MIDTERM EXAM
AFM 102: Introduction to Managerial Accounting
Sections 001, 002, 003 and 004
February 29, 2008: 4:30 – 6:00 PM
Instructors: Rob Ducharme; Thomas Vance

STUDENT NAME: ________________________________

STUDENT ID: __________________________________

TUTORIAL:
Room: PAS 1229
   _____ 9:30-10:20 (101)
   _____ 10:30-11:30 (102)
   _____ 11:30-12:20 (103)
   _____ 12:30-1:20 (104)
   _____ 1:30-2:20 (105)
   _____ 2:30-3:20 (106)
   _____ 3:30-4:20 (107)
   _____ 4:30-5:20 (108)

Room: HH 138
   _____ 1:30-2:20 (109)
   _____ 2:30-3:20 (110)
   _____ 3:30-4:20 (111)
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• Non-programmable calculators may be used.
• Show all your work as partial points may be awarded (on questions 2-8).
• Clearly label your solutions to each part of Questions 2-8 to facilitate accurate
  marking.

MARKS (Awarded / Possible)
   Q1: ______ / 31
   Q2: ______ / 8
   Q3: ______ / 6
   Q4: ______ / 14
   Q5: ______ / 8
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   TOT: ______ / 90
Q1. 

ANSWER MULTIPLE CHOICE QUESTIONS ON THE SCANTRON SHEET

One mark per question, unless preceded by ‘**’, then two.

1. Which of the following statements about overhead allocation based on volume alone is correct?
   A) It is a key aspect of the activity-based costing model.
   B) It will systematically overcost high-volume products and undercost low-volume products.
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*9. Sally Smith is employed in the production of various electronic products, and she earns $8 per hour. She is paid time-and-a-half for work in excess of 40 hours per week. During a given week, she worked 45 hours and had no idle time. How much of her week's wages would be charged to manufacturing overhead?  
   A) $60.  
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10. For internal uses, managers are more concerned with receiving information that achieves which of the following standards?  
    A) Completely objective and verifiable.  
    B) Completely accurate and precise.  
    C) Relevant, flexible, and timely.  
    D) Relevant, completely accurate, and precise.

11. Which of the following outcomes is the least affected directly by improvement programs such as JIT, TQM, Process Reengineering, Lean Production, and Six Sigma?  
    A) Increased profits.  
    B) Cost reduction.  
    C) Quality enhancement.  
    D) Improved customer response time.
12. In a job-order costing system, the use of indirect materials would usually be recorded as a debit to which account?
   A) Raw Materials.
   B) Work in Process.
   C) Manufacturing Overhead.
   D) Finished Goods.

13. Which of the following costs/expenses is included in product costs under both absorption costing and variable costing?
   A) Supervisory salaries.
   B) Equipment depreciation.
   C) Variable manufacturing costs.
   D) Variable selling expenses.

14. Which of the following outcomes would a company adopting the JIT approach hope to achieve?
   A) Produce large batches of products so as to recoup the costs associated with set-ups.
   B) Reduce set-up time so as to economically produce in smaller batches.
   C) Adapt a functional plant layout so as to enhance production flexibility.
   D) Require workers to become highly specialized in operating a single machine.

15. What factor is the cause of the difference between operating income computed using absorption costing and operating income computed using variable costing?
   A) Absorption costing considers all manufacturing costs in the determination of operating income, whereas variable costing considers only prime costs.
   B) Absorption costing allocates fixed manufacturing costs between cost of goods sold and inventories, and variable costing considers all fixed manufacturing costs as period costs.
   C) Absorption costing includes all variable manufacturing costs in product costs, but variable costing considers variable manufacturing costs to be period costs.
   D) Absorption costing includes all fixed manufacturing costs in product costs, but variable costing expenses all fixed manufacturing costs.

16. Expense A is a fixed cost; expense B is a variable cost. During the current year, the activity level has increased but is still within the relevant range. In terms of cost per unit of activity, you would expect which of the following statements to be true?
   A) Expense A has remained unchanged.
   B) Expense B has decreased.
   C) Expense A has decreased.
   D) Expense B has increased.

17. If company A has a higher degree of operating leverage than company B, then which of the following statements is true?
   A) Company A has higher variable expenses.
   B) Company A's profits are more sensitive to percentage changes in sales.
   C) Company A is more profitable.
   D) Company A is less risky.
18. What does the term “relevant range” mean?
A) The range within which costs may fluctuate.
B) The range within which a particular cost formula is valid.
C) The range within which production may vary.
D) The range within which the relevant costs are incurred.

19. Which of the following costs is often important in decision making, but is omitted from conventional accounting records?
A) Fixed cost.
B) Sunk cost.
C) Opportunity cost.
D) Indirect cost.

20. For the most recent year, Atlantic Company's operating income computed using the absorption costing method was $7,400, and its operating income computed using the variable costing method was $10,100. The company's unit product cost was $17 under variable costing and $22 under absorption costing. What must have been the beginning inventory if the ending inventory consisted of 1,460 units?
A) 920 units.
B) 1,460 units.
C) 2,000 units.
D) 12,700 units.

21. The following costs were incurred in January:

<table>
<thead>
<tr>
<th>Cost</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>$43,000</td>
</tr>
<tr>
<td>Direct labour</td>
<td>$30,000</td>
</tr>
<tr>
<td>Manufacturing overhead</td>
<td>$25,000</td>
</tr>
<tr>
<td>Selling expenses</td>
<td>$12,000</td>
</tr>
<tr>
<td>Administrative expenses</td>
<td>$28,000</td>
</tr>
</tbody>
</table>

Prime costs during the month totaled:
A) $98,000
B) $73,000
C) $55,000
D) $138,000

22. What is a cost driver?
A) It is the largest single category of cost in a company.
B) It is a fixed cost that cannot be avoided.
C) It is a factor that causes variations in a cost.
D) It is an indirect cost that is essential to the business.
23. Which of the following is not a limitation of activity-based costing?
   A) Maintaining an activity-based costing system is more costly than maintaining a traditional direct labour-based costing system.
   B) Changing from a traditional direct labour-based costing system to an activity-based costing system changes product margins and other key performance indicators used by managers. Such changes are often resisted by managers.
   C) In practice, most managers insist on fully allocating all costs to products, customers, and other costing objects in an activity-based costing system. This results in overstated costs.
   D) More accurate product costs may result in increasing the selling prices of some products.

24. Which of the following aspects of designing a costing system is a higher-level and more subjective activity?
   A) Accumulating costs by departments.
   B) Applying costs to cost objects.
   C) Assessing cost/benefit trade-offs of different systems.
   D) Assigning cost to jobs and/or process.

25. Which of the following would be classified as a product-level activity?
   A) Machine setup for a batch of a standard product.
   B) Cafeteria facilities available to and used by all employees.
   C) Human resource management.
   D) Advertising a product.

26. Which of the following statements is true for a firm that uses variable costing?
   A) The unit product cost changes as a result of changes in the number of units manufactured.
   B) Both variable selling costs and variable production costs are included in the unit product cost.
   C) Operating income moves in the same direction as sales.
   D) Operating income is greatest in periods when production is highest.

*27. Rossiter Company failed to record a credit sale at the end of the year, although the reduction in finished goods inventories was correctly recorded when the goods were shipped to the customer. Which one of the following statements is correct?
   A) Accounts receivable was not affected, inventory was not affected, sales were understated, and cost of goods sold was understated.
   B) Accounts receivable was understated, inventory was overstated, sales were understated, and cost of goods sold was overstated.
   C) Accounts receivable was not affected, inventory was understated, sales were understated, and cost of goods sold was understated.
   D) Accounts receivable was understated, inventory was not affected, sales were understated, and cost of goods sold was not affected.
28. A company increased the selling price for its product from $1.00 to $1.10 a unit when total fixed expenses increased from $400,000 to $480,000 and the variable expense per unit remained unchanged. How would these changes affect the break-even point?
   A) The break-even point in units would increase.
   B) The break-even point in units would decrease.
   C) The break-even point in units would remain unchanged.
   D) The effect cannot be determined from the information given.
Q2. (8 marks) Ayotte is a Vancouver BC-based manufacturer of acoustic drums. Management is planning production for the upcoming year and would like to know what unit product cost will be under both absorption and variable cost approaches. Fixed manufacturing overhead is expected to be $250,000 and the forecast calls for 1,250 drums to be manufactured and 1,000 sold. Each drum is expected to use $75 in raw materials and will require 15 hours of direct labour at $17.00 per hour. Variable overhead per drum is $2.00.

Determine the unit cost per drum under absorption and variable costing methods.
Q3. (6 Marks) Management at Black Happy Productions is conducting a comprehensive investigation of cost behavior related to production of their single product. You have been asked to evaluate the behavior of shipping costs. Activity and costs for the last seven months is listed below.

<table>
<thead>
<tr>
<th>Month</th>
<th>Activity</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aug</td>
<td>1,000</td>
<td>$24,000</td>
</tr>
<tr>
<td>Sep</td>
<td>1,500</td>
<td>$28,000</td>
</tr>
<tr>
<td>Oct</td>
<td>1,240</td>
<td>$26,000</td>
</tr>
<tr>
<td>Nov</td>
<td>1,750</td>
<td>$27,500</td>
</tr>
<tr>
<td>Dec</td>
<td>950</td>
<td>$22,000</td>
</tr>
<tr>
<td>Jan</td>
<td>1,100</td>
<td>$21,000</td>
</tr>
<tr>
<td>Feb</td>
<td>1,450</td>
<td>$25,500</td>
</tr>
</tbody>
</table>

Use the high-low method to provide management with the mixed-cost equation for the shipping activity.
Q4. (14 marks) On December 1, managers at Green River Industries found that 10,000 completed units were sitting in inventory. In an attempt to deal with the problem, the decision was made to scale production back in January and then increase production in the subsequent periods, to be in line with demand. The operating results from the last three months can be seen below.

<table>
<thead>
<tr>
<th></th>
<th>December</th>
<th>January</th>
<th>February</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>$1,875,000</td>
<td>$1,950,000</td>
<td>$2,175,000</td>
</tr>
<tr>
<td>Less COGS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beg. FG Inv.</td>
<td>630,000</td>
<td>126,000</td>
<td>189,000</td>
</tr>
<tr>
<td>COGM</td>
<td>1,071,000</td>
<td>1,701,000</td>
<td>1,764,000</td>
</tr>
<tr>
<td>Less Ending FG Inv.</td>
<td>126,000</td>
<td>189,000</td>
<td>126,000</td>
</tr>
<tr>
<td>COGS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$1,575,000</td>
<td>$1,638,000</td>
<td>$1,827,000</td>
</tr>
<tr>
<td>Under or (over) applied fixed overhead</td>
<td>80,000</td>
<td>(20,000)</td>
<td>(30,000)</td>
</tr>
<tr>
<td>Adjust COGS</td>
<td>1,655,000</td>
<td>1,618,000</td>
<td>1,797,000</td>
</tr>
<tr>
<td>Gross Margin</td>
<td>220,000</td>
<td>332,000</td>
<td>378,000</td>
</tr>
<tr>
<td>Less S&amp;A</td>
<td>150,000</td>
<td>150,000</td>
<td>150,000</td>
</tr>
<tr>
<td>Operating Income</td>
<td>$70,000</td>
<td>$182,000</td>
<td>$228,000</td>
</tr>
</tbody>
</table>

Production (units) | 17,000 | 27,000 | 28,000 |
Sales (Units) | 25,000 | 26,000 | 29,000 |
Sales Price ($) | $75.00 | $75.00 | $75.00 |
Absorption unit cost | $63.00 | $63.00 | $63.00 |
Variable unit cost | $53.00 | $53.00 | $53.00 |

To more fully understand firm performance, management has asked you to provide the following:

a) For February only, provide a complete contribution margin-format income statement and reconcile the two operating income amounts.

b) For December and January, provide only the operating income that would appear on a contribution margin format statement and show your reconciliation of the two operating income amounts. NOTE: you do not have to construct the entire statement to determine the operating income numbers.
Q5. (8 marks) SSSP Inc. installs drywall and other paneling in homes and businesses. The company uses an activity-based costing system for its overhead costs. The company has provided the following data concerning its annual overhead costs and its activity based costing system:

<table>
<thead>
<tr>
<th>Overhead Costs</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production Overhead</td>
<td>$110,000</td>
</tr>
<tr>
<td>Office Expense</td>
<td>$130,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$240,000</strong></td>
</tr>
</tbody>
</table>

### Distribution of resource consumption

<table>
<thead>
<tr>
<th>Activity Cost Pool</th>
<th>Installation</th>
<th>Support</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production Overhead</td>
<td>50%</td>
<td>25%</td>
<td>25%</td>
</tr>
<tr>
<td>Office Expense</td>
<td>5%</td>
<td>65%</td>
<td>30%</td>
</tr>
</tbody>
</table>

The 'Other' activity cost pool consists of idle capacity and organization-sustaining costs.

<table>
<thead>
<tr>
<th>Activity Cost Pool</th>
<th>Annual Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installation</td>
<td>500 squares</td>
</tr>
<tr>
<td>Job Support</td>
<td>80 jobs</td>
</tr>
<tr>
<td>Other</td>
<td>N/A</td>
</tr>
</tbody>
</table>

A “square” is a measure of area that is roughly equivalent to 1,000 square feet.

Management has asked you to complete the following:

a) Prepare the first-stage allocation of overhead costs to the activity cost pools.

b) Calculate the activity cost driver rate for each applicable cost pool.

c) Calculate the overhead cost of a 6 square job.
Q6. (5 marks) Lanegan Corporation uses activity-based costing to compute product costs for external reports. The company has two activity cost pools and applies overhead using predetermined overhead rates for each activity cost pool. Estimated costs and activities for the current year are presented below for the two activity centres:

<table>
<thead>
<tr>
<th>Centre</th>
<th>Est. Overhead</th>
<th>Expected Activity</th>
<th>Rate</th>
<th>Actual Overhead</th>
<th>Actual Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material Handling</td>
<td>$52,800</td>
<td>2,400</td>
<td>$22.00</td>
<td>$55,260</td>
<td>2,480</td>
</tr>
<tr>
<td>General Factory</td>
<td>$78,000</td>
<td>2,600</td>
<td>$30.00</td>
<td>$77,590</td>
<td>2,680</td>
</tr>
</tbody>
</table>

a) What was the total overhead applied to products during the year?

b) What was the amount of any over or underapplied overhead for each centre (be sure to clearly designate each answer as to whether the overhead was overapplied or underapplied)?
Q7. (12 marks) Management at Conners Corp expects operating income of $220,000 for the month of March, based on the following sales mix and variable expenses:

<table>
<thead>
<tr>
<th></th>
<th>L</th>
<th>XL</th>
<th>XXL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>$500,000</td>
<td>$300,000</td>
<td>$900,000</td>
</tr>
<tr>
<td>Variable Expenses</td>
<td>$300,000</td>
<td>$210,000</td>
<td>$720,000</td>
</tr>
<tr>
<td>Contribution Margin</td>
<td>$200,000</td>
<td>$90,000</td>
<td>$180,000</td>
</tr>
</tbody>
</table>

Mr. Conners has asked that you provide the following:

a) The break-even sales dollars for Conners Corp.
b) The margin of safety.
c) The degree of operating leverage.
d) The total sales dollars required to double firm operating income.

NOTE: Carry any calculations out to three decimal places (i.e. 0.000).
Q8. (6 marks) Woods Company has a job-order costing system and applies manufacturing overhead cost to products on the basis of machine hours. For the most recent year, actual manufacturing overhead was $1,687,500 and the following applications were made:

<table>
<thead>
<tr>
<th>Amount</th>
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<tbody>
<tr>
<td>Work in process</td>
</tr>
<tr>
<td>$337,500</td>
</tr>
<tr>
<td>Finished goods</td>
</tr>
<tr>
<td>$253,125</td>
</tr>
<tr>
<td>Cost of Goods Sold</td>
</tr>
<tr>
<td>$759,375</td>
</tr>
</tbody>
</table>

Assume any misapplication has been deemed ‘material’. Provide the necessary journal entries to allocate any under- or overapplied overhead to the appropriate accounts.

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STUDENT NAME:____________________________________
STUDENT ID:________________________________________

TUTORIAL:
Room:  PAS 1229     Room: HH 138

<table>
<thead>
<tr>
<th>Time</th>
<th>Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:30-10:20</td>
<td>101</td>
</tr>
<tr>
<td>10:30-11:30</td>
<td>102</td>
</tr>
<tr>
<td>11:30-12:20</td>
<td>103</td>
</tr>
<tr>
<td>12:30-1:20</td>
<td>104</td>
</tr>
<tr>
<td>1:30-2:20</td>
<td>105</td>
</tr>
<tr>
<td>2:30-3:20</td>
<td>106</td>
</tr>
<tr>
<td>3:30-4:20</td>
<td>107</td>
</tr>
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<td>108</td>
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    B) Completely accurate and precise.
    C) Relevant, flexible, and timely.
    D) Relevant, completely accurate, and precise.

11. Which of the following outcomes is the least affected directly by improvement programs such as JIT, TQM, Process Reengineering, Lean Production, and Six Sigma?
    A) Increased profits.
    B) Cost reduction.
    C) Quality enhancement.
    D) Improved customer response time.
12. In a job-order costing system, the use of indirect materials would usually be recorded as a debit to which account?
   A) Raw Materials.
   B) Work in Process.
   C) **Manufacturing Overhead.**
   D) Finished Goods.

13. Which of the following costs/expenses is included in product costs under both absorption costing and variable costing?
   A) Supervisory salaries.
   B) Equipment depreciation.
   C) **Variable manufacturing costs.**
   D) Variable selling expenses.

14. Which of the following outcomes would a company adopting the JIT approach hope to achieve?
   A) Produce large batches of products so as to recoup the costs associated with set-ups.
   B) **Reduce set-up time so as to economically produce in smaller batches.**
   C) Adapt a functional plant layout so as to enhance production flexibility.
   D) Require workers to become highly specialized in operating a single machine.

15. What factor is the cause of the difference between operating income computed using absorption costing and operating income computed using variable costing?
   A) Absorption costing considers all manufacturing costs in the determination of operating income, whereas variable costing considers only prime costs.
   B) **Absorption costing allocates fixed manufacturing costs between cost of goods sold and inventories, and variable costing considers all fixed manufacturing costs as period costs.**
   C) Absorption costing includes all variable manufacturing costs in product costs, but variable costing considers variable manufacturing costs to be period costs.
   D) Absorption costing includes all fixed manufacturing costs in product costs, but variable costing expenses all fixed manufacturing costs.

16. Expense A is a fixed cost; expense B is a variable cost. During the current year, the activity level has increased but is still within the relevant range. In terms of cost per unit of activity, you would expect which of the following statements to be true?
   A) Expense A has remained unchanged.
   B) Expense B has decreased.
   C) **Expense A has decreased.**
   D) Expense B has increased.

17. If company A has a higher degree of operating leverage than company B, then which of the following statements is true?
   A) Company A has higher variable expenses.
   B) **Company A's profits are more sensitive to percentage changes in sales.**
   C) Company A is more profitable.
   D) Company A is less risky.
18. What does the term “relevant range” mean?
   A) The range within which costs may fluctuate.
   B) The range within which a particular cost formula is valid.
   C) The range within which production may vary.
   D) The range within which the relevant costs are incurred.

19. Which of the following costs is often important in decision making, but is omitted from conventional accounting records?
   A) Fixed cost.
   B) Sunk cost.
   C) **Opportunity cost.**
   D) Indirect cost.

*20. For the most recent year, Atlantic Company's operating income computed using the absorption costing method was $7,400, and its operating income computed using the variable costing method was $10,100. The company's unit product cost was $17 under variable costing and $22 under absorption costing. What must have been the beginning inventory if the ending inventory consisted of 1,460 units?
   A) 920 units.
   B) 1,460 units.
   C) **2,000 units.**
   D) 12,700 units.

21. The following costs were incurred in January:

<table>
<thead>
<tr>
<th>Cost</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>$43,000</td>
</tr>
<tr>
<td>Direct labour</td>
<td>$30,000</td>
</tr>
<tr>
<td>Manufacturing overhead</td>
<td>$25,000</td>
</tr>
<tr>
<td>Selling expenses</td>
<td>$12,000</td>
</tr>
<tr>
<td>Administrative expenses</td>
<td>$28,000</td>
</tr>
</tbody>
</table>

   Prime costs during the month totaled:
   A) $98,000
   B) **$73,000**
   C) $55,000
   D) $138,000

22. What is a cost driver?
   A) It is the largest single category of cost in a company.
   B) It is a fixed cost that cannot be avoided.
   C) **It is a factor that causes variations in a cost.**
   D) It is an indirect cost that is essential to the business.
23. Which of the following is **not** a limitation of activity-based costing?
   A) Maintaining an activity-based costing system is more costly than maintaining a traditional direct labour-based costing system.
   B) Changing from a traditional direct labour-based costing system to an activity-based costing system changes product margins and other key performance indicators used by managers. Such changes are often resisted by managers.
   C) In practice, most managers insist on fully allocating all costs to products, customers, and other costing objects in an activity-based costing system. This results in overstated costs.
   D) **More accurate product costs may result in increasing the selling prices of some products.**

24. Which of the following aspects of designing a costing system is a higher-level and more subjective activity?
   A) Accumulating costs by departments.
   B) Applying costs to cost objects.
   C) **Assessing cost/benefit trade-offs of different systems.**
   D) Assigning cost to jobs and/or process.

25. Which of the following would be classified as a product-level activity?
   A) Machine setup for a batch of a standard product.
   B) Cafeteria facilities available to and used by all employees.
   C) Human resource management.
   D) **Advertising a product.**

26. Which of the following statements is true for a firm that uses variable costing?
   A) The unit product cost changes as a result of changes in the number of units manufactured.
   B) Both variable selling costs and variable production costs are included in the unit product cost.
   C) **Operating income moves in the same direction as sales.**
   D) Operating income is greatest in periods when production is highest.

27. Rossiter Company failed to record a credit sale at the end of the year, although the reduction in finished goods inventories was correctly recorded when the goods were shipped to the customer. Which one of the following statements is correct?
   A) Accounts receivable was not affected, inventory was not affected, sales were understated, and cost of goods sold was understated.
   B) Accounts receivable was understated, inventory was overstated, sales were understated, and cost of goods sold was overstated.
   C) Accounts receivable was not affected, inventory was understated, sales were understated, and cost of goods sold was understated.
   D) **Accounts receivable was understated, inventory was not affected, sales were understated, and cost of goods sold was not affected.**
28. A company increased the selling price for its product from $1.00 to $1.10 a unit when total fixed expenses increased from $400,000 to $480,000 and the variable expense per unit remained unchanged. How would these changes affect the break-even point?
   A) The break-even point in units would increase.
   B) The break-even point in units would decrease.
   C) The break-even point in units would remain unchanged.
   D) The effect cannot be determined from the information given.
Q2. (8 marks) Ayotte is a Vancouver BC-based manufacturer of acoustic drums. Management is planning production for the upcoming year and would like to know what unit product cost will be under both absorption and variable cost approaches. Fixed manufacturing overhead is expected to be $250,000 and the forecast calls for 1,250 drums to be manufactured and 1,000 sold. Each drum is expected to use $75 in raw materials and will require 15 hours of direct labour at $17.00 per hour. Variable overhead per drum is $2.00.

Determine the unit cost per drum under absorption and variable costing methods.

SOLUTION:

<table>
<thead>
<tr>
<th></th>
<th>variable costing</th>
<th>absorption costing</th>
</tr>
</thead>
<tbody>
<tr>
<td>DM</td>
<td>$75</td>
<td>$75</td>
</tr>
<tr>
<td>DL</td>
<td>$255</td>
<td>$255 (= 15hr * $17)</td>
</tr>
<tr>
<td>VMOH</td>
<td>$2</td>
<td>$2</td>
</tr>
<tr>
<td>FMOH</td>
<td>$200</td>
<td>($=250,000/1,250 units produced)</td>
</tr>
<tr>
<td>unit product cost</td>
<td>$332</td>
<td>$532</td>
</tr>
</tbody>
</table>

(1) correct unit cost  (1) correct unit cost
Q3. (6 Marks) Management at Black Happy Productions is conducting a comprehensive investigation of cost behavior related to production of their single product. You have been asked to evaluate the behavior of shipping costs. Activity and costs for the last seven months is listed below.

<table>
<thead>
<tr>
<th>Month</th>
<th>Activity</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aug</td>
<td>1,000</td>
<td>$24,000</td>
</tr>
<tr>
<td>Sep</td>
<td>1,500</td>
<td>$28,000</td>
</tr>
<tr>
<td>Oct</td>
<td>1,240</td>
<td>$26,000</td>
</tr>
<tr>
<td>Nov</td>
<td>1,750</td>
<td>$27,500</td>
</tr>
<tr>
<td>Dec</td>
<td>950</td>
<td>$22,000</td>
</tr>
<tr>
<td>Jan</td>
<td>1,100</td>
<td>$21,000</td>
</tr>
<tr>
<td>Feb</td>
<td>1,450</td>
<td>$25,500</td>
</tr>
</tbody>
</table>

Use the high-low method to provide management with the mixed-cost equation for the shipping activity.

SOLUTION (correctly using high-low activity level):

\[
\begin{array}{ccc}
\text{Units} & \text{Cost} \\
\text{High activity level (Nov)} & 1,750 & $27,500 \\
\text{Low activity level (Dec)} & 950 & $22,000 \\
\text{Change} & 800 & $5,500 \\
\end{array}
\]

variable cost = \( \Delta \text{cost} / \Delta \text{units} = \$5,500 / 800 \text{ units} = \$6.875 \text{ per unit} \)

\[
\text{Total cost at the high level} = \$27,500.00 \\
\text{Less: variable cost element (1,750 units x} \$6.875) = \$12,031.25 \]

\[
\text{Fixed cost element} = \$15,468.75
\]

mixed-cost equation:
\[
y = ax + b \\
y = \$6.875x + \$15,468.75
\]

*****

ALTERNATE SOLUTION (incorrectly using high-low cost level) (max available is 4/6):

\[
\begin{array}{ccc}
\text{Units} & \text{Cost} \\
\text{High activity level (Nov)} & 1,500 & $28,000 \\
\text{Low activity level (Dec)} & 1,100 & $21,000 \\
\text{Change} & 400 & $7,000 \\
\end{array}
\]

variable cost = \( \Delta \text{cost} / \Delta \text{units} = \$7,000 / 400 \text{ units} = \$17.50 \text{ per unit} \)

\[
\text{Total cost at the high level} = \$28,000.00 \\
\text{Less: variable cost element (1,500 units x} \$17.50) = \$26,250.00 \]

\[
\text{Fixed cost element} = \$1,750.00
\]

mixed-cost equation:
\[
y = ax + b \\
y = \$17.50x + \$1,750.00
\]
Q4. (14 marks) On December 1, managers at Green River Industries found that 10,000 completed units were sitting in inventory. In an attempt to deal with the problem, the decision was made to scale production back in January and then increase production in the subsequent periods, to be in line with demand. The operating results from the last three months can be seen below.

<table>
<thead>
<tr>
<th></th>
<th>December</th>
<th>January</th>
<th>February</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>$1,875,000</td>
<td>$1,950,000</td>
<td>$2,175,000</td>
</tr>
<tr>
<td>Less COGS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beg. FG Inv.</td>
<td>630,000</td>
<td>126,000</td>
<td>189,000</td>
</tr>
<tr>
<td>COGM</td>
<td>1,071,000</td>
<td>1,701,000</td>
<td>1,764,000</td>
</tr>
<tr>
<td>Less Ending FG Inv.</td>
<td>126,000</td>
<td>189,000</td>
<td>126,000</td>
</tr>
<tr>
<td>COGS</td>
<td>$1,575,000</td>
<td>$1,638,000</td>
<td>$1,827,000</td>
</tr>
<tr>
<td>Under or (over) applied fixed overhead</td>
<td>80,000</td>
<td>(20,000)</td>
<td>(30,000)</td>
</tr>
<tr>
<td>Adjust COGS</td>
<td>1,655,000</td>
<td>1,618,000</td>
<td>1,797,000</td>
</tr>
<tr>
<td>Gross Margin</td>
<td>220,000</td>
<td>332,000</td>
<td>378,000</td>
</tr>
<tr>
<td>Less S&amp;A</td>
<td>150,000</td>
<td>150,000</td>
<td>150,000</td>
</tr>
<tr>
<td>Operating Income</td>
<td>$70,000</td>
<td>$182,000</td>
<td>$228,000</td>
</tr>
</tbody>
</table>

Production (units) | 17,000 | 27,000 | 28,000 |
Sales (Units)      | 25,000 | 26,000 | 29,000 |
Sales Price ($)    | $75.00 | $75.00 | $75.00 |
Absorption unit cost | $63.00 | $63.00 | $63.00 |
Variable unit cost   | $53.00 | $53.00 | $53.00 |

To more fully understand firm performance, management has asked you to provide the following:

a) For February only, provide a complete contribution margin-format income statement and reconcile the two operating income amounts.

b) For December and January, provide only the operating income that would appear on a contribution margin format statement and show your reconciliation of the two operating income amounts. NOTE: you do not have to construct the entire statement to determine the operating income numbers.
SOLUTION:

<table>
<thead>
<tr>
<th></th>
<th>Dec</th>
<th>Jan</th>
<th>Feb</th>
</tr>
</thead>
<tbody>
<tr>
<td>beginning inventory (units)</td>
<td>10,000</td>
<td>2,000</td>
<td>3,000</td>
</tr>
<tr>
<td>production (units)</td>
<td>17,000</td>
<td>27,000</td>
<td>28,000</td>
</tr>
<tr>
<td>sales (units)</td>
<td>25,000</td>
<td>26,000</td>
<td>29,000</td>
</tr>
<tr>
<td>ending inventory (units)</td>
<td>2,000</td>
<td>3,000</td>
<td>2,000</td>
</tr>
</tbody>
</table>

**February**

Sales 2,175,000

Less VC

<table>
<thead>
<tr>
<th></th>
<th>(2)</th>
<th>(1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable Manuf</td>
<td>1,537,000</td>
<td>$53 \times 29,000</td>
</tr>
<tr>
<td>CM</td>
<td>638,000</td>
<td>(1)</td>
</tr>
</tbody>
</table>

Less Fixed

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(1)</th>
<th>(1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed Manuf*</td>
<td>250,000</td>
<td>$10 \times 28,000$ - $30,000</td>
<td></td>
</tr>
<tr>
<td>Fixed S&amp;A</td>
<td>150,000</td>
<td>(1)</td>
<td></td>
</tr>
</tbody>
</table>

OI 238,000

**RECONCILIATIONS**

<table>
<thead>
<tr>
<th></th>
<th>December</th>
<th>January</th>
<th>February</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absorption OI</td>
<td>$70,000</td>
<td>$182,000</td>
<td>$228,000</td>
</tr>
<tr>
<td>Change in Inventory</td>
<td>8,000</td>
<td>(1,000)</td>
<td>1,000</td>
</tr>
<tr>
<td>Allocated Manuf O'head</td>
<td>$10.00</td>
<td>$10.00</td>
<td>$10.00</td>
</tr>
<tr>
<td>Deferred/(Released) Manuf. O'head</td>
<td>$80,000</td>
<td>($10,000)</td>
<td>$10,000</td>
</tr>
<tr>
<td>Variable OI</td>
<td>$150,000</td>
<td>$172,000</td>
<td>$238,000</td>
</tr>
</tbody>
</table>

OR

|                      | (2) | (2) | (2) |

<table>
<thead>
<tr>
<th></th>
<th>December</th>
<th>January</th>
<th>February</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absorption OI</td>
<td>$70,000</td>
<td>$182,000</td>
<td>$228,000</td>
</tr>
<tr>
<td>Add: FMOH released in BI**</td>
<td>$100,000</td>
<td>$20,000</td>
<td>$30,000</td>
</tr>
<tr>
<td>Less: FMOH deferred in EI***</td>
<td>($20,000)</td>
<td>($30,000)</td>
<td>($20,000)</td>
</tr>
<tr>
<td>Variable OI</td>
<td>$150,000</td>
<td>$172,000</td>
<td>$238,000</td>
</tr>
</tbody>
</table>

* Production of 28,000 yielded a $30,000 overallocation; therefore FMOH = $250,000
** Units in beginning inventory * FMOH rate during period
*** Units in ending inventory * FMOH rate during period
Q5. (8 marks) SSSP Inc. installs drywall and other paneling in homes and businesses. The company uses an activity-based costing system for its overhead costs. The company has provided the following data concerning its annual overhead costs and its activity based costing system:

<table>
<thead>
<tr>
<th>Overhead Costs</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production Overhead</td>
<td>$110,000</td>
</tr>
<tr>
<td>Office Expense</td>
<td>$130,000</td>
</tr>
<tr>
<td>Total</td>
<td>$240,000</td>
</tr>
</tbody>
</table>

Distribution of resource consumption

<table>
<thead>
<tr>
<th>Activity Cost Pool</th>
<th>Installation</th>
<th>Support</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production Overhead</td>
<td>50%</td>
<td>25%</td>
<td>25%</td>
</tr>
<tr>
<td>Office Expense</td>
<td>5%</td>
<td>65%</td>
<td>30%</td>
</tr>
</tbody>
</table>

The 'Other' activity cost pool consists of idle capacity and organization-sustaining costs.

<table>
<thead>
<tr>
<th>Activity Cost Pool</th>
<th>Annual Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installation</td>
<td>500 squares</td>
</tr>
<tr>
<td>Job Support</td>
<td>80 jobs</td>
</tr>
<tr>
<td>Other</td>
<td>N/A</td>
</tr>
</tbody>
</table>

A “square” is a measure of area that is roughly equivalent to 1,000 square feet.

Management has asked you to complete the following:

a) Prepare the first-stage allocation of overhead costs to the activity cost pools.
b) Calculate the activity cost driver rate for each applicable cost pool.
c) Calculate the overhead cost of a 6 square job.
SOLUTION:

(a) and (b)

<table>
<thead>
<tr>
<th>Activity</th>
<th>Installing</th>
<th>Support</th>
<th>Other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production overhead</td>
<td>(.5) $55,000</td>
<td>(.5) $27,500</td>
<td>(.5) $27,500</td>
<td>$110,000</td>
</tr>
<tr>
<td>Office expense</td>
<td>(.5) $6,500</td>
<td>(.5) $84,500</td>
<td>(.5) $39,000</td>
<td>$130,000</td>
</tr>
<tr>
<td>Total</td>
<td>$61,500</td>
<td>$112,000</td>
<td>$66,500</td>
<td>$240,000</td>
</tr>
</tbody>
</table>

Activity level 500 squares 80 jobs

ACDR $123 / square $1,400 / job

or (b) Activity rates (costs divided by activity)

<table>
<thead>
<tr>
<th>Activity</th>
<th>Production overhead</th>
<th>Office expense</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$110.00</td>
<td>$13.00</td>
</tr>
<tr>
<td>Total</td>
<td>$123.00</td>
<td>$1,056.25</td>
</tr>
</tbody>
</table>

(c)

Overhead cost of 6 square job

<table>
<thead>
<tr>
<th>Activity</th>
<th>Installing</th>
<th>Job</th>
</tr>
</thead>
<tbody>
<tr>
<td>Floors</td>
<td>Support</td>
<td>Total</td>
</tr>
<tr>
<td>(6 sq)</td>
<td>(1 job)</td>
<td></td>
</tr>
<tr>
<td>Production overhead</td>
<td>$660.00</td>
<td>$343.75</td>
</tr>
<tr>
<td>Office expense</td>
<td>78.00</td>
<td>1,056.25</td>
</tr>
<tr>
<td>Total</td>
<td>$738.00</td>
<td>$1,400.00</td>
</tr>
</tbody>
</table>

(1) for calculation of ACDRx6 calculation of ACDRx1 (ie. added up install+job and not including anything else)

(deduct 1 point if student attempts to allocate “other” activity cost pool)
Q6. (5 marks) Lanegan Corporation uses activity-based costing to compute product costs for external reports. The company has two activity cost pools and applies overhead using predetermined overhead rates for each activity cost pool. Estimated costs and activities for the current year are presented below for the two activity centres:

<table>
<thead>
<tr>
<th>Centre</th>
<th>Est. Overhead</th>
<th>Expected Activity</th>
<th>Activity Rate</th>
<th>Actual Overhead</th>
<th>Actual Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material Handling</td>
<td>$52,800</td>
<td>2,400</td>
<td>$22.00</td>
<td>$55,260</td>
<td>2,480</td>
</tr>
<tr>
<td>General Factory</td>
<td>$78,000</td>
<td>2,600</td>
<td>$30.00</td>
<td>$77,590</td>
<td>2,680</td>
</tr>
</tbody>
</table>

a) What was the total overhead applied to products during the year?

b) What was the amount of any over or underapplied overhead for each centre (be sure to clearly designate each answer as to whether the overhead was overapplied or underapplied)?

SOLUTION:

<table>
<thead>
<tr>
<th>Centre</th>
<th>Est. Overhead</th>
<th>Expected Activity</th>
<th>Activity Rate</th>
<th>Actual Overhead</th>
<th>Actual Activity</th>
<th>Amount (over)</th>
<th>Over (Under)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material Handling</td>
<td>$52,800</td>
<td>2,400</td>
<td>$22.00</td>
<td>$55,260</td>
<td>2,480</td>
<td>(.5)</td>
<td>(.5)</td>
</tr>
<tr>
<td>General Factory</td>
<td>$78,000</td>
<td>2,600</td>
<td>$30.00</td>
<td>$77,590</td>
<td>2,680</td>
<td>(.5)</td>
<td>(.5)</td>
</tr>
<tr>
<td>TOTAL</td>
<td>$132,800</td>
<td>5,000</td>
<td>$25.00</td>
<td>$132,850</td>
<td>5,160</td>
<td>(.5)</td>
<td>(.5)</td>
</tr>
</tbody>
</table>
Q7. (12 marks) Management at Conners Corp expects operating income of $220,000 for the month of March, based on the following sales mix and variable expenses:

<table>
<thead>
<tr>
<th></th>
<th>L</th>
<th>XL</th>
<th>XXL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>$500,000</td>
<td>$300,000</td>
<td>$900,000</td>
</tr>
<tr>
<td>Variable Expenses</td>
<td>$300,000</td>
<td>$210,000</td>
<td>$720,000</td>
</tr>
<tr>
<td>Contribution Margin</td>
<td>$200,000</td>
<td>$90,000</td>
<td>$180,000</td>
</tr>
</tbody>
</table>

Mr. Conners has asked that you provide the following:

a) The break-even sales dollars for Conners Corp.
b) The margin of safety.
c) The degree of operating leverage.
d) The total sales dollars required to double firm operating income.

NOTE: Carry any calculations out to three decimal places (i.e. 0.000).

DRAFT SOLUTION (12 points per cover page):

(a)

<table>
<thead>
<tr>
<th></th>
<th>L</th>
<th>XL</th>
<th>XXL</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>sales mix</td>
<td></td>
<td></td>
<td></td>
<td>=A+B+C</td>
</tr>
<tr>
<td>sales</td>
<td>5/17</td>
<td>3/17</td>
<td>9/17</td>
<td>(1)</td>
</tr>
<tr>
<td>variable expenses</td>
<td>5/17</td>
<td>3/17</td>
<td>9/17</td>
<td>(2 correct f.c.)</td>
</tr>
<tr>
<td>CM</td>
<td>200,000</td>
<td>90,000</td>
<td>180,000</td>
<td>(1 correct CM ratio)</td>
</tr>
<tr>
<td>fixed costs</td>
<td></td>
<td></td>
<td></td>
<td>calculated</td>
</tr>
<tr>
<td>budgeted operating income for month</td>
<td></td>
<td></td>
<td></td>
<td>$220,000 given</td>
</tr>
</tbody>
</table>

breakeven sales $ = fixed costs / CM ratio = $250,000 / .27647 = $904,257
(1) (1) (2 correct f.c.) (1 correct CM ratio)

(b)

MOS (in sales $) = total budgeted (or actual) sales $ - breakeven sales $ =
= $1,700,000 - $904,257 = $795,743
(1 correct total sales) (1 b/e c/f from part a)

(c)

degree of operating leverage = CM / operating income = $470,000 / $220,000 = 2.13636
(1 c/f CM) (1 correct op income)

(d)

sales $ required for target profit of $440,000 = (fixed costs + target income) / CM ratio
= ($250,000 + $440,000) / .27647
(1 c/f f.c.) (1 correct t.p.) (1 c/f CM ratio)
= $2,495,750
OR

% change in OI = % change in sales x operating leverage
thus % change in sales = 100% / 2.13636 = 46.809% (100% change in OI = double OI)
total sales dollars = % change in sales x current sales = 1.46809 x $1,700,000 = $2,495,753
Q8. (6 marks) Woods Company has a job-order costing system and applies manufacturing overhead cost to products on the basis of machine hours. For the most recent year, actual manufacturing overhead was $1,687,500 and the following applications were made:

<table>
<thead>
<tr>
<th>Amount</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Work in process</td>
<td>$337,500</td>
</tr>
<tr>
<td>Finished goods</td>
<td>$253,125</td>
</tr>
<tr>
<td>Cost of Goods Sold</td>
<td>$759,375</td>
</tr>
</tbody>
</table>

Assume any misapplication has been deemed ‘material’. Provide the necessary journal entries to allocate any under- or overapplied overhead to the appropriate accounts.

NOTE: Carry any calculations out to three decimal places (i.e. 0.000).

SOLUTION:

(a) 
POHR = budgeted overhead $ / budgeted activity level
  = $1,710,000 / 95,000 mh = $18 per mh

<table>
<thead>
<tr>
<th>MOH</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>actual OH costs</td>
<td>$1,687,500</td>
</tr>
<tr>
<td>applied o/h =75000mh@$18</td>
<td>$1,350,000</td>
</tr>
<tr>
<td>underapplied overhead</td>
<td>$337,500</td>
</tr>
</tbody>
</table>

OR

Calculation of over- or under-applied overhead:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>actual overhead costs</td>
<td>$1,687,500</td>
</tr>
<tr>
<td>overhead applied ($337,500 + $253,125 + $759,375)</td>
<td>$1,350,000</td>
</tr>
<tr>
<td>underapplied overhead</td>
<td>$337,500</td>
</tr>
</tbody>
</table>

Allocation of underapplied overhead:

<table>
<thead>
<tr>
<th>applied o/h in ending balance</th>
<th>%</th>
<th>allocation of underapplied overhead</th>
</tr>
</thead>
<tbody>
<tr>
<td>WIP</td>
<td>$337,500</td>
<td>25.00%</td>
</tr>
<tr>
<td>FG</td>
<td>$253,125</td>
<td>18.75%</td>
</tr>
<tr>
<td>COGS</td>
<td>$759,375</td>
<td>56.25%</td>
</tr>
<tr>
<td></td>
<td>$1,350,000</td>
<td>100.00%</td>
</tr>
</tbody>
</table>

Journal entry:

<table>
<thead>
<tr>
<th>DR</th>
<th>CR</th>
<th>a/c name</th>
<th>calculation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Manufacturing Overhead</td>
<td>$337,500.00 (.5)</td>
</tr>
<tr>
<td></td>
<td>Work in Process</td>
<td>$84,375.00 (.5)</td>
<td>(1)</td>
</tr>
<tr>
<td></td>
<td>Finished Goods</td>
<td>$63,281.25 (.5)</td>
<td>(1)</td>
</tr>
<tr>
<td></td>
<td>Cost of Goods Sold</td>
<td>$189,843.75 (.5)</td>
<td>(1)</td>
</tr>
</tbody>
</table>

(note: deduct 2 points if student get journal entry correct, but has debits and credits reversed)