Question 1 (20 marks: 30 minutes)
Questions with an "*" are worth 2 marks, all others are worth 1 mark.

1. *McGraw Company's 2005 flexible budget for manufacturing overhead indicates that fixed overhead should be $60,000 at the denominator level of 4,000 machine hours. In 2005, the actual fixed overhead cost incurred was $66,000. McGraw uses a standard costing system with 1 machine hour allowed per unit of good output. In 2005 the company produced 3,800 units using 3,900 machine hours. The fixed overhead volume variance for 2005 is:
    a. $6,000 unfavourable
    b. $6,000 favourable
    c. $3,000 favourable
    d. $3,000 unfavourable: ($60,000/4,000)(4,000 – 3,800)

2. *Lessing Company used 2.0 square meters of material for each wetsuit they produced in April 2005. Data from the past 36 months indicates average actual usage of 1.8 square meters of material per wetsuit with a standard deviation of .20. How many standard deviations apart is 2.0 square metres from the average usage of 1.8 square metres, and should a variance investigation be conducted?
    a. **1 and no (2-1.8)/.2; since 1 < 2 (cut-off for z-scores), don't investigate**
    b. 1 and yes
    c. .2 and no
    d. .2 and yes

3. Which of the following statements is (are) true?
    i. If a division's net operating income is positive, it's residual income will also be positive.
    ii. Residual income should be used to evaluate profit center managers.
    iii. ROI can be used to compare divisions of different sizes.

    a. i an ii only
    b. **iii only**
    c. i and iii only
    d. i, ii and iii

4. *Vision Inc. reported actual return on investment of 24% and average operating assets of $1,500,000 for the month of September. If the required rate of return is 20%, what was Vision's residual income in September?
    a. $360,000
    b. $300,000
    c. $60,000 ($1,500,000 x .24) – ($1,500,000 x .20)
    d. $0

5. ~~*Last month the welding department of Eager Company started 8,000 units into production. The department had 2,000 units in process at the beginning of the month, which were 60% complete with respect to conversion costs, and 3,000 units in process at the end of the month, which were 30% complete with respect to conversion costs. A total of 7,000 units were completed and transferred to the next department during the month. Using the weighted-average method, the equivalent units of production for conversion costs for the month would be:~~ **Not relevant: Chapter 4**
   ~~a. 7,900~~
   ~~b. 8,500~~
   ~~c. 9,200~~
   ~~d. 9,500~~

6. ~~The cost of warranty repairs is an example of a(n):~~ **Not relevant: Appendix 2A**

   ~~a. Prevention cost~~
   ~~b. Appraisal cost~~
   ~~c. Internal failure cost~~
   ~~d. External failure cost~~

7. *Juniper Company has provided the following data concerning its manufacturing costs and work in process inventories last month:

Raw materials used in production	$270,000
Direct labour	$140,000
Manufacturing overhead	$190,000
Beginning work in process inventory	$50,000
Ending work in process inventory	$80,000

   The cost of goods manufactured for the month was:

   a. $730,000
   b. $630,000
   c. $600,000
   d. $570,000 ($270,000 + $140,000 + $190,000 + $50,000 - $90,000)

8. Which of the following statements about the balanced scorecard is incorrect:

   a. it should be based on the organization's strategy
   b. it typically contains four categories of measures
   c. it is only prepared for the organization as a whole
   d. the measures it contains will vary from company to company

9. Armco, Inc., produces and sells five product lines. Which of the following costs would typically be a traceable fixed cost of a product line?

    a. advertising costs of the product line
    b. the salary of the product line manager
    c. depreciation of facilities used solely for the product line
    d. all of the above

10. Which of the following is not a possible cause of an unfavourable variable overhead spending variance:

    a. Paying higher hourly wages for indirect labour than planned
    b. Paying more for indirect supplies than planned
    c. Using more indirect supplies than planned
    d. Paying more for insurance on factory equipment than planned

11. Which of the following items will not be relevant when deciding whether to keep or drop a product line?

    a. Contribution margin of the product line
    b. Avoidable fixed costs of the product line
    c. Depreciation on equipment used to manufacture the product
    d. All of the above are relevant

12. *Sauna Company has average invested capital of $900,000 and a target ROI of 20%. The company determines its markup percentage based on absorption costing. Manufacturing costs per unit are as follows: direct materials $6, direct labour $8, variable overhead $2, fixed overhead $2. Unit sales are expected to be 40,000 next year. Total selling and administrative costs are expected to be $360,000. Sauna's mark-up percentage should be:

    a. 75% [($900,000 x .2) + $360,000] / (40,000 x $18)
    b. 25%
    c. 50%
    d. 100%

13. *Garrison Ltd. had the following variances related to overhead in 2005: variable overhead spending, $5,000 unfavourable; variable overhead efficiency $3,000 favourable; fixed overhead budget $1,000 favourable; fixed overhead volume $10,000 unfavourable. By how much was overhead in total, under or over applied for 2005?

    a. $19,000 over applied
    b. $19,000 under applied
    c. $11,000 under applied ($5,000 + $10,000 - $3,000 - $1,000)
    d. $11,000 over applied

Question 2 (12 marks: 18 minutes)

Hart Company applies overhead to jobs on the basis of actual machine hours worked. For 2005, the cost analysts developed a cost prediction model for total overhead with the following details:

Y = $1,000,000 + $2x
Where: Y = total overhead and x = machine hours

The analysts also estimated that total machine hours would be 400,000 in 2005. During October 2005 the company worked on just two jobs. Job A required 10,000 machine hours and was still in progress at month-end. Job B also required 10,000 machine hours but was completed during October. Job B resulted in 1,000 units of finished goods, 200 of which were sold before month-end. Actual total overhead incurred in October was $100,000. There were no opening balances in work-in-progress or finished goods on October 1.

Required:

a. Use the cost prediction model and the estimated total machine hours to develop the 2005 pre-determined rate for total overhead. (**2 marks**)

$1,000,000 + $2(400,000) = $1,800,000/400,000 = $4.50 per hour
.5 .5 .5 .5

b. Determine the amount of over or under applied overhead for October 2005. (**3 marks**)

Actual overhead $100,000 **.5**
Applied overhead:
Job A 10,000 x $4.50 $ 45,000
.5 .5
Job B 10,000 x $4.50 $ 45,000 $90,000
.5 .5 $10,000 underapplied **.5**

c. Prepare a journal entry to allocate the amount calculated in part b. above to work-in-progress, finished goods and cost of goods sold. Base your entry on the amount of applied overhead in each of these accounts in October. (**7 marks**)

	Amount	%	Underapplied OH	Allocation
WIP	**.5** $45,000	**.5** .5	$10,000	$5,000 **.5**
Finished goods	**1** $36,000[1]	**.5** .4	$10,000	$4,000 **.5**
Cost of goods sold	**.5** $9,000	**.5** .1	$10,000	$1,000 **.5**

[1] $45,000 x 800/1,000
.5 .5

WIP	$5,000	**.5**
Finished goods	$4,000	**.5**
Cost of goods sold	$1,000	**.5**
OH Control	$10,000	**.5**

Question 3 (9 marks: 14 minutes)

AFM Televisions produces and sells two types of televisions, LCD and Plasma. Data for these products are as follows:

	LCD	Plasma
Sales price per unit	$4,000	$6,000
Variable costs per unit	$3,000	$4,200
Fixed manufacturing Overhead per year	$250,000	$300,000
Fixed selling and administrative costs per year	$20,000	$30,000
Expected unit sales in 2006	7,500	2,500

Required:
Using either the weighted average approach ~~or the bundling approach:~~

a. Determine the number of televisions in total that must be sold to break-even in 2006 assuming the sales mix is as expected. (**5.5 marks**)

Weighted average approach:
LCD[($4,000 - $3,000) x 7,500/10,000] + Plasma[($6,000 - $4,200) x 2,500/10,000] = $1,200
.5 .5 .5 .5 .5 .5

($250,000 + $300,000 +$20,000 + $30,000) / $1,200 = 500
.5 .5 .5 .5 .5

~~Bundling Approach:~~
~~LCD 3 (7,500/2500) x ($4,000 - $3,000) = $3,000~~
~~**.5 .5 .5**~~
~~Plasma 1 (2,500/2,500) x $($6,000 - $4,200) = $1,800~~
~~**.5 .5 .5**~~

~~($250,000 + $300,000 +$20,000 + $30,000)/$4,800 ($3,000 + $1,800)=125 x 4 (3 + 1) = 500~~
~~**.5 .5 .5 .5 .5**~~
~~**Note: the bundling approach is easier to apply when simplifying the mix using the highest common denominator but will work even if students multiply expected sales by the CM.**~~

b. As part of total sales of both products, how many Plasma televisions must AFM sell in 2006 to generate after-tax income of $72,000 if the tax rate is 40%? Assume the sales mix is as expected. (**3.5 marks**)

Note: for either approach, don't again penalize fixed cost or denominator mistakes made in part 1

Weighted average approach ():
[$600,000 + ($72,000/1-.4)]/ $1,200 = 600 x .25 (2,500/10,000) = 150
.5 .5 1 .5 1

~~Bundling approach~~
~~[$600,000 + ($72,000/1 -.4)]/ $4,800 = 150 x 1 = 150~~
~~**.5 .5 1 .5 1 (whatever value was used in calculating the contribution per bundle should be used again here)**~~

Question 4 (19 marks: 28 minutes)

Part A (7 marks)

Briefly explain the difference between a transaction driver and a duration driver and give an example of each. (**4 marks**)

1 mark for correct definition and 1 mark for an appropriate example.

- **A transaction driver is based on the number of times an activity is performed. Examples could include: number of machine set-ups, number of product inspections, number of purchase orders processed, etc.**
- **A duration driver is based on the time it takes to perform the activity. Examples could include: time required to set-up machines, time taken to inspect products, time required to process purchase orders, etc.**

List one advantage and two disadvantages of allowing employees the opportunity to participate in setting their own budgets. (**3 marks**)

1 mark each:

Advantages:
- **Can result in a more accurate budget**
- **May lead to more highly motivated employees**
- **May lead to more committed employees**

Disadvantages:
- **It can be time consuming**
- **Can lead to budget slack (cheating on budget, intentional understatement of ability)**

Part B (12 marks)
Analysts at Spring Break Ltd. have gathered the following data:

Budgeted direct labour mix at standard rate, for actual output achieved:

Skilled labour	7,650 hours at $32 per hour
Unskilled labour	2,550 hours at $24 per hour

Actual results:

Skilled labour	8,000 hours at $38 per hour
Unskilled labour	2,000 hours at $18 per hour

Required:

1. Calculate the mix and yield variances for direct labour. (**8 marks**)

   Mix

   Give a total of .5 marks for using actual quantity and .5 marks for using budgeted CM/unit for skilled & unskilled combined: total 1 mark

   Skilled (8,000 – 7,500[1]) x $32 = $16,000 unfavourable
   1 **.5**
   Unskilled (2,000 – 2,500[2]) x $24 = $12,000 favourable
   1 **.5**
   $ 4,000 unfavourable

   [1]10,000 x (7,650/10,200)
   .5 **.5**
   [2]10,000 x (2,550/10,200)
   .5 **.5**

   Yield

   Note: the first amount within the brackets should have been carried forward from the mix variance calculations so only award the .5 marks if they use the same amount (even if it's wrong).

   Skilled (7,500 – 7,650) x $32 = $4,800 favourable
   .5 **.5** **.5** **.5**
   Unskilled (2,500 – 2,550) x $24 = $1,200 favourable
   .5 **.5** **.5** **.5**
   $ 6,000 favourable

2. Based on the your analysis in part 1 above, briefly discuss whether the decision to use an actual labour mix that differed from the budget had any impact on the yield variance. Briefly discuss whether the decision to change the labour mix was good for the company overall. (**4 marks**)

   It appears that using more of the skilled labour has resulted in a favourable yield variance since fewer total labour hours were required to achieve the output. 1 mark for recognizing the increase in the use of skilled labour, 1 mark for recognizing the impact on overall labour hours needed.

   The decision was good for the company overall because the net variance was favourable: $4,000 u + $6,000 f = $2,000 f. 1 mark for recognizing the impact on the company (based on their calculations from part 1) and 1 mark for proper justification of their conclusion.

Question 5 (23 marks: 35 minutes)
Part A (17 marks)

Folk Company's Audio Division (AD) produces a speaker used by manufacturers of various audio products. Sales and cost data on the speaker are as follows:

Selling price per unit to external customers	$60
Variable manufacturing costs per unit	$40
Fixed overhead per unit (based on capacity)	$ 2
Variable selling costs per unit	$ 2
Fixed selling and administrative costs per unit	$ 8
Total capacity	25,000 units

The Home Theatre Division (HTD) of Folk Company could use this speaker in one of its products. They require 5,000 speakers per year and are currently paying $57 per speaker from an external supplier. Selling costs are not incurred on internal transfers.

Required:

1. Assuming the AD is currently selling 20,000 speakers per year to external customers, what would be the overall effect on company profits if they were to sell 5,000 speakers per year to the HTD? (**4 marks**)

   ($57 - $40) x 5,000 = $85,000 increase in profits.
   1 1 1 1

2. At what transfer price would the overall gain or loss to the company calculated in part 1 above, be equally shared by the two divisions? (**3 marks**)

   ($57 + $40)/2 = $48.50 per unit; or [($57 - $40)/2] + $40 = $48.50
   1 1 1

Note: there are several ways of getting the $48.50 per unit. Award full marks for any approach that yields the correct answer. Also, do not penalize students in part 2 for using one or more incorrect amounts in part 1.

3. Assume now that the AD is currently selling 23,000 speakers per year to external customers. What is the minimum transfer price they should charge to the HTD for the 5,000 speakers? What would be the overall effect on company profits if the AD were to sell 5,000 speakers per year to the HTD? (**5 marks**)

   ($57 - $50.80[1]) x 5,000 = $31,000 increase to profits.
   .5 3.5 .5 .5

   [1]$40 + [(3,000[2] x $18[3])/5,000]
   .5 1.5 1 .5
   [2](23,000 + 5,000 – 25,000)
   .5 .5 .5
   [3]$60 – ($40 + $2)
   .5 .5

Assume now that the AD is currently selling 25,000 speakers per year to external customers. Further assume that the HTD will use the speaker in a product with the following details:

Selling price per unit	$400
Direct material costs per unit	$300 (excluding the cost of the speaker from the AD)
Direct labour costs per unit	$ 20
Variable overhead costs per unit	$ 10
Fixed overhead costs per unit	$ 8
Variable selling costs per unit	$ 2

Also assume that the HTD can only manufacture and sell this product if they are able to buy the speaker from the AD (i.e., there is no external supplier). What would be the overall effect on company profits if the AD sells 5,000 speakers per year to the HTD? (**5 marks**)

Contribution margin earned selling speakers as part of HTD product:
$400 – ($300 + $20 + $10 + $2 + $40 (cost of making speaker in AD)) = $28
.5 .5 .5 .5 .5 1
Contribution margin earned selling speakers direct from AD:
$60 – ($40 + $2) = $18
.5
Advantage selling as part of HTD product $10
.5 X 5,000
.5 Profits increase by $50,000

Note: students may have calculated the total profits earned by selling the speakers as part of HTD (i.e., $28 x 5,000) and compared that to total profits earned by selling direct from AD ($18 x 5,000) and compared the difference. Award full marks for that approach.

Deduct .5 marks in each of AD and HTD for each fixed cost item included in their analysis.

Part B (**6 marks**)

List a total of three advantages and/or disadvantages of allowing managers to set transfer prices through negotiation. Any combination totaling three advantages and/or disadvantages is acceptable, just clearly identify which is which. (**3 marks**)

1 mark for each correct item (max 3)
Advantages:

- **Preserves the autonomy (independence of managers)**
- **Managers have the best information about costs, market opportunities etc.**

Disadvantages:

- **Time consuming**
- **May favour manager who is the better negotiator**
- **Can be de-motivating for manager who loses the negotiation**
- **May not result in a transfer price that leads to the correct decision**

Briefly describe any relationship that you believe exists between the sales price variance and the market share variance. (**3 marks**)

There is likely to be an inverse relation between the sales price variance and the market share variance: if the sales price variance is favourable, higher prices than planned were charged. This may lead to an unfavourable market share variance as the company may lose market share if they sold at a price that was higher than their competitors.

1 mark for correctly identifying the nature of the relationship (i.e., inverse): either by directly stating it or if it can be inferred from their reasoning; 2 marks for correctly explaining the nature of the relationship.

Question 6 (17 marks: 25 minutes)

Part A (10 marks)
Gulf Shore Company manufactures the carburetors used in the engines it produces. Manufacturing costs for the carburetors are as follows:

	Per Unit	15,000 units per year
Direct materials	$14	$210,000
Direct labour	$10	$150,000
Variable overhead	$3	$45,000
Fixed overhead*	$15	$225,000
	$42	$630,000

*One-third relates to a supervisor's salary who will be laid off if the company stops producing the carburetors. The remaining two-thirds relates to depreciation of special equipment with no resale value.

An outside supplier has offered to sell the 15,000 carburetors per year to the Gulf Shore Company for $35 per unit.

Required:

1. Assuming the Gulf Shore Company has no alternative use for the facilities being used to produce the carburetors, should they accept the offer of $35 per unit? (**4 marks**)

   Incremental costs of making the carburetors:

Direct materials	$14	**.5**
Direct labour	10	**.5**
Variable OH	3	**.5**
Fixed OH	5 ($15 x 1/3)	
Total	$32	**.5 .5**

   Total cost of buying $35 **.5**
   Continue to make since $32 < $35 **1**
   Note: students could have calculated the total incremental costs of making ($32 x 15,000) and compared that to the costs of buying ($35 x 15,000) but this wasn't necessary. Award full marks if they used this approach.

2. Now assume that the facilities used to produce the carburetor could be used to manufacture a product that could generate a total contribution margin of $150,000 per year. Should the company accept the offer of $35 per unit? (**3 marks**)

   There are a number of ways students could have set up this analysis.

   Approach 1:

   Net disadvantage of buying from external supplier from part 1: $3 x 15,000 = ($45,000) **1**
   Contribution margin available by using facilities for another product: $150,000 **1**
   Net increase in profits (**1**) by buying from outside: $105,000

   Approach 2:

   Incremental costs of making carburetors: $32 x 15,000 = $480,000 **.5**
   Opportunity cost of making carburetors $150,000 **1**
   Total $630,000
   Cost of buying carburetors $35 x 15,000 = $525,000 **.5**
   Net increase in profits (**1**) by buying from outside $105,000

   Note: Regardless of the approach, deduct .5 marks for each fixed cost item included in the student's estimate of making or buying the carburetors.

3. List three qualitative factors companies should consider when deciding whether to make a component or buy it from an outside supplier. (**3 marks**)

   1 mark for any reasonable factor including but not limited to:
   - **Quality of product provided by supplier**
   - **Timeliness of delivery**
   - **Reliability of supplier**
   - **Long-term viability of supplier**

Part B (7 marks)

Tanner Computing, a retailing company, has two departments, Hardware and Software. Results from the most recent month of operations are as follows:

	Total	Hardware	Software
Sales	$4,000,000	$3,000,000	$1,000,000
Variable expenses	1,300,000	900,000	400,000
Contribution margin	2,700,000	2,100,000	600,000
Fixed expenses	2,200,000	1,400,000	800,000
Operating income (loss)	$500,000	$700,000	$(200,000)

Analysis shows that 40% of the fixed costs in the Software department are common costs that will continue even if the department is dropped. Of the remaining fixed costs, $50,000 relates to the Software department manager, who if the department is dropped, will be assigned other duties in Tanner Computing at her existing salary. If the Software department is dropped, sales in the Hardware department will drop by 10% with no change to Hardware's fixed costs.

Required:

If the Software department is dropped, what will be the effect on operating income for the company as a whole? Should the department be dropped?

Incremental approach:

Contribution margin lost if software is dropped	($600,000) **1**
Fixed costs avoided: ($800,000 x .6) - $50,000	$430,000
1 1 1	
Lost contribution margin on hardware department	
$2,100,000 x .1	($210,000)
1 1	
Profit decrease (**1**) if dropped	($380,000)

Note: award 1 mark if student if student only included the impact of lost revenues (.1 x $3,000,000) but did not incorporate the reduced variable costs. Similarly, award 1 mark if the student calculated the impact as $700,000 x .1 (net income reduction).

Comparative approach:

	Keep Software	Drop Software	Difference	
Sales	$1,000,000	$0	($1,000,000)	**.5**
Variable expenses	400,000	0	400,000	**.5**
Contribution margin	600,000	0	(600,000)	
Fixed expenses	800,000	370,000[1]	430,000	**3**
Operating income (loss)	$(200,000)	$(370,000)	$(170,000)	

[1]($800,000 x .4) + $50,000
1 **1** **1**

Effects on software	($170,000)	
Lost CM from hardware $2,100,000 x .1	($210,000)	**2**
Profit decrease (**1**) if dropped	($380,000)	

Formula Sheet

Chapter 10

Materials Price Variance = AQ(AP – SP)
Materials Quantity Variance = SP(AQ – SQ)

AQ = actual quantity purchased (price) or used (quantity); AP = actual price; SQ = standard quantity; SP = standard price

Labour rate variance = AH(AR – SR)
Labour efficiency variance = SR(AH – SH)
Variable overhead spending variance = AH(AR – SR)
Variable overhead efficiency variance = SR(AH – SH)

AH = actual hours; AR = actual rate; SR = standard rate; SH = standard hours

Mix Variance = $(AQ_a – M_a)SP_a$
Yield Variance = $(M_a – SQ_a)SP_a$

AQ_a = actual quantity used for input A; M_A = actual total input quantity x budgeted mix_a
SQ_A = standard quantity of input A for output achieved; SP_a = standard price of input A

z-score for statistical approach to variance investigation: z = (x – u) / standard deviation
where: x = actual observation in current period; u = average observations over a period of time

Chapter 11

Fixed overhead budget variance = Actual cost – Flexible budget cost
Fixed overhead volume variance = Fixed portion of predetermined rate x (Denominator hours – standard hours allowed)

Chapter 12 Variances

Sales price variance = (Actual sales price – Budgeted sales price) x Actual sales volume

Market volume variance = (actual market volume – budget market volume) x Anticipated market share % x Budgeted contribution margin per unit

Market share variance = (actual sales quantity – [actual market volume x anticipated market share %]) x Budgeted contribution margin per unit

Sales mix variance = (actual sales quantity- [actual sales quantity at anticipated sales mix]) x Budgeted contribution margin per unit

Sales quantity variance = ([Actual sales quantity at anticipated sales mix] – Anticipated sales quantity) x Budgeted contribution margin per unit

Sales volume variance = (Actual sales quantity – budgeted sales quantity) x Budgeted contribution margin per unit