BUSI 2002 – Intermediate Accounting II
Chapter 17 – Earnings Per Share
Additional Problems with Solutions

Problem 1 Podcast

The December 31, 20x2 Statement of Financial Position of Davis Company included the following items:

- 4,000 9% convertible bonds outstanding. The 20-year bonds mature December 31, 20x5. Each $1,000 bond is convertible into 30 common shares.
- 270,000 convertible, cumulative, preferred shares. These preferred shares have an annual dividend of $2.00 per share and each preferred share can be exchanged for 3 common shares.
- 1,500,000 common shares issued and outstanding.
- 125,000 Series 1 share options outstanding with an exercise price of $45.
- 100,000 Series 2 share options outstanding with an exercise price of $60.

During 20x2, the following occurred:

- Net income was $4,000,000.
- On June 1, 20x2, Davis issued 150,000 new common shares for cash
- The dividends on the preferred shares were paid on June 30, 20x2.
- A $0.25 per share dividend was paid to common shareholders (date of record was April 15) on April 30, 20x2.
- The tax rate for the year was 40%.
- The market value of the common shares averaged $50 for the year.

Required -

a) Compute basic and diluted earnings per common share for 20x2. Show your calculations.

b) Assume that on Nov 31, 20x2, Davis issued a 10% stock dividend to common shareholders. Calculate the weighted average number of common shares for purposes of calculation of basic earnings per share.

Problem 2

The following data is available for the Culum Company for it's 20x4 fiscal year.

- Net income for the year ended December 31, 20x4 amounted to $1,650,000.
- the Culum company had 1,500,000 common shares outstanding at January 1, 20x4.
- The following share issues took place:

March 31	100,000 shares @ $15.67 per share
November 1	200,000 shares @ $17.60 per share

- On May 18, the company declared a 10% stock dividend.
- the Company has $1,000,000 of convertible, cumulative preferred shares outstanding. These shares pay a dividend of 6%. The last time a preferred share dividend was paid was on December 31, 20x1. Each $1,000 par value preferred share converts into 120 common shares
- the company also has $3,000,000 of convertible bonds outstanding. These bonds were issued at par when the market interest rates were 7%. The bonds pay interest semi-annually. Each $1,000 bond is convertible into 50 common shares.
- there are 60,000 stock options outstanding that expire on July 16, 20x8. The holder of the stock options can purchase a share of stock for $7.50.
- the average market price of the shares for 20x4 was $16.00.
- the tax rate is 40%.

Required –

Compute the basic and diluted earnings per share.

Problem 3

Jamie McLeod, controller at Munroe Pharmaceutical Industries, a public company, is currently preparing the calculation for basic and diluted earnings per share and the related disclosure for Munroe's external financial statements. Below is selected financial information for the fiscal year ended June 30, 20x2.

MUNROE PHARMACEUTICAL INDUSTRIES
Selected Statement of Financial Position Information
June 30, 20x2

Long-term debt	
Notes payable, 10%	$ 1,000,000
8%, $5,000,000, semi-annual convertible bonds payable	4,458,112
10% bonds payable	6,000,000
Shareholders' equity	
Preferred Shares, no par, $4.25 cumulative, 100,000 shares authorized, 25,000 shares issued and outstanding	$ 1,250,000
Common Shares, unlimited number of shares authorized, 1,000,000 shares issued and outstanding	4,500,000
Contributed Surplus	500,000
Retained earnings	6,000,000

The following transactions have also occurred at Munroe.

1. Options were granted in 20x0 to purchase 100,000 shares at $15 per share. Although no options were exercised during 20x2, the average price per common share during fiscal year 20x2 was $20 per share.
2. The 8% convertible bonds are convertible into common shares at 50 shares per $1,000 bond. They are exercisable at any time and were issued on July 2, 20x0 when the market interest rate was 10%. The bonds mature on July 2, 20x10.
3. The $4.25 preferred shares was issued in 20x0.
4. There are no preferred dividends in arrears; however, preferred dividends were not declared in fiscal year 20x2.
5. On October 1, 20x1, Munroe issued 200,000 common shares.
6. Net income for fiscal year 20x2 was $1.5 million, and the average income tax rate is 40%.

Required –

For the fiscal year ended June 30, 20x2, calculate Monroe Pharmaceutical Industries':
(a) basic earnings per share
(b) diluted earnings per share

Problem 4

Marion Tess, controller, at Norris Pharmaceutical Industries, a public company, is currently preparing the calculation for basic and fully diluted earnings per share and the related disclosure for Norris' external financial statements. Below is selected financial information for the fiscal year ended June 30, 20x2.

Norris Pharmaceutical Industries
Selected Statement of
Financial Position Information
June 30, 20x2

Long-term debt	
Notes payable, 10%	$ 1,000,000
7% convertible bonds payable	5,000,000
10% bonds payable	6,000,000
Total long-term debt	$12,000,000
Shareholders' equity	
Preferred stock, 8.5% cumulative, $50 par value, 100,000 shares authorized, 25,000 shares issued and outstanding	$ 1,250,000
Common stock, $1 par, 10,000,000 shares authorized. 1,000,000 shares issued and outstanding	1,000,000
Additional paid-in capital	4,000,000
Retained earnings	6,000,000
Total shareholders' equity	$12,250,000

The following transactions have also occurred at Norris.

- Options were granted in 20x0 to purchase 100,000 shares at $15 per share. Although no options were exercised during 20x2, the average price per common share during fiscal year 20x2 was $20 per share, while the market price on June 30, 20x2, was $25 per common share.

- Each bond was issued at face value. The 7% convertible debenture will convert into common stock at 50 shares per $1,000 bond. They are exercisable after five years.

- The 8.5% preferred stock was issued in 20x0.

- There are no preferred dividends in arrears; however, preferred dividends were not declared in fiscal year 20x2.

- The 1,000,000 shares of common stock were outstanding for the entire 20x2 fiscal year.

- Net income for fiscal year 20x2 was $1,500,000, and the average income tax rate is 40%.

Required -

a. For the fiscal year ended June 30, 20x2, calculate Norris Pharmaceutical Industries'
   1. basic earnings per share.
   2. diluted earnings per share.

b. Describe the appropriate disclosure required for earnings per share for Norris Pharmaceutical Industries for the fiscal year ended June 30, 20x2.

Problem 5 Podcast

Rivera Ltd. reported net income of $13,500,000 for the year ended December 31, 20x5. The following information is available:

- there were 3,000,000 common shares outstanding at December 31, 20x5

- the company has a convertible bond issue outstanding with the following characteristics:

Face Value	$10,000,000
Coupon Rate	5.6%
Yield to maturity on date of issue	4.8%
Interest payment dates	June 30 and Dec 31
Bonds mature on	June 30, 20x12

  Bond conversion ratio – each $1,000 bond is convertible into 40 common shares.

- the company has a convertible, cumulative preferred share issue of $25,000,000 paying a dividend of 5%. There are 100,000 shares outstanding. The conversion ratio is 2 common shares for each preferred share. As at December 31, 20x5, the preferred dividends are in arrears 3 years.

- also outstanding are 200,000 noncumulative preferred shares in the amount of $10,000,000. The stated dividend on these preferred shares is 7%. The dividends on these shares were declared in 20x5.

- the following common share transactions took place during the year:

April 1 – Issue	200,000 shares
June 1 – 2:1 split	
October 1 – Shares retired and cancelled	50,000 shares

- the company has two series of stock options outstanding:
  - Series G: 200,000 options, exercise price $12
  - Series H: 150,000 options, exercise price $22

- the average market price of the company's stock in 20x5 was $18

- the tax rate is 40%

- all convertible share conversion ratios are adjusted in the case of a stock split or stock dividend.

Required –

Calculate all relevant EPS numbers for the year ended December 31, 20x5.

Problem 6

On June 1, 20x6, Mowbray Corp. and Surrey Limited merged to form Lancaster Inc. A total of 800,000 shares were issued to complete the merger. The new corporation uses the calendar year as its fiscal year.

On April 1, 20x8, the company issued an additional 400,000 shares for cash. All 1.2 million shares were outstanding on December 31, 20x8. Lancaster Inc. also issued $600,000 of 20-year, 8% convertible bonds at par on July 1, 20x8. Each $1,000 bond converts to 40 shares of common at any interest date. None of the bonds have been convened to date. If the bonds had been issued without the conversion feature, the annual interest rate would have been 10%.

Lancaster Inc. is preparing its annual report for the fiscal year ending December 31, 20x8. The annual report will show earnings per share figures based on a reported after-tax net income of $1,540,000 (the tax rate is 40%).

Required -

Calculate:
1. Basic earnings per share.
2. Diluted earnings per share.

Problem 7

The following information is for Prancer Limited for 20x8:

Net income for the year	$2,200,000
8% convertible bonds issued at par ($1,000 per bond), with each bond convertible into 30 common shares	1,000,000
6% convertible, cumulative preferred shares, $100 par value, with each share convertible into 3 common shares	3,000,000
Common shares (600,000 shares outstanding)	6,000,000
Stock options (granted in a prior year) to purchase 50,000 common shares at $20 per share	500,000
Tax rate for 20x8	42%
Average market price of common shares	$27 per share

There were no changes during 20x8 in the number of common shares, preferred shares, or convertible bonds outstanding. For simplicity, ignore the requirement to book the convertible bonds' equity portion separately.

Required -

(a) Calculate basic earnings per share for 2008.
(b) Calculate diluted earnings per share for 2008.

SOLUTIONS

Problem 1

a) Weighted Average # of Common Shares –

Common Shares outstanding at beginning of year	
1,500,000 – 150,000	1,350,000
June 1 Issue: 150,000 x 7/12	87,500
	1,437,500

Basic EPS = ($4,000,000 – 540,000) / 1,437,500 = $2.41

Effect of Dilution:

Convertible bonds:
Increase in numerator: $4,000,000 x 9% x .6 = $216,000
Increase in denominator: 4,000 x 30 = 120,000
Incremental impact = $216,000 / 120,000 = $1.80

Preferred Shares: $540,000 / 810,000 = $0.67

Series 1 share options:
Free shares = 125,000 - 125,000 x $45 / 50 = 125,000 – 112,500 = 12,500

Series 2 share options are out of the money and therefore antidilutive.

	Numerator	*Denominator*	*EPS*
Basic EPS	$3,460,000	1,437,500	$2.41
Series 1 share options		12,500	
	$3,460,000	1,450,000	2.39
Preferred shares	540,000	810,000	
Diluted EPS	$4,000,000	2,260,000	$1.77

Convertible bonds are not included since they would have an antidilutive effect.

b)

Common Shares outstanding at beginning of year	
(1,500,000 / 1.1) – 150,000	1,213,636
June 1 Issue: 150,000 x 7/12	87,500
Nov 31 Stock Dividend: 1,213,636 x 10%	121,364
87,500 x 10%	8,750
	1,431,250

Problem 2

Basic EPS Calculations -

Weighted average number of common shares -	
Shares outstanding at beginning of year	1,500,000
March 31 issue: 100,000 x 9/12	75,000
May 18 stock dividend – 1,575,000 x 10%	157,500
November 1 issue: 200,000 x 2/12	33,333
	1,765,833

Basic EPS = (1,650,000 – 60,000) / 1,765,833
= 1,590,000 / 1,765,833 = 0.90

Diluted EPS Calculations -

Impact of preferred shares: 60,000 / (1,000,000 / 1,000 x 120 x 1.1)
= 60,000 / 132,000 = $0.45

Impact of convertible bonds:
= ($3,000,000 x 7% x .6) / (3,000,000 / 1,000 x 50 x 1.1)
= $126,000 / 165,000
= $0.76

Impact of options: [60,000 – (60,000 x $7.50 / 16)] x 1.1
= (60,000 – 28,125) x 1.1
= 35,063

Order of entry: options, preferred shares, bonds

	Numerator	*Denominator*	*EPS*
Basic EPS	$1,590,000	1,765,833	$0.90
Options		35,063	
	1,590,000	1,800,896	0.88
Preferred shares	60,000	132,000	
	1,650,000	1,932,896	0.85
Convertible bonds	126,000	165,000	
Diluted EPS	$1,776,000	2,097,896	$0.85

Problem 3

(a) Weighted average number of common shares -

Number of common shares – beginning of year	800,000
Oct 1, 20x1: 200,000 x 9/12	150,000
	950,000

Preferred share dividend = 25,000 shares x $4.25 = 106,250

Basic EPS = ($1,500,0000 – 106,250) / 950,000 = $1.47

(b) Book value of convertible bonds as at July 1, 20x1:
N = 18, I = 5, PMT = 200000, FV = 5,000,000
Solve for PV = $4,415,521

Interest expense on convertible bonds for the year ended June 30, 20x2:

1st half: $4,415,521 x 5%	$220,776
2nd half: ($4,415,521 + 20,776 Amortization of Discount) x 5%	221,815

Impact of convertible bonds:
Numerator = ($220,776 + 221,815) x 0.6 = $265,554
Denominator = $5,000,000 / 1,000 x 50 = 250,000
$265,554 / 250,000 = $1.06

Impact of options:
Free shares = 100,000 - (100,000 x 15 / 20) = 25,000

Order of entry: Options, Bonds

	Numerator	*Denominator*	*EPS*
Basic	$1,393,750	950,000	$1.47
Options		25,000	
	1,393,750	975,000	$1.43
Bonds	265,554	250,000	
	$1,659,304	1,225,000	$1.35

Problem 4

a. Basic EPS = $1,500,000 - 106,250[1] / 1,000,000
= $1,393,750 / 1,000,000
= $1.39

[1] 25,000 shares x $50 x 8.5%

Fully Diluted EPS:

Incremental impact of the exercise of options:

Number of shares assumed purchased:
100,000 x $15 = $1,500,000 / $20 = 75,000
Increase in shares (free shares): 100,000 – 75,000 = 25,000

Incremental impact of the exercise of bonds:

Increase in income = $5,000,000 x 7% x .6 = $210,000
Increase in shares = $5,000,000/1,000 x 50 = 250,000
Incremental impact = $0.84

	Numerator	Denominator	EPS
Basic EPS	$1,393,750	1,000,000	$1.39
Options		25,000	
	$1,393,750	1,025,000	$1.36
Convertible Bonds	210,000	250,000	
	1,603,750	1,275,000	$1.26

b. Norris Pharmaceutical Industries should disclose both basic earnings per share and fully diluted earnings per share on the face of the income Statement for all periods presented.

Problem 5

Basic EPS Calculations

Weighted Average Number of Shares –

# of shares outstanding at beginning of year:
[(3,000,000 + 50,000) / 2] – 200,000 = 1,325,000

Shares outstanding at beginning of year	1,325,000
Apr 1 issue: 200,000 x 9/12	150,000
Jun 1 Stock Split: 1,325,000 + (200,000 x 9/12)	1,475,000
Oct 1 retirement: 50,000 shares x 3/12	(12,500)
Weighted average number of common shares	2,937,500

Preferred Dividends	
Cumulative preferred shares: $25,000,000 x 5%	$1,250,000
Declared dividends on non-cumulative preferred shares: $10,000,000 x 7%	700,000
	$1,950,000

Basic EPS = ($13,500,000 – 1,950,000) / 2,937,500
= $11,550,000 / 2,937,500
= $3.93

Diluted EPS

Incremental impact of convertible bonds:

Book value of bonds, Jan 1, 20x5:
N = 15, I = 2.4, PMT = 280,000, FV = 10,000,000, Solve for PV = $10,498,918

Book value of bonds, December 31 20x5:
N = 13, I = 2.4, PMT = 280,000, FV = 10,000,000, Solve for PV = $10,442,193

Amortization of premium, 20x5: $10,498,918 – 10,442,193 = 56,725

Interest expense = ($280,000 x 2) – 56,725 = $503,275

Incremental impact = ($503,275 x 0.6) / (10,000,000/1,000 x 40 x 2)
= 301,965 / 800,000
= 0.38

Incremental impact of preferred shares:

$1,250,000 / (100,000 x 2 x 2)
= $1,250,000 / 400,000
= $3.125

Impact of Options

Series G options: 200,000 – (200,000 x 12 / 18) = 66,667 x 2 = 133,334

Series H options are out of the money and therefore antidilutive.

Calculation of Diluted EPS –

	Numerator	*Denominator*	*EPS*
Basic EPS	$11,550,000	2,937,500	$3.93
Options		133,334	
	11,550,000	3,070,834	$3.76
Bonds	301,965	800,000	
	$11,851,965	3,870,834	$3.06

Preferred shares are excluded because they are antidilutive.

Diluted EPS = $3.06

Problem 6

1. Weighted average # of common shares = 800,000 + 400,000 (9/12) = 1,100,000

   Basic EPS =$1,540,000 / 1,100,000 = $1.40

2. Incremental impact of bonds =
   Increase in numerator = ($24,852* x 0.60) = $14,911
   Increase in denominator = $600,000 / 1,000 x 40 = 24,000 x ½ = 12,000
   $14,911 / 12,000 = $1.24 => Dilutive

   * Interest expense:
   N = 40, I = 5, PMT = 24,000, FV = 600,000
   Solve for PV = $497,045
   Interest expense = $497,045 x 5% = $24,852

   Diluted EPS = ($1,540,000 + 14,911) / (1,100,000 + 12,000)
   = $1,554,911 / 1,112,000
   = $1.40

Problem 7

(a) Basic EPS = ($2,200,000 – 180,000) / 600,000
= $2,020,000 / 600,000
= $3.37

(b) Impact of conversion of bonds -
(1,000,000 x 8% x .58) / (1,000,000 / 1,000 x 30)
= $46,400 / 30,000 = $1.55 => Dilutive

Impact of conversion of preferred shares -
180,000 / (30,000 x 3)
= 180,000 / 90,000 = $2.00 => Dilutive

Impact of conversion of options -
50,000 - (50,000 x $20 / 27) = 12,963 increase in denominator

Order of entry: Options, Bonds, Preferred Shares

	Numerator	*Denominator*	*EPS*
Basic EPS	$2,020,000	600,000	$3.37
Options		12,963	
	2,020,000	612,963	$3.30
Bonds	46,400	30,000	
	2,066,400	642,963	$3.21
Preferred shares	180,000	90,000	
	2,246,400	732,963	$3.06

Fully diluted EPS = $3.06