casings = \$0.0357

Diff: 2 Type: MC

Skill: Apply

Objective: LO 15-2

- 17) Two finished products, [A & B], are sold for \$16 a unit and \$24 a unit, respectively. Each product can also be sold at the splitoff point. Product A can be sold for \$10 and Product B for \$8. Joint costs for the two products totalled \$8,000 for January for 600 units of A and 500 units of B.

What are the respective joint costs assigned to each unit of products A and B if the sales value at splitoff method is used?

- A) \$5.92 and \$8.88
- B) \$6.40 and \$14.40
- C) \$6.40 and \$9.10
- D) \$8.00 and \$9.10
- E) \$8.00 and \$6.40

Answer: E

Explanation: E) Total splitoff market value = $(600 \times \$10) + (500 \times \$8) = \$10,000$

Product A = $\$6,000/\$10,000 \times \$8,000 = \$4,800/600 = \$8.00$

Product B = $\$4,000/\$10,000 \times \$8,000 = \$3,200/500 = \$6.40$

Diff: 2 Type: MC

Skill: Apply

Objective: LO 15-2

18) Which method allocates joint costs on the basis of each product's relative sales value at the splitoff point?

- A) the constant gross margin percentage NRV method
- B) the estimated net realizable value method
- C) the physical measure method
- D) the sales value at splitoff method
- E) the splitoff method

Answer: D

Diff: 1 Type: MC

Skill: Remember

Objective: LO 15-2

Use the information below to answer the following question(s).

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 litres (10,000 litres yield 9,500 litres of good product and 500 litres of shrinkage)

Production:	X 5,000 litres	Y 4,500 litres
Sales:	X 4,750 at \$150 per litre	Y 4,000 at \$100 per litre

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

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

19) What are the respective physical volume proportions for products X and Y?

- A) 55.00% and 45.00%
- B) 54.00% and 46.00%
- C) 52.63% and 47.37%
- D) 47.37% and 53.63%
- E) 36.36 % and 63.64%

Answer: C

Explanation: C) X: $5,000/9,500 = 52.63\%$ Y: $4,500/9,500 = 47.37\%$

Diff: 1 Type: MC

Skill: Understand

Objective: LO 15-2

20) What is the approximate portion of the joint costs that should be allocated to products X and Y, respectively, using a physical volume measure?

- A) \$461,858 and \$513,142
- B) \$487,500 and \$487,500
- C) \$513,142 and \$461,858
- D) \$529,285 and \$445,715
- E) \$530,000 and \$470,000

Answer: C

Explanation: C) X: $52.63\% \times \$975,000 = \$513,142$ (depends on rounding) Could be \$513,158

Y: $47.37\% \times \$975,000 = \$461,858$ (depends on rounding) Could be \$461,842

Diff: 2 Type: MC

Skill: Understand

Objective: LO 15-2

21) What is Product X's approximate production cost per unit using the physical volume method?

- A) \$0.10
- B) \$10.23
- C) \$53.15
- D) \$55.00
- E) \$102.63

Answer: E

Explanation: E) $\$513,142/5,000 \text{ litres} = \102.63

Diff: 2 Type: MC

Skill: Understand

Objective: LO 15-2

22) What is the approximate amount of joint costs in Product Y's ending inventory if the physical volume method is used and the company uses the FIFO inventory method?

- A) \$50,917
- B) \$53,883
- C) \$60,145
- D) \$60,285
- E) \$67,358

Answer: B

Explanation: B) $\$975,000 \times 4,500/9,500 = \$461,842$; $\$461,842/4,500 \text{ litres} = \$102.63 \times 525 = \$53,883$

Diff: 3 Type: MC

Skill: Analyze

Objective: LO 15-2

23) What is product Y's approximate joint production cost if the sales value at splitoff point method is used?

- A) \$365,625
- B) \$419,250
- C) \$458,250
- D) \$600,000
- E) \$609,375

Answer: A

Explanation: A) Total value = $(5,000 \times \$150) + (4,500 \times \$100) = \$1,200,000$

Product Y percentage = $\$450,000/\$1,200,000 = 0.375$

Cost allocated = $\$975,000 \times 0.375 = \$365,625$

Diff: 2 Type: MC

Skill: Understand

Objective: LO 15-2

24) What is product X's approximate gross margin percentage using the physical volume method?

- A) 30%
- B) 32%
- C) 33%
- D) 35%
- E) 38%

Answer: B

Explanation: B) Sales $(4,750 \times \$150)$ \$712,500

Cost of goods sold:

$4,750 \times \$513,142/5,000$ 487,485

Gross margin \$225,015

Gross margin percentage $\$225,015/\$712,500 = 31.58\%$

Diff: 2 Type: MC

Skill: Apply

Objective: LO 15-2

25) What method is used when joint costs are allocated according to each item's relative proportion of weight at the splitoff point?

- A) direct proportion method
- B) proportional value method
- C) physical measure method
- D) weighted sales value method
- E) constant margin method

Answer: C

Diff: 1 Type: MC

Skill: Remember

Objective: LO 15-2

- 26) An advantage of the sales value at splitoff method is
- A) the fact that it can be supported subjectively.
 - B) the fact that only a few assumptions are required beyond the splitoff point.
 - C) the fact that there may not be a ready market at the splitoff point.
 - D) it always yields the same results as the gross margin percentage method.
 - E) the cost allocation base is well understood.

Answer: E

Diff: 2 Type: MC

Skill: Understand

Objective: LO 15-2

- 27) If joint products end up with the same gross margin percentage, which of the following is TRUE?
- A) The cost allocation method assigned the same cost per unit to each product.
 - B) The physical measure method must have been used.
 - C) The gross margin percentage NRV method must have been used.
 - D) The estimated net realizable method must have been used.
 - E) If all products are sold at the splitoff point, and there were no opening inventories, the sales value at splitoff method could have been used.

Answer: E

Diff: 3 Type: MC

Skill: Understand

Objective: LO 15-2

- 28) Which of the following is FALSE concerning the physical measure method?
- A) Technical personnel outside of accounting may be required in the joint costing determinations.
 - B) Using the benefits-received criterion, the physical measure method less preferred than the sales at splitoff method.
 - C) The physical measure may not reflect each individual product's ability to generate revenues.
 - D) Using a common physical measure can result in the product with the lowest revenue-producing power having the most costs assigned to it.
 - E) It results in a constant gross margin for all products.

Answer: E

Diff: 3 Type: MC

Skill: Understand

Objective: LO 15-2

- 29) In rate regulation settings, which method is usually preferred over the sales value method?
- A) constant gross margin percentage NRV method
 - B) estimated net realizable method
 - C) physical measure method
 - D) sales value at splitoff method
 - E) rate regulation method

Answer: C

Diff: 2 Type: MC

Skill: Understand

Objective: LO 15-2

30) Advantages of the sales value at splitoff method include all of the following EXCEPT

- A) it does not presuppose an exact number of subsequent steps for further processing.
- B) it uses a meaningful denominator.
- C) there is no anticipation of subsequent management decisions.
- D) it is simple.
- E) the allocation of joint costs could lead managers to make poor decisions.

Answer: E

Diff: 2 Type: MC

Skill: Understand

Objective: LO 15-2

31) The Arvid Corporation manufactures widgets, gizmos, and turnbols from a joint process. May production is 4,000 widgets; 7,000 gizmos; and 8,000 turnbols. Respective per unit selling prices at splitoff are \$15, \$10, and \$5. 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
- E) \$60,000

Answer: B

Explanation: B) $\$15 \times 4,000 = \$60,000$

$\$10 \times 7,000 = \$70,000$

$\$5 \times 8,000 = \underline{\$40,000}$

Total = $\$170,000$

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

Diff: 2 Type: MC

Skill: Apply

Objective: LO 15-2

32) Product X is sold for \$8 a unit and Product Y is sold for \$12 a unit. Each product can also be sold at the splitoff point. Product X can be sold for \$5 and Product Y for \$4. Joint costs for the two products totaled \$4,000 for January for 600 units of X and 500 units of Y. What are the respective joint costs assigned to 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
- E) \$3.20 and \$4.00

Answer: C

Explanation: C) Total splitoff market value = $(600 \times \$5) + (500 \times \$4) = \$5,000$

Product X = $\$3,000 / \$5,000 \times \$4,000 = \$2,400 / 600 = \$4.00$

Product Y = $\$2,000 / \$5,000 \times \$4,000 = \$1,600 / 500 = \$3.20$

Diff: 2 Type: MC

Skill: Apply

Objective: LO 15-2

Answer the following question(s) 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 litres (242,500 litres of good product)

<i>Production:</i>	Mr. DirtOut	147,500 litres
	Mr. SinkClean	95,000 litres
<i>Sales:</i>	Mr. DirtOut	140,500 at \$110 per litre
	Mr. SinkClean	91,000 at \$100 per litre

The cost of purchasing 250,000 litres of direct materials and processing it up to the splitoff point to yield a total of 242,500 litres of good product was \$380,000.

33) 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%
- E) 41.00% and 59.00%

Answer: B

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

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

Diff: 2 Type: MC

Skill: Apply

Objective: LO 15-2

34) 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) \$231,116 and \$148,884
- B) \$224,200 and \$155,800
- C) \$227,202 and \$152,798
- D) \$155,800 and \$224,200
- E) \$148,884 and \$231,116

Answer: A

Explanation: A) $\$380,000 \times (147,500/242,500) = \$231,116$; $\$380,000 \times (95,000/242,500) = \$148,884$

Diff: 2 Type: MC

Skill: Apply

Objective: LO 15-2

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

- A) \$1.52
- B) \$1.54
- C) \$1.57
- D) \$1.61
- E) \$1.01

Answer: C

Explanation: C) [$\$380,000 \times (147,500/242,500)$]/147,500 = \$1.57

Diff: 2 Type: MC

Skill: Apply

Objective: LO 15-2

Answer the following question(s) using the information below:

The Morton 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: 65,000 litres (shrinkage was 10%)

Production:	condensed goat milk	26,100 litres
	skim goat milk	32,400 litres
Sales:	condensed goat milk	\$3.50 per litre
	skim goat milk	\$2.50 per litre

The costs of purchasing the 65,000 litres of unprocessed goat milk and processing it up to the splitoff point to yield a total of 58,500 litres of salable product was \$72,240. There were no inventory balances of either product.

Condensed goat milk may be processed further to yield 19,500 litres (the remainder is shrinkage) of a medicinal milk product, Xyla, for an additional processing cost of \$3 per usable litre. Xyla can be sold for \$18 per litre.

Skim goat milk can be processed further to yield 28,100 litres of skim goat ice cream, for an additional processing cost per usable litre of \$2.50. The product can be sold for \$9 per litre.

There are no beginning and ending inventory balances.

36) 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%
- E) 41.9%

Answer: C

Explanation: C)

	Condensed Goat Milk	Skim Goat Milk	Total
Revenues	$26,100 \times \$3.50 = \$91,350$	$32,400 \times \$2.50 = \$81,000$	\$172,350
Percentage	$\$91,350/\$172,350 = 0.53$	$\$81,000/\$172,350 = 0.47$	
Joint costs allocated	$\$72,240 \times .53 = \$38,287$	$\$72,240 \times .47 = \$33,953$	
Gross margin	\$53,063	\$47,047	
GM percentage	$\$53,063/\$91,350 = 0.581$	$\$47,047/\$81,000 = 0.581$	

Diff: 3 Type: MC

Skill: Analyze

Objective: LO 15-2

37) 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%
- E) 41.9%

Answer: C

Explanation: C)

	Condensed Goat Milk	Skim Goat Milk	Total
Revenues	$26,100 \times \$3.50 = \$91,350$	$32,400 \times \$2.50 = \$81,000$	\$172,350
Percentage	$\$91,350/\$172,350 = 0.53$	$\$81,000/\$172,350 = 0.47$	
Joint costs allocated	$\$72,240 \times .53 = \$38,287$	$\$72,240 \times .47 = \$33,953$	
Gross margin	\$53,063	\$47,047	
GM percentage	$\$53,063/\$91,350 = 0.581$	$\$47,047/\$81,000 = 0.581$	

Diff: 3 Type: MC

Skill: Analyze

Objective: LO 15-2

Use the information below to answer the following question(s).

Cranbrook Chemical Ltd. manufactures two industrial compounds. In the month of May, 15,000 litres of direct material costing \$160,000 were processed at a cost of \$400,000. The joint process yielded 16,000 containers of a compound known as Jarlon and 4,000 containers of a compound known as Kharton. The respective selling prices of Jarlon and Kharton are \$38 and \$58. Both products may be processed further. Jarlon may be processed into Jaxton at an incremental cost of \$8 per jar of the final product while Kharton may be processed into Kraxton at an additional cost of \$32 per jar of the final product. The volume of jars of the final product are: 12,000 and 3,000 for Jaxton and Kraxton respectively. The selling price of Jaxton is \$48 per jar. The selling price of Kraxton is \$102 per jar.

38) Using the sales value at splitoff method, the percentage weightings for joint cost allocations for Jarlon and Kharton respectively are

- A) 27.62% and 72.38%.
- B) 80.00% and 20.00%.
- C) 39.58% and 60.42%.
- D) 72.38% and 27.62%.
- E) 60.42% and 39.58%.

Answer: D

Explanation: D) Jarlon sales value at splitoff = 16,000 @ \$38 = \$608,000

Kharton sales value at splitoff = 4,000 @ \$58 = \$232,000

$J = 608 / [608 + 232] = 72.38\%$; $K = 232 / [608 + 232] = 27.62\%$

Diff: 2 Type: MC

Skill: Apply

Objective: LO 15-2

39) Using the physical measures method, the weightings for joint cost allocations for Jarlon and Kharton respectively are

- A) 27.62% and 72.38%.
- B) 80.00% and 20.00%.
- C) 39.58% and 60.42%.
- D) 72.38% and 27.62%.
- E) 60.42% and 39.58%.

Answer: B

Explanation: B) Jarlon = $16,000 / [16,000 + 4,000] = 80\%$; Kharton = $4,000 / [16,000 + 4,000] = 20\%$

Diff: 2 Type: MC

Skill: Apply

Objective: LO 15-2

40) Using the sales value at splitoff method, the joint costs allocated to Jarlon would be

- A) \$289,520.
- B) \$115,808.
- C) \$405,328.
- D) \$110,480.
- E) \$154,672.

Answer: C

Explanation: C) $\$608,000 / \$840,000 = 72.38\%$; $72.38\% * [\$160,000 + \$400,000] = \$405,328$

Diff: 2 Type: MC

Skill: Apply

Objective: LO 15-2

- 41) Using the sales value at splitoff method, the joint costs allocated to Kharton would be
- A) \$289,520.
 - B) \$115,808.
 - C) \$110,480.
 - D) \$154,672.
 - E) \$405,328.

Answer: D

Explanation: D) Jarlon sales value at splitoff = 16,000 @ \$38 = \$608,000

Kharton sales value at splitoff = 4,000 @ \$58 = \$232,000

$J = 608 / [608 + 232] = 72.38\%$; $K = 232 / [608 + 232] = 27.62\%$

$27.62\% * [\$160,000 + \$400,000] = \$154,672$

Diff: 2 Type: MC

Skill: Apply

Objective: LO 15-2

- 42) Using the physical measures method, the joint costs allocated to Jarlon would be

- A) \$320,000.
- B) \$112,000.
- C) \$405,328.
- D) \$448,000.
- E) \$289,520

Answer: D

Explanation: D) Jarlon = $16,000 / [16,000 + 4,000] = 80\%$; Kharton = $4,000 / [16,000 + 4,000]$

$80\% * [\$160,000 + \$400,000] = \$448,000$

Diff: 2 Type: MC

Skill: Apply

Objective: LO 15-2

- 43) Using the physical measures method, the joint costs allocated to Kharton would be

- A) \$320,000.
- B) \$112,000.
- C) \$154,672.
- D) \$448,000.
- E) \$110,480.

Answer: B

Explanation: B) Jarlon = $16,000 / [16,000 + 4,000] = 80\%$; Kharton = $4,000 / [16,000 + 4,000]$

$20\% * [\$160,000 + \$400,000] = \$112,000$

Diff: 2 Type: MC

Skill: Apply

Objective: LO 15-2

44) Assuming Cranbrook uses the sales value at splitoff method and 2,000 containers of Jarlon and 75 containers of Kharton are unsold at the end of the period, Cranbrook would report ending inventory of

- A) \$38,272.
- B) \$56,598.
- C) \$53,560.
- D) \$79,240.
- E) \$58,100.

Answer: C

Explanation: C) Jarlon sales value at splitoff = 16,000 @ \$38 = \$608,000

Kharton sales value at splitoff = 4,000 @ \$58 = \$232,000

J = $608 / [608 + 232] = 72.38\%$; K = $232 / [608 + 232] = 27.62\%$

Joint costs allocated are \$405,328 and \$154,672 for J and K respectively

Unit costs are $\$405,328 / 16,000 = \25.33 for J

Units costs are $\$154,672 / 4,000 = \38.67 for K

Ending inventory = $[\$25.33 * 2,000] + [\$38.67 * 75] = \$50,660 + \$2,900 = \$53,560$

Diff: 3 Type: MC

Skill: Analyze

Objective: LO 15-2

45) Assuming Cranbrook uses the physical measures method and 2,000 containers of Jarlon and 75 containers of Kharton are unsold at the end of the period, Cranbrook would report cost of goods sold of

- A) \$58,100.
- B) \$506,400.
- C) \$358,500.
- D) \$143,400.
- E) \$501,900.

Answer: E

Explanation: E) Jarlon = $16,000 / [16,000 + 4,000] = 80\%$; Kharton = $4,000 / [16,000 + 4,000] = 20\%$

$80\% * [\$160,000 + \$400,000] = \$448,000$ for Jarlon $\$448,000 / 16,000 = \28 per container

$16,000 - 2,000 = 14,000$ units sold of J; $4,000 - 75 = 3,925$ units sold of K

$20\% * \$560,000 = \$112,000$ for Kharton $\$112,000 / 4,000 = \28 per container

Total Cost of goods sold = $[14,000 \text{ units} * \$28] + [3,925 * \$28] = \$501,900$

Diff: 3 Type: MC

Skill: Analyze

Objective: LO 15-2

46) Yip 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:

<i>Trees processed:</i>	100 trees (yield is 70,000 sheets of paper and 60,000 pencil casings and no scrap)	
<i>Production:</i>	paper	70,000 sheets
	pencil casings	60,000
<i>Sales:</i>	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.

Yip'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) 54.00% and 46.00%
- E) 53.00% and 47.00%

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 Type: MC

Skill: Apply

Objective: LO 15-2

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:

<i>Trees processed:</i>	100 trees (yield is 60,000 sheets of paper and 60,000 pencil casings and no scrap)
<i>Production:</i>	paper 60,000 sheets
	pencil casings 60,000
<i>Sales:</i>	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.

47) 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
- E) \$80.00

Answer: A

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

Pencil casings: 60,000 casings × \$0.10 = \$6,000.00

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

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

Diff: 3 Type: MC

Skill: Analyze

Objective: LO 15-2

48) 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
- E) \$0.0422

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 Type: MC

Skill: Apply

Objective: LO 15-2

Use the information below to answer the following questions:

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.

49) 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%
- E) 46.00% and 54.00%

Answer: C

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

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

Diff: 2 Type: MC

Skill: Apply

Objective: LO 15-2

50) What is the joint cost allocation to product U using the sales value at splitoff method?

- A) \$1,218,750
- B) \$731,250
- C) \$1,248,876
- D) \$701,124
- E) \$1,026,285

Answer: A

Explanation: A) U: $(10,000 \times \$150) / [(10,000 \times \$150) + (9,000 \times \$100)] \times \$1,950,000 = \$1,218,750$

Diff: 2 Type: MC

Skill: Apply

Objective: LO 15-2

51) Sweet Sugar Company processes sugar beets into three products. During April the joint costs of processing were \$240,000. Production and sales value information for the month were as follows:

Sales Value at

Product	Units Produced	Splitoff Sales Value	Separable Costs
Sugar	12,000	\$80,000	\$24,000
Sugar syrup	8,000	\$70,000	\$64,000
Fructose syrup	4,000	\$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	12,000	\$80,000	40% × \$240,000	\$96,000
Sugar syrup	8,000	70,000	35 × 240,000	84,000
Fructose syrup	4,000	<u>50,000</u>	25 × 240,000	60,000
Total		<u>\$200,000</u>	<u>100%</u>	<u>\$240,000</u>

Diff: 2 Type: ES

Skill: Apply

Objective: LO 15-2

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

Sales Value at

Product	Boardmetres	splitoff Point	Ending Inventory
2 × 4's	6,000,000	\$0.30 per boardmetre	500,000 boardmetre
2 × 6's	3,000,000	0.40 per boardmetre	250,000 boardmetre
4 × 4's	2,000,000	0.45 per boardmetre	100,000 boardmetre
slabs	1,000,000	0.10 per boardmetre	50,000 boardmetre

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	Boardmetres	Sales value	% Joint Cost Allocated
2 × 4's	6,000,000	\$1,800,000	45.0% × 280,000 = \$126,000
2 × 6's	3,000,000	1,200,000	30.0% × 280,000 = 84,000
4 × 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	12,000,000	<u>\$4,000,000</u>	<u>100.0%</u> <u>\$280,000</u>

Product	Fraction of prod. in inventory	Allocated Inventory value
2 × 4's	500,000/6,000,000 × \$126,000 =	\$10,500
2 × 6's	250,000/3,000,000 × 84,000 =	7,000
4 × 4's	100,000/2,000,000 × 63,000 =	3,150
slabs	50,000/1,000,000 × 7,000 =	<u>350</u>
Total		<u>\$21,000</u>

Diff: 3 Type: ES

Skill: Apply

Objective: LO 15-2

53) CSI 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 were as follows:

<u>Product</u>	<u>Units Produced</u>	<u>Sales Value at Splitoff Point</u>
Turpentine	3,000 litres	\$30,000
Paint thinner	3,000 litres	25,000
Spot remover	1,500 litres	12,500

Required:

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

Answer:

<u>Product</u>	<u>Units produced</u>	<u>Percentage</u>	<u>Joint costs Allocated</u>
Turpentine	3,000 litres	40% × \$240,000 =	\$96,000
Paint thinner	3,000 litres	40% × \$240,000 =	96,000
<u>Spot remover</u>	<u>1,500 litres</u>	<u>20% × \$240,000 =</u>	<u>48,000</u>
Totals	7,500 litres	100%	<u>\$240,000</u>

Diff: 2 Type: ES

Skill: Apply

Objective: LO 15-2

54) Peachland Fruit Ltd. harvests blueberries. After harvest, the company sells some berries fresh, freezes others, and processes some into juice. During the summer the joint costs of processing the berry products were \$620,000. Any separable costs for each product are negligible and are not traced. There were no beginning or ending inventories for the summer. Production and sales value information for the summer were as follows:

<u>Product</u>	<u>Units</u>	<u>Sales Value at splitoff Point</u>
Juice	200,000 litres	\$6 per litre
Fresh	300,000 kilograms	\$8 per kilogram
Frozen	400,000 kilograms	\$5 per kilogram

Required:

Determine the amount allocated to each product if the sales value at splitoff method is used and compute the cost per case for each product.

Answer:

<u>Product</u>	<u>Calculation</u>	<u>SV</u>	<u>Percentage</u>	<u>Allocation</u>
Juice	200,000 @ \$6	\$1,200,000	21.43%	\$132,866
Fresh	300,000 @ \$8	2,400,000	42.86%	\$265,732
Frozen	<u>400,000 @ \$5</u>	<u>2,000,000</u>	<u>35.71%</u>	<u>\$221,402</u>
Totals		\$5,600,000	100.00%	\$620,000

<u>Product</u>	<u>Costs per unit</u>
Juice	\$132,866/200,000 litres = \$0.66/litre
Fresh	\$265,732/300,000 kilograms = \$0.89/kilogram
Frozen	\$221,402/400,000 kilograms = \$0.55/kilogram

Diff: 2 Type: ES

Skill: Apply

Objective: LO 15-2

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

Product	Boardmetres	<u>Sales Value at</u> splitoff Point	<u>Ending Inventory</u>
2 × 4's	6,000,000	\$0.30 per boardmetre	500,000 boardmetre
2 × 6's	3,000,000	0.40 per boardmetre	250,000 boardmetre
4 × 4's	2,000,000	0.45 per boardmetre	100,000 boardmetre
slabs	1,000,000	0.10 per boardmetre	50,000 boardmetre

Required:

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

Answer:

Product	Boardmetres	Weighting	% Joint Cost Allocated
2 × 4's	6,000,000	6,000/12,000	50.0% × 280,000 = \$140,000
2 × 6's	3,000,000	3,000/12,000	25.0% × 280,000 = 70,000
4 × 4's	2,000,000	2,000/12,000	16.67% × 280,000 = 46,676
slabs	<u>1,000,000</u>	<u>1,000/12,000</u>	<u>8.33% × 280,000 = 23,324</u>
Totals	12,000,000	<u>100.0%</u>	<u>\$280,000</u>

Product	Fraction of prod. in inventory	Allocated Inventory value
2 × 4's	500,000/6,000,000 × \$140,000 =	\$11,667
2 × 6's	250,000/3,000,000 × 70,000 =	5,833
4 × 4's	100,000/2,000,000 × 46,676 =	2,334
slabs	50,000/1,000,000 × 23,324 =	<u>1,166</u>
Total		<u>\$21,000</u>

Diff: 3 Type: ES

Skill: Apply

Objective: LO 15-2

56) CSI 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 were as follows:

<u>Product</u>	<u>Units Produced</u>	<u>Sales Value at splitoff Point</u>
Turpentine	3,000 litres	\$30,000
Paint thinner	3,000 litres	25,000
Spot remover	1,500 litres	12,500

Required:

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

Answer:

<u>Product</u>	<u>Sales Value</u>	<u>Percentage</u>	<u>Joint costs Allocated</u>
Turpentine	\$30,000	44.44% × \$240,000 =	\$106,667
Paint thinner	\$25,000	37.04% × \$240,000 =	88,889
Spot remover	<u>\$12,500</u>	<u>18.52% × \$240,000 =</u>	<u>44,444</u>
Totals	\$67,500	100%	<u>\$240,000</u>

Diff: 2 Type: ES

Skill: Apply

Objective: LO 15-2

57) 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: 2 Type: ES

Skill: Remember

Objective: LO 15-2

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. 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: 3 Type: ES

Skill: Evaluate

Objective: LO 15-2

59) Paragon University operates an extensive and an expensive registration, testing, and counselling centre, 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 centre 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 centre.

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 Type: ES

Skill: Evaluate

Objective: LO 15-2

15.3 Evaluate two different market-cost methods to identify which is most appropriate.

1) The method of allocating joint product costs is an important guide for other management decisions.

Answer: FALSE

Explanation: Not true as joint costs do not have a cause and effect relationship to separable products.

Diff: 2 Type: TF

Skill: Understand

Objective: LO 15-3

2) The estimated net realizable value method allocates joint costs on the basis of the expected final sales value in the ordinary course of business, less the expected separable costs of production and marketing of the total production for the period.

Answer: TRUE

Diff: 1 Type: TF

Skill: Remember

Objective: LO 15-3

3) The net realizable value method can be used for products for which there may not be any market price available at splitoff.

Answer: TRUE

Diff: 2 Type: TF

Skill: Remember

Objective: LO 15-3

4) Net realizable value generally means expected sales value plus expected separable costs.

Answer: FALSE

Explanation: Net realizable value is expected sales value minus expected separable costs.

Diff: 1 Type: TF

Skill: Remember

Objective: LO 15-3

5) A company can alter its total gross margin through its selection of joint cost allocation methods.

Answer: FALSE

Explanation: Individual product margins are affected, not the total company.

Diff: 2 Type: TF

Skill: Understand

Objective: LO 15-3

6) 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 Type: TF

Skill: Remember

Objective: LO 15-3

7) 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 Type: TF

Skill: Understand

Objective: LO 15-3

8) 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 Type: TF

Skill: Understand

Objective: LO 15-3

9) The constant gross margin percentage of 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 of 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 Type: TF

Skill: Remember

Objective: LO 15-3

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

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

Answer: C

Diff: 2 Type: MC

Skill: Remember

Objective: LO 15-3

11) Which of the following is NOT a strategy for costing inventory when joint-cost circumstances are involved?

- A) Allocate costs according to the market selling price.
- B) Allocate costs based on constant gross margin.
- C) Allocate costs according to a predetermined physical measure.
- D) Use the estimated net realizable value.
- E) Allocate costs according to the amount in the respective cost pools.

Answer: E

Diff: 2 Type: MC

Skill: Remember

Objective: LO 15-3

12) The decision of whether to process products beyond the splitoff process should be based on which of the following?

- A) revenue analysis
- B) relevant cost analysis
- C) production cost analysis
- D) gross margin analysis
- E) incremental operating income attainable beyond the splitoff point

Answer: E

Diff: 2 Type: MC

Skill: Understand

Objective: LO 15-3

13) The estimated net realizable method allocates joint costs on the basis of

- A) expected final sales value less separable costs of production and marketing.
- B) value added after the splitoff point.
- C) sales value less value added after the splitoff point.
- D) revenue less all direct manufacturing costs after splitoff point.
- E) relative numbers of physical units of each product.

Answer: A

Diff: 1 Type: MC

Skill: Understand

Objective: LO 15-3

Use the information below to answer the following question(s).

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 litres (with 20 percent shrinkage)

Production:	A	1,500 litres
	B	500 litres
Unit sales value at splitoff:	A	\$15.00 per litre
	B	\$10.00 per litre

Cost of purchasing 2,500 litres of direct materials and processing it up to the splitoff point to yield a total of 2,000 litres 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 litres of Product Z5 for an additional processing cost of \$150. Product Z5 is sold for \$25.00 per litre. There was no beginning inventory and ending inventory was 125 litres.

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

14) What are the expected final sales values of production if Product Z5 and Product W3 are produced?

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

Answer: E

Explanation: E) Z5 = 1,375 litres × \$25 = \$34,375

W3 = 375 litres × \$30 = \$11,250

Diff: 1 Type: MC

Skill: Apply

Objective: LO 15-3

15) What is Product Z5's estimated net realizable value?

- A) \$11,100
- B) \$22,350
- C) \$34,225
- D) \$34,375
- E) \$34,525

Answer: C

Explanation: C) \$34,375 - \$150 = \$34,225

Diff: 2 Type: MC

Skill: Apply

Objective: LO 15-3

16) What is Product Z5's and Product W3's respective production cost per unit, assuming the company allocates joint costs on the basis of net realizable value?

- A) \$2.05 and \$3.88
- B) \$2.42 and \$2.78
- C) \$2.49 and \$2.88
- D) \$2.60 and \$3.61
- E) \$2.86 and \$3.68

Answer: D

Explanation: D) Weight $(34,225/45,200) = 76\%$
 $(10,975/45,200) = 24\%$

Joint Cost:

$$0.76 \times \$4,500 = \$3,420$$

$$0.24 \times \$4,500 = \$1,080$$

Prod. Cost/unit:

$$[(\$3,420 + 150)/1,375] = \$2.60$$

$$[(\$1,080 + 275)/375] = \$3.61$$

Diff: 3 Type: MC

Skill: Apply

Objective: LO 15-3

17) Which of the following methods allocates joint costs according to the appraised final sales value in the ordinary course of business less the appraised separable costs of production and marketing?

- A) constant gross margin percentage NRV method
- B) estimated net realizable method
- C) physical measure method
- D) sales value at splitoff method
- E) splitoff appraisal method

Answer: B

Diff: 1 Type: MC

Skill: Remember

Objective: LO 15-3

18) Which of the following joint cost allocation methods calculates expected profits before any costs are allocated?

- A) sales value at splitoff method
- B) physical measure method
- C) expected profits method
- D) estimated net realizable method
- E) constant gross margin percentage of NRV method

Answer: E

Diff: 2 Type: MC

Skill: Remember

Objective: LO 15-3

19) All of the following statements about the constant gross margin percentage of net realizable method are true EXCEPT

- A) all products have equal gross margin percentages.
- B) it is based on a tenuous underlying assumption.
- C) the gross margin percentage remains the same regardless of the different amounts of separable costs.
- D) the gross margin is calculated by deducting all separable costs from revenue.
- E) some products may receive negative allocations of joint costs.

Answer: D

Diff: 2 Type: MC

Skill: Understand

Objective: LO 15-3

20) Which of the following statements is TRUE concerning the practice of carrying inventories at NRV?

- A) It is an inevitable result of joint cost allocation.
- B) It results for the NRV method of joint cost allocation.
- C) It results from the constant gross margin of NRV method.
- D) It is a widely accepted practice.
- E) It results in income recognition before sales are made.

Answer: E

Diff: 2 Type: MC

Skill: Understand

Objective: LO 15-3

Answer the following question(s) using the information below:

The Morton 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: 65,000 litres (shrinkage was 10%)

Production:	condensed goat milk	26,100 litres
	skim goat milk	32,400 litres
Sales:	condensed goat milk	\$3.50 per litre
	skim goat milk	\$2.50 per litre

The costs of purchasing the 65,000 litres of unprocessed goat milk and processing it up to the splitoff point to yield a total of 58,500 litres of salable product was \$72,240. There were no inventory balances of either product.

Condensed goat milk may be processed further to yield 19,500 litres (the remainder is shrinkage) of a medicinal milk product, Xyla, for an additional processing cost of \$3 per usable litre. Xyla can be sold for \$18 per litre.

Skim goat milk can be processed further to yield 28,100 litres of skim goat ice cream, for an additional processing cost per usable litre of \$2.50. The product can be sold for \$9 per litre.

There are no beginning and ending inventory balances.

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

- A) \$182,650
- B) \$252,900
- C) \$292,500
- D) \$351,000
- E) \$280,750

Answer: C

Explanation: C)

	Xyla	Skim Goat	Total
Sales	$19,500 \times \$18 = \$351,000$	$28,100 \times \$9 = \$252,900$	\$603,900
Less: Sep cost	$19,500 \times \$3 = \$58,500$	$28,100 \times \$2.50 = \$70,250$	
Est. NRV	<u>\$292,500</u>	<u>\$182,650</u>	\$475,150
Weighting	.6156	.3844	
It costs allocated	$\$72,240 \times .6156 = \$44,471$	$\$72,240 \times .3844 = \$27,769$	

Diff: 2 Type: MC

Skill: Apply

Objective: LO 15-3

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

- A) \$182,650
- B) \$252,900
- C) \$110,200
- D) \$85,450
- E) \$194,400

Answer: A

Explanation: A)

	XYLA	Skim Goat	Total
Sales	$19,500 \times \$18 = \$351,000$	$28,100 \times \$9 = \$252,900$	\$603,900
Less: Sep cost	$19,500 \times \$3 = \underline{\$58,500}$	$28,100 \times \$2.50 = \underline{\$70,250}$	
Est. NRV	<u>\$292,500</u>	<u>\$182,650</u>	\$475,150
Weighting	.6156	.3844	
Joint costs allocated	$\$72,240 \times .6156 = \$44,471$	$\$72,240 \times .3844 = \$27,769$	

Diff: 2 Type: MC

Skill: Apply

Objective: LO 15-3

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) \$41,971 and \$30,269
- B) \$44,471 and \$27,769
- C) \$32,796 and \$39,444
- D) \$36,120 and \$36,120
- E) \$39,444 and \$32,796

Answer: B

Explanation: B)

	XYLA	Skim Goat	Total
Sales	$19,500 \times \$18 = \$351,000$	$28,100 \times \$9 = \$252,900$	\$603,900
Less: Sep cost	$19,500 \times \$3 = \underline{\$58,500}$	$28,100 \times \$2.50 = \underline{\$70,250}$	
Est. NRV	<u>\$292,500</u>	<u>\$182,650</u>	\$475,150
Weighting	.6156	.3844	
Joint costs allocated	$\$72,240 \times .6156 = \$44,471$	$\$72,240 \times .3844 = \$27,769$	

Diff: 3 Type: MC

Skill: Apply

Objective: LO 15-3

- 24) 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.
 - E) will result in different gross margins for each product.

Answer: B

Diff: 2 Type: MC

Skill: Remember

Objective: LO 15-3

- 25) 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) net margin method
- E) reciprocal method

Answer: B

Diff: 2 Type: MC

Skill: Understand

Objective: LO 15-3

- 26) What is the reason that accountants do not like to carry inventory at net realizable value?

- A) it is the most difficult costing method
- B) income is recognized after the sale is complete
- C) income is recognized before sales are made
- D) it is never acceptable to the taxing authorities
- E) it is more difficult to count the inventory when carrying cost is different than purchase cost

Answer: C

Diff: 2 Type: MC

Skill: Remember

Objective: LO 15-3

Use the information below to answer the following question(s).

Cranbrook Chemical Ltd. manufactures two industrial compounds. In the month of May, 15,000 litres of direct material costing \$160,000 were processed at a cost of \$400,000. The joint process yielded 16,000 containers of a compound known as Jarlon and 4,000 containers of a compound known as Kharton. The respective selling prices of Jarlon and Kharton are \$38 and \$58. Both products may be processed further. Jarlon may be processed into Jaxton at an incremental cost of \$8 per jar of the final product while Kharton may be processed into Kraxton at an additional cost of \$32 per jar of the final product. The volume of jars of the final product are: 12,000 and 3,000 for Jaxton and Kraxton respectively. The selling price of Jaxton is \$48 per jar. The selling price of Kraxton is \$102 per jar.

27) Using the NRV method, the amount of joint costs allocated to Jaxton is

- A) \$170,408.
- B) \$278,280.
- C) \$121,720.
- D) \$389,592.
- E) \$111,312.

Answer: D

Explanation: B) includes only processing costs, no direct material

D) Jaxton net realizable value = $[12,000 * \$48] - [12,000 * \$8] = \$480,000$

Kraxton net realizable value = $[3,000 * \$102] - [3,000 * \$32] = \$210,000$

J proportion = $\$480,000 / [\$480,000 + \$210,000] = 69.57\%$

K proportion = $\$210,000 / [\$480,000 + \$210,000] = 30.43\%$

Joint costs allocated to J = $.6957 * \$560,000 = \$389,592$

Joint costs allocated to K = $.3043 * \$560,000 = \$170,408$

Diff: 3 Type: MC

Skill: Apply

Objective: LO 15-3

28) Using the NRV method, the amount of joint costs allocated to Kraxton is

- A) \$170,408.
- B) \$278,280.
- C) \$121,720.
- D) \$389,592.
- E) \$111,312.

Answer: A

Explanation: A) Jaxton net realizable value = $[12,000 * \$48] - [12,000 * \$8] = \$480,000$

Kraxton net realizable value = $[3,000 * \$102] - [3,000 * \$32] = \$210,000$

J proportion = $\$480,000 / [\$480,000 + \$210,000] = 69.57\%$

K proportion = $\$210,000 / [\$480,000 + \$210,000] = 30.43\%$

Joint costs allocated to J = $.6957 * \$560,000 = \$389,592$

Joint costs allocated to K = $.3043 * \$560,000 = \$170,408$

Diff: 3 Type: MC

Skill: Apply

Objective: LO 15-3

29) The incremental benefit or (loss) of processing Jarlon into Jaxton is

- A) \$480,000.
- B) (\$128,000).
- C) \$64,000.
- D) (\$96,000).
- E) (\$32,000).

Answer: B

Explanation: B) Incremental Revenues: $[12,000 * \$48] - [16,000 * \$38] = \$576,000 - \$608,000 = (\$32,000)$

Incremental Costs: $[12,000 * \$8] = \$96,000$

Company loses $\$32,000 + \$96,000 = \$128,000$

Diff: 3 Type: MC

Skill: Analyze

Objective: LO 15-3

30) The incremental benefit or (loss) of processing Kharton into Kraxton is

- A) \$74,000.
- B) \$22,000.
- C) (\$22,000).
- D) (\$96,000).
- E) \$170,000.

Answer: C

Explanation: C) Incremental Revenues: $[3,000 * \$102] - [4,000 * \$58] = \$306,000 - \$232,000 = \$74,000$

Incremental Costs: $[3,000 * \$32] = (\$96,000)$

Company loses $\$74,000 - \$96,000 = (\$22,000)$

Diff: 3 Type: MC

Skill: Analyze

Objective: LO 15-3

Use the information below to answer the following question(s):

Orange Paper Company processes wood pulp into two products. During February the joint costs of processing were \$156,000. Production and sales value information for the month were as follows:

Product	Kilograms Produced	Sales Value at splitoff Point	Separable Costs
Paper	180,000	\$30,000	\$232,000
Cardboard	132,000	20,000	277,000

Paper sells for \$2.85 a kilogram and cardboard sells for \$3.90 a kilogram.

There were no beginning inventories for April but ending inventories totalled 15,000 kilograms for paper and 18,000 kilograms for cardboard.

31) How much of the Orange Paper Company joint costs should be allocated to the cardboard using the net realizable value method based on total production?

- A) \$78,000
- B) \$62,400
- C) \$93,600
- D) \$84,240
- E) \$71,760

Answer: E

Explanation: E) Joint cost allocated:

NRV paper = $(180,000 \times \$2.85) - \$232,000 =$	\$ 281,000	54%
NRV cardboard = $(132,000 \times \$3.90) - \$277,000 =$	<u>237,800</u>	46%
Total	<u>\$518,800</u>	

Joint cost allocated to paper = $\$156,000 \times 0.54 =$ \$ 84,240

Joint cost allocated to cardboard = $\$156,000 \times 0.46 =$ 71,760

Total \$156,000

Diff: 3 Type: MC

Skill: Apply

Objective: LO 15-3

32) How much of the Orange Paper Company joint costs should be allocated to the paper using the net realizable value method based on total production?

- A) \$78,000
- B) \$62,400
- C) \$93,600
- D) \$84,240
- E) \$71,760

Answer: D

Explanation: D) Joint cost allocated:

NRV paper = $(180,000 \times \$2.85) - \$232,000 =$	\$ 281,000	54%
NRV cardboard = $(132,000 \times \$3.90) - \$277,000 =$	<u>237,800</u>	46%
Total	<u>\$518,800</u>	

Joint cost allocated to paper = $\$156,000 \times 0.54 =$	\$ 84,240
Joint cost allocated to cardboard = $\$156,000 \times 0.46 =$	<u>71,760</u>
Total	<u>\$156,000</u>

Diff: 3 Type: MC

Skill: Apply

Objective: LO 15-3

33) What will be the total incremental benefit or (loss) from all potential sales of processing the paper beyond the splitoff point?

- A) \$251,000
- B) \$281,000
- C) \$513,000
- D) \$311,000
- E) \$232,000

Answer: A

Explanation: A) Incremental Revenues: $[180,000 \times \$2.85] - \$30,000 - \$232,000 = \$251,000$

Diff: 3 Type: MC

Skill: Analyze

Objective: LO 15-3

34) What will be the total incremental benefit or (loss) from all potential sales of processing the cardboard beyond the splitoff point?

- A) \$257,800
- B) \$237,800
- C) \$217,800
- D) \$311,000
- E) \$277,000

Answer: C

Explanation: C) Incremental Revenues: $(132,000 \times \$3.90) - \$20,000 - \$277,000 = \$217,800$

Diff: 3 Type: MC

Skill: Analyze

Objective: LO 15-3

35) Blue Paper Company processes wood pulp into two products. During January the joint costs of processing were \$144,000. Production and sales value information for the month were as follows:

Product	Kilograms Produced	Sales Value at splitoff Point	Separable Costs
Paper	130,000	\$80,000	\$224,000
Cardboard	108,000	70,000	264,000

Paper sells for \$2.75 a kilogram and cardboard sells for \$3.50 a kilogram.

There were no beginning inventories for January but ending inventories totalled 10,000 kilograms for paper and 12,000 kilograms for cardboard.

Required:

Prepare a product line income statement in gross margin format. Joint costs are allocated using the net realizable value method assuming all available product is sold.

Answer:

	<u>Paper</u>	<u>Cardboard</u>	<u>Totals</u>
Sales	\$330,000	\$336,000	\$666,000
Cost of goods sold	<u>278,548</u>	<u>293,547</u>	<u>572,095</u>
Gross margin	<u>\$51,452</u>	<u>\$42,453</u>	<u>\$93,905</u>

Joint cost allocated:

NRV paper = $(130,000 \times \$2.75) - \$224,000 =$	\$ 133,500	54%
NRV cardboard = $(108,000 \times \$3.50) - \$264,000 =$	<u>114,000</u>	46%
Total	<u>\$247,500</u>	

Joint cost allocated to paper = $\$144,000 \times 0.54 =$	\$ 77,760
Joint cost allocated to cardboard = $\$144,000 \times 0.46 =$	<u>66,240</u>
Total	<u>\$144,000</u>

Cost of goods sold:

Paper = $[(\$77,760 + \$224,000)/130,000 \text{ kg.}] \times (130,000 \text{ kg.} - 10,000 \text{ kg.}) =$	\$ 278,548
Cardboard = $[(\$66,240 + \$264,000)/108,000 \text{ kg.}] \times (108,000 \text{ kg.} - 12,000 \text{ kg.}) =$	\$ 293,547

Diff: 3 Type: ES

Skill: Analyze

Objective: LO 15-3

36) Red Paper Company processes wood pulp into two products. During March the joint costs of processing were \$144,000. Production and sales value information for the month were as follows:

Product	Kilograms Produced	Sales Value at splitoff Point	Separable Costs
Paper	130,000	\$80,000	\$224,000
Cardboard	108,000	70,000	264,000

Paper sells for \$2.75 a kilogram and cardboard sells for \$3.50 a kilogram.

There were no beginning inventories for March but ending inventories totalled 10,000 kilograms for paper and 12,000 kilograms for cardboard.

Required:

Prepare a product line income statement assuming that joint costs are allocated on the constant gross margin percentage method based on total production. Present production costs and separable costs individually.

Answer:

	Paper	Cardboard	Totals
Sales	\$330,000	\$336,000	\$666,000
Produced but not sold	<u>27,500</u>	<u>42,000</u>	<u>69,500</u>
Total sales value	\$357,500	\$378,000	\$735,500
Separable costs	<u>224,000</u>	<u>264,000</u>	<u>488,000</u>
Contribution margin	<u>\$133,500</u>	<u>\$114,000</u>	\$247,500
Joint costs			<u>144,000</u>
Gross margin			<u>\$103,500</u>

Gross margin % = $\$103,500 / \$735,500 = 14.072\%$

	Paper	Cardboard	Totals
Sales	\$330,000	\$336,000	\$666,000
Cost of goods sold:			
Production costs (plugged)	76,793	54,051	130,844
Separable costs	<u>206,769</u>	<u>234,667</u>	<u>441,436</u>
Gross margin @ 14.072%	<u>\$ 46,438</u>	<u>\$ 47,282</u>	<u>\$ 93,720</u>

Separable costs:

Paper = $(\$224,000 / 130,000 \text{ kg.}) \times (130,000 \text{ kg.} - 10,000 \text{ kg.}) =$ \$206,769

Cardboard = $(\$264,000 / 108,000 \text{ kg.}) \times (108,000 \text{ kg.} - 12,000 \text{ kg.}) =$ \$ 234,667

Diff: 3 Type: ES

Skill: Analyze

Objective: LO 15-3

37) Orange Paper Company processes wood pulp into two products. During April the joint costs of processing were \$132,000. Production and sales value information for the month were as follows:

Product	Kilograms Produced	Sales Value at splitoff Point	Separable Costs
Paper	135,000	\$55,000	\$217,000
Cardboard	98,000	40,000	259,000

Paper sells for \$2.65 a kilogram and cardboard sells for \$3.40 a kilogram.

There were no beginning or ending inventories for April.

Required:

- Determine the amounts to be allocated to each product using the:
 - estimated net realizable value method
 - sales value at splitoff method
- If the cardboard is sold at the splitoff point then the post splitoff factory capacity can be renovated and leased for the year. The cost of the renovation is budgeted at \$125,000 and the annual lease revenue will be \$165,000. Determine if it is more profitable for the cardboard to be sold at the splitoff point or at the end of production.

Answer: 1 (a) NRV method joint cost allocated:

NRV paper = $(135,000 \times \$2.65) - \$217,000 =$	\$ 140,750	65%
NRV cardboard = $(98,000 \times \$3.40) - \$259,000 =$	<u>74,200</u>	35%
Total	<u>\$214,950</u>	
Joint cost allocated to paper = $\$132,000 \times 0.65 =$	\$ 85,800	
Joint cost allocated to cardboard = $\$132,000 \times 0.35 =$	<u>46,200</u>	
Total	<u>\$132,000</u>	

1(b) Sales value at splitoff method joint cost allocated:

Paper = $[\$55,000 / (\$55,000 + \$40,000)] \times \$132,000 =$	\$ 76,421
Cardboard = $[\$40,000 / (\$55,000 + \$40,000)] \times \$132,000 =$	<u>55,579</u>
	<u>\$132,000</u>

2. Sell or process further

Sales value at splitoff	\$40,000
Net lease ($\$165,000 - \$125,000$)	<u>40,000</u>
	<u>\$80,000</u>

$$\text{NRV cardboard} = (98,000 \times \$3.40) - \$259,000 = \underline{\underline{\$ 74,200}}$$

Therefore, sell at the splitoff point.

Diff: 3 Type: ES

Skill: Analyze

Objective: LO 15-2, 3 and 11-2

38) Purple Paper Company processes wood pulp into two products. During July the joint costs of processing were \$50,000. Production and sales value information for the month were as follows:

Product	Kilograms Produced	Sales Value at splitoff Point	Separable Costs
Paper	125,000	\$63,000	\$221,000
Cardboard	96,000	46,000	262,000

Paper sells for \$2.71 a kilogram and cardboard sells for \$3.10 a kilogram.

There were no beginning or ending inventories for July.

Required:

- Determine the amounts to be allocated to each product using the:
 - constant gross margin percentage of NRV method
 - physical measure method
- Should management process these products beyond the splitoff point? Justify your answer. Also comment on how this decision would be affected by the results of the expected profits using the constant gross margin percentage of NRV and physical measure methods.

Answer:

- (a) Constant gross margin method joint cost allocated:

	Paper	Cardboard	Totals
Sales	\$338,750	\$297,600	\$636,350
Separable costs	<u>221,000</u>	<u>262,000</u>	<u>483,000</u>
Contribution margin	<u>\$117,750</u>	<u>\$35,600</u>	\$153,350
Joint costs			<u>50,000</u>
Gross margin			<u>\$103,350</u>
Gross margin % = \$103,350/\$636,350 = 16.241%			

	Paper	Cardboard	Totals
Sales	\$338,750	\$297,600	\$636,350
Deduct gross margin	55,017	48,333	103,350
Separable costs	<u>221,000</u>	<u>262,000</u>	<u>483,000</u>
Joint cost allocated	<u>\$ 62,733</u>	<u>\$ (12,733)</u>	<u>\$ 50,000</u>

- (b) Physical measures method joint cost allocated:

$$\begin{aligned} \text{Paper} &= [125,000 / (125,000 + 96,000)] \times \$50,000 = && \$ 28,281 \\ \text{Cardboard} &= [96,000 / (125,000 + 96,000)] \times \$50,000 = && \underline{21,719} \\ &&& \underline{\$ 50,000} \end{aligned}$$

- The paper product has a post splitoff CM of \$117,750 which is greater than the \$63,000 sales value at the splitoff point so processing should continue. The \$35,600 contribution margin for the cardboard is less than the \$46,000 sales value at the splitoff point so further processing will result in less profit.

Using the constant gross margin method management will decide to continue processing because both products show a gross margin of 16.241%.

Using the physical measures method the budgeted paper profit is (\$117,750 - \$28,281 = \$89,469); and, the budgeted cardboard profit is (\$35,600 - \$21,719 = \$13,881, so management will decide to continue processing.

Diff: 3 Type: ES

Skill: Evaluate

Objective: LO 15-2, 3, 4

39) Red Sauce Canning Company processes tomatoes into catsup, tomato juice, and canned tomatoes. During the summer 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 were 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 value	Separable	Net 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	<u>2,000,000</u>	500,000	1,500,000	<u>21.43</u>
Totals	\$7,000,000			100.00%

Product	Joint Costs	Allocated	Separable	Product costs
Catsup	\$420,000	= \$149,982	+ \$300,000	= \$449,982
Juice	420,000	= 180,012	+ 750,000	= 930,012
Canned	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 Type: ES

Skill: Apply

Objective: LO 15-3

40) AllCanada Wire Products processes copper into wire. It makes 12 gauge and 14 gauge wire. During April the joint costs of processing the aluminium were \$365,000. There were no beginning or ending inventories for the month. Production and sales value information for the month were as follows:

Product	Feet	Separable Costs	Selling Price
14 gauge	200,000	\$0.20 per metre	\$0.90 per metre
16 gauge	600,000	0.30 per metre	1.00 per metre

Required:

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

Answer: Expected sales:

14 gauge 200,000 × \$0.90	\$180,000	
16 gauge 600,000 × \$1.00	<u>600,000</u>	
Total sales		780,000
Costs:		
Joint	\$365,000	
14 gauge (200,000 × \$0.20)	40,000	
16 gauge (600,000 × \$0.30)	<u>180,000</u>	<u>585,000</u>
Gross margin		\$195,000

gross margin percentage $\$195,000/\$780,000 = 0.25$

	<u>14 gauge</u>	<u>16 gauge</u>	<u>Totals</u>
Sales	\$180,000	\$600,000	\$780,000
Less gross margin (0.25)	<u>45,000</u>	<u>150,000</u>	<u>195,000</u>
Cost of goods sold	\$135,000	\$450,000	\$585,000
Separable costs	<u>40,000</u>	<u>180,000</u>	<u>220,000</u>
Joint costs allocated	\$95,000	\$270,000	\$365,000

Diff: 3 Type: ES

Skill: Apply

Objective: LO 15-3

41) Favata Corporation processes a single material into three separate products A, B, and C . During September, the joint costs of processing were \$600,000. Production and sales value information for the month were as follows:

Product	Units Produced	Final Sales Value per Unit	Separable Costs
A	20,000	\$25	\$250,000
B	30,000	30	500,000
C	25,000	24	250,000

Required:

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

Answer: The gross margin percentage is 20% $(\$2,000,000 - \$1,600,000)/\$2,000,000$

Product	Final Sales Value	Less Gross Margin	Total Production Costs	Less Separable Costs	Joint Costs Allocated
A	\$500,000	\$100,000	\$400,000	\$250,000	\$150,000
B	900,000	180,000	720,000	500,000	220,000
C	600,000	120,000	480,000	250,000	230,000
Total	2,000,000	400,000	1,600,000	\$1,000,000	600,000

Diff: 2 Type: ES

Skill: Analyze

Objective: LO 15-3

42) Juno Ltd. manufactures three separate products Q, R, and S from a joint production process . During March, the joint costs of processing were \$875,000. Production and sales value information for the month were as follows:

Product	Units Produced	Final Sales Value per Unit	Separable Costs
Q	42,000	\$18	\$190,000
R	68,000	32	720,000
S	35,000	26	210,000

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 48.07391% $(\$3,842,000 - \$875,000 - \$1,120,000)/\$3,842,000 = \$1,847/\$3,842$

Product	Final Sales Value	Less Gross Margin	Total Production Costs	Less Separable Costs	Joint Costs Allocated
Q	\$756,000	\$363,439	\$392,561	\$190,000	\$202,561
R	\$2,176,000	\$1,046,088	\$1,129,912	720,000	409,912
S	\$910,000	\$437,470	472,527	210,000	262,527
Total	\$3,842,000	400,000	1,995,000	\$1,120,000	875,000

Diff: 2 Type: ES

Skill: Analyze

Objective: LO 15-3

43) 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 of 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 Type: ES

Skill: Apply

Objective: LO 15-3

44) 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 Type: ES

Skill: Understand

Objective: LO 15-3

45) 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: 3 Type: ES

Skill: Understand

Objective: LO 15-2, 3

15.4 Understand the irrelevance of joint costs in the sell or process further decision.

1) The amount of the joint costs is an important factor when considering to sell a product at the splitoff point or process it further.

Answer: FALSE

Explanation: When a product is an inevitable result of a joint process, the decision to further process should not be influenced by either the size of the total joint costs, or by the portion of joint costs allocated to particular products.

Diff: 2 Type: TF

Skill: Remember

Objective: LO 15-4

2) 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 Type: TF

Skill: Understand

Objective: LO 15-4

3) 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 net operating income earned past the splitoff point.
- E) joint costs allocated under the NRV method.

Answer: D

Diff: 2 Type: MC

Skill: Understand

Objective: LO 15-4

4) North York Statue Company makes miniature Mountie statues from cast iron. Sales total 40,000 units a year and the company is operating at full capacity. The statues are finished either rough or polished, with an average demand of 60 percent rough and 40 percent polished. Iron ingots, the direct material, costs \$6 per kilogram. Processing costs are \$200 to convert 20 kilograms into 40 statues; polishing adds \$3 per statue. Rough statues are sold for \$15 each and polished statues can be sold for \$18 or engraved for an additional cost of \$5. Engraved statues can then be sold for \$30.

Required:

Determine if the engraving process is cost effective.

Answer: $(\$30 - \$18) - \$5 = \7 incremental margin

	<u>Rough</u>	<u>Polished</u>	<u>Engraved</u>
Sales	\$15.00	\$18.00	\$30.00
Cost of sales:			
Materials $(\$6 \times 20)/40$	\$3.00	\$3.00	\$3.00
Conversion $\$200/40$	<u>5.00</u>	<u>8.00</u>	8.00
Engraving			<u>5.00</u>
Contribution margin	<u>\$7.00</u>	<u>\$7.00</u>	<u>\$14.00</u>

Diff: 2 Type: ES

Skill: Apply

Objective: LO 15-4

15.5 Identify the strategic implications of a decision to implement one joint cost allocation method.

1) Different joint cost allocation methods will result in different product margin percentages for the individual products.

Answer: TRUE

Diff: 2 Type: TF

Skill: Understand

Objective: LO 15-5

2) If managers make processing or selling decisions using incremental revenue/incremental cost approach, which of the following statements is TRUE?

- A) The resulting budgeted product-line income statement under the sales value at splitoff method, will show each product to have a positive operating income.
- B) The resulting budgeted product-line income statement under the physical measure method, will show each product to have a positive operating income.
- C) The resulting budgeted product-line income statement under the constant gross margin NRV method, will show each product to have a positive (or zero) operating income.
- D) Estimated net realizable method the resulting budgeted product-line income statement under the estimated NRV method, will show each product to have a zero operating income.
- E) The resulting budgeted product-line income statement under the sales value at splitoff method, will show each product to have a negative operating income.

Answer: C

Diff: 2 Type: MC

Skill: Understand

Objective: LO 15-5

3) The selection of a joint cost allocation method assists managers in which of the following decisions?

- A) allocating inventoriable costs
- B) total cost minimization
- C) joint costs minimization
- D) adding or dropping a product line
- E) sell or process further

Answer: A

Diff: 2 Type: MC

Skill: Understand

Objective: LO 15-5

4) Framingham Ltd. produces three products out of a common process. The company currently uses the physical measures method to allocate joint costs to the three product lines: Leonid (L), Madagascar, (M) and Napoleon (N). The manager of the Napoleon product line is particularly disgruntled. He believes that his product line is allocated a disproportionate share of joint costs. In a recent managers' meeting, he argued that the company should consider using sales value as splitoff as the joint cost allocation method. He stated that his product is sold in a highly competitive market and increasing price is not an option. The manager of the Leonid product line disagreed strongly. He stated that all products are sold in a competitive market place and that allocating joint costs on physical measures was simple and easily verifiable. The manager of the Madagascar product line sat quietly through the meeting and she did not seem to favour one method over the other.

As the assistant controller, you were asked by the controller to look into the concerns of the product line managers. The following additional information is available:

<u>Product Line</u>	<u>Physical Volume</u>	<u>Unit Selling Price</u>
Leonid	10,000 units	\$79.20
Madagascar	12,000 units	\$36.00
Napoleon	18,000 units	\$20.00

Joint costs for the company are \$950,000.

Required:

As the assistant controller, prepare a report to the controller.

Answer: The instruction in the required is deliberately non-directive. Instructors may choose to include additional instructions.

In this case we have a situation where the physical measures method, because it is based on the volume of units, allocates most of the joint costs to the Napoleon line, despite its relatively low selling price and hence sales value. The Napoleon manager would prefer to see an "ability to bear" criterion used; this would result in lower joint cost allocations to his division and higher joint cost allocations to the Leonid product line. Although the Leonid product line has 44% fewer units than the Napoleon product line [(8,000)/18,000], its sales value is 2.2 times [\$792,000/\$360,000] higher.

We have no information to indicate why the physical measures method was selected by this company, perhaps it was because of its simplicity and verifiability. Perhaps the market prices of products fluctuate and the physical measures method has more stability. The following tables present the joint cost allocations and the gross margin percentage calculations for the three product lines under each of the methods.

Joint cost allocation under the physical measures method.

<u>Product Line</u>	<u>Physical Volume</u>	<u>Percentage</u>	<u>Joint Costs Allocated</u>	
	Leonid	10,000 units	25%	\$237,500
	Madagascar	12,000 units	30%	\$285,000
	Napoleon	<u>18,000 units</u>	<u>45%</u>	<u>\$427,500</u>
Totals	40,000 units	100%		\$950,000

Gross margins:

L: $\$792,000 - \$237,500 = \$554,500$ GM% = $\$554,500/\$792,000 = 70\%$

M: $\$432,000 - \$285,000 = \$147,000$ GM% = $\$147,000/\$432,000 = 34\%$

N: $\$360,000 - \$427,500 = (\$67,500)$ GM% = $(\$67,500)/\$360,000 = (18.75\%)$

Joint cost allocation under the sales value at splitoff method.

<u>Product Line</u>	<u>Sales Value</u>	<u>Percentage</u>	<u>Joint Costs Allocated</u>
Leonid	$10,000 * \$79.20 = \$792,000$	50.00%	\$475,000
Madagascar	$12,000 * \$36.00 = \$432,000$	27.27%	\$259,065
Napoleon	<u>$18,000 * \\$20.00 = \\$360,000$</u>	<u>22.73%</u>	<u>\$215,935</u>
Totals	\$1,584,000	100.00%	\$950,000

L: $\$792,000 - \$475,000 = \$317,000$ GM% = $\$317,000/\$792,000 = 40\%$

M: $\$432,000 - \$259,065 = \$172,935$ GM% = $\$172,935/\$432,000 = 40\%$

N: $\$360,000 - \$215,935 = \$144,065$ GM% = $\$144,065/\$360,000 = 40\%$

From the gross margin calculations, we can see why the Napoleon manager does not favour the current system. His product line is showing a loss. Issues that students can raise in responding to this open ended question include:

Criteria for allocation (Chapters 14 & 15)

Purposes of the cost allocation (Chapters 14 & 15)

Links to budgeting and performance evaluation and reward systems (Chapters 6 & 24, primary)

Target costing and pricing (Chapter 12)

Diff: 3 Type: ES

Skill: Evaluate

Objective: LO 15-5

15.6 Account for byproducts using two different methods.

1) Byproducts are recognized in the general ledger either at the time of production or at the time of sale.

Answer: TRUE

Diff: 2 Type: TF

Skill: Remember

Objective: LO 15-6

2) Processes that yield joint products always yield byproducts as well.

Answer: FALSE

Diff: 2 Type: TF

Skill: Remember

Objective: LO 15-6

3) Byproduct revenues appear in the income statement as a cost increase to the main product and as a separate item of expense.

Answer: FALSE

Explanation: ...or as a revenue item on the income statement

Diff: 2 Type: TF

Skill: Remember

Objective: LO 15-6

4) Recognition of byproducts in the financial statements at the time of sale usually occurs when the dollar amounts of the byproducts are immaterial.

Answer: TRUE

Diff: 2 Type: TF

Skill: Remember

Objective: LO 15-6

5) 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 Type: TF

Skill: Understand

Objective: LO 15-6

6) 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 Type: TF

Skill: Remember

Objective: LO 15-6

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

Answer: TRUE

Diff: 2 Type: TF

Skill: Remember

Objective: LO 15-6

8) Recognizing byproduct cost at the time of sale is based on the matching principle.

Answer: FALSE

Explanation: By product costs are not recognized in the accounts when the sales method is used.

Diff: 2 Type: TF

Skill: Understand

Objective: LO 15-6

Use the information below to answer the following question(s).

Troy Company processes 15,000 litres of direct materials to produce two products, Product X and Product Y. Product X, a byproduct, sells for \$4 per litre, and Product Y, the main product, sells for \$50 per litre. 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 totalled \$95,000.

9) How much is the ending inventory for the byproduct if byproducts are recognized in the general ledger when production is completed?

- A) \$0
- B) \$1,500
- C) \$14,375
- D) \$16,000
- E) \$17,500

Answer: B

Explanation: B) 375 litres \times \$4 = \$1,500

Diff: 3 Type: MC

Skill: Apply

Objective: LO 15-6

10) 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) \$16,000
- E) \$17,500

Answer: A

Diff: 2 Type: MC

Skill: Understand

Objective: LO 15-6

11) What is the net effect to the income statement for the sale of byproduct, if byproducts are recognized at the point of sale?

- A) \$0
- B) \$1,500
- C) \$16,000
- D) \$17,500
- E) \$20,000

Answer: C

Explanation: C) $4,000 \text{ litres} \times \$4 = \$16,000$

Diff: 2 Type: MC

Skill: Apply

Objective: LO 15-6

12) What is the net effect to the income statement for the recognition of the byproduct, if byproducts are recognized when production is completed, and the company uses FIFO?

- A) \$17,500
- B) \$16,000
- C) \$16,844
- D) \$17,300
- E) \$16,625

Answer: E

Explanation: E) $(4,375 \times \$4)/10,000 = \1.75 per unit

Current production sold assuming FIFO = $9,625 - 125 = 9,500$

Byproduct revenue recognized as reduction to cost of goods sold = $9,500 \times \$1.75 = \$16,625$

Diff: 3 Type: MC

Skill: Analyze

Objective: LO 15-6

13) Which of the following entries is the initial entry to recognize a byproduct in the general ledger, based on the accounting method of recognizing byproducts at the time of production?

A)

byproduct inventory	500
work in process	500

B)

work in process	500
byproduct inventory	500

C)

byproduct inventory	500
cost of goods sold	500

D)

cost of goods sold	500
byproduct inventory	500

E)

byproduct inventory	500
revenue	500

Answer: A

Diff: 2 Type: MC

Skill: Understand

Objective: LO 15-6

14) 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 are not recorded at the time of production.
- E) No value is attached to the byproduct inventory.

Answer: B

Diff: 2 Type: MC

Skill: Understand

Objective: LO 15-6

15) BC Lumber 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
Shavings	\$480,000	<u>4,080</u>
Total Sales:		484,080
Cost of Goods Sold:		
Total manufacturing costs	\$332,000	\$332,000
Byproduct	<u>4,080</u>	0
Total COGS		<u>332,000</u>
Gross Margin		<u>\$152,080</u>

Diff: 2 Type: ES

Skill: Apply

Objective: LO 15-6

16) Ontario Lumber 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 \$166,000 in total costs. Eighty thousand board metres of lumber were produced and sold along with 6,800 kilograms of shavings. The finished lumber sold for \$3.00 per board metre and the shavings sold for \$0.30 a kilogram. 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 <u>when produced</u>	Revenue <u>when sold</u>
Sales:		
Lumber	\$240,000	\$240,000
Shavings	<u>n/a</u>	<u>2,040</u>
Total sales	<u>\$240,000</u>	<u>\$242,040</u>
Cost of goods sold:		
Total manufacturing costs	\$166,000	\$166,000
Byproduct	<u>2,040</u>	<u>n/a</u>
	<u>163,960</u>	
Gross margin	<u>\$76,040</u>	<u>\$76,040</u>

Diff: 2 Type: ES

Skill: Apply

Objective: LO 15-6

17) Trundle Ltd. produces two main products, J and K; and, a byproduct, L. There were no beginning inventories. During April, it incurred \$275,000 of joint costs, which are allocated to main products using the physical output method. Additional information follows:

<u>Product</u>	<u>Units Produced</u>	<u>Units Sold</u>	<u>Unit Sales Price</u>
J	12,000	9,600	\$22
K	18,000	15,300	38
L	6,000	5,200	3

Required:

Assuming Trundle recognizes byproduct revenue at the time of sale, what is the total value of ending inventory?

Answer: Byproduct revenue = $5,200 * \$3 = \$15,600$

Joint costs to be allocated = \$275,000

J proportion = $12,000 / [12,000 + 18,000] = 40\%$

K proportion = $18,000 / [12,000 + 18,000] = 60\%$

Joints costs allocated to J and K respectively = \$110,00 and \$165,000

Ending inventory of J: $2,400 / 12,000 * \$110,000 = \$22,000$

Ending Inventory of K = $2,700 / 18,000 * \$165,000 = \$24,750$

Total ending inventory = $\$22,000 + \$24,750 = \$46,750$.

Diff: 2 Type: ES

Skill: Apply

Objective: LO 15-2, 6

18) Trundle Ltd. produces two main products, J and K; and, a byproduct, L. There were no beginning inventories. During April, it incurred \$275,000 of joint costs, which are allocated to main products using the physical output method. Additional information follows:

<u>Product</u>	<u>Units Produced</u>	<u>Units Sold</u>	<u>Unit Sales Price</u>
J	12,000	9,600	\$22
K	18,000	15,300	38
L	6,000	5,200	3

Required:

Assuming Trundle recognizes byproduct revenue at the time of production, what is the total value of ending inventory?

Answer: Byproduct revenue = $6,000 * \$3 = \$18,000$

Net joint costs to be allocated = $\$275,000 - \$18,000 = \$257,000$

J proportion = $12,000 / [12,000 + 18,000] = 40\%$

K proportion = $18,000 / [12,000 + 18,000] = 60\%$

Joints costs allocated to J and K respectively = \$102,800 and \$154,200

Ending inventory of J: $2,400 / 12,000 * \$102,800 = \$20,560$

Ending Inventory of K = $2,700 / 18,000 * \$154,200 = \$23,130$

Total ending inventory = $\$20,560 + \$23,130 = \$43,690$

Diff: 2 Type: ES

Skill: Apply

Objective: LO 15-2, 6

19) Helen Company processes 30,000 litres of direct materials to produce two products, Zander and Ifso. Zander, a byproduct, sells for \$5 per litre, and Ifso, the main product, sells for \$70 per litre. The following information is for July:

	<u>Production</u>	<u>Sales</u>	<u>Beginning Inventory</u>	<u>Ending Inventory</u>
Zander	5,500	4,950	0	550
Ifso	11,000	10,600	250	650

The manufacturing costs totalled \$145,000; beginning inventory \$3,000.

Required:

1. Prepare a July income statement assuming that Helen Company recognizes the byproduct net realizable value when production is completed. The company uses FIFO for the inventory flow assumption.
2. Prepare the journal entry to record the byproduct sales.

Answer:

1. Income statement

Sales (10,600 × \$70)		\$ 742,000
Cost of goods sold:		
Beg. inventory	\$ 3,000	
Manufacturing costs	145,000	
Byproduct NRV (5,500 × \$5)	(27,500)	
Cost of goods available	\$ 120,500	
End. inventory (650 × \$10.68)	(6,942)	
Cost of goods sold		<u>113,558</u>
Gross margin		<u>\$ 628,442</u>

Ending inventory cost per unit assuming FIFO = $(\$145,000 - \$27,500)/11,000 = \$10.68$

2. Journal entry

Dr. Cash or A/R (4,950 × \$5)	24,750	
Cr. Byproduct inventory		24,750

Diff: 3 Type: ES

Skill: Apply

Objective: LO 15-6

20) Helen Company processes 30,000 litres of direct materials to produce two products, Zander and Ifso. Zander, a byproduct, sells for \$5 per litre, and Ifso, the main product, sells for \$70 per litre. The following information is for July:

	<u>Production</u>	<u>Sales</u>	<u>Beginning Inventory</u>	<u>Ending Inventory</u>
Zander	5,500	4,950	0	550
Ifso	11,000	10,600	250	650

The manufacturing costs totalled \$145,000; beginning inventory \$3,000.

Required:

1. Prepare a July income statement assuming that Helen Company recognizes the byproduct revenue at the time of sale. The company uses FIFO for the inventory flow assumption.
2. Prepare the journal entry to record the byproduct sales.

Answer:

1. Income statement

Info sales (10,600 × \$70)	\$ 742,000	
Zander sales (4,950 × \$5)	24,750	
Total sales		\$ 766,750
Cost of goods sold:		
Beg. inventory	\$ 3,000	
Manufacturing costs	<u>145,000</u>	
Cost of goods available	\$ 148,000	
End. inventory (650 × \$13.18)	<u>(8,567)</u>	
Cost of goods sold		<u>139,433</u>
Gross margin		<u>\$ 627,317</u>

Ending inventory cost per unit assuming FIFO = \$145,000/11,000 = \$13.18

2. Journal entry

Dr. Cash or A/R (4,950 × \$5)	24,750	
Cr. Byproduct sales revenue		24,750

Diff: 3 Type: ES

Skill: Apply

Objective: LO 15-6

21) Land and Sea Corporation processes frozen chicken. 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 hens. 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 sales 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 with which management feels is best for decision making.

Diff: 3 Type: ES

Skill: Evaluate

Objective: LO 15-6

22) 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 Type: ES

Skill: Understand

Objective: LO 15-6

23) 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: 3 Type: ES

Skill: Understand

Objective: LO 15-6

24) 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 Type: ES

Skill: Understand

Objective: LO 15-6