

Chapter 15

Earnings per Share

J. Problems

P15-1. Suggested solution:

- a. EPS communicates how much of a company's reported profit or loss is attributable (belongs) to each ordinary share.
- b. Basic EPS is a concrete number that communicates "ownership" of earnings based on the average number of ordinary shares actually outstanding during the period. Diluted EPS is more abstract in nature as it conveys a hypothetical worst-case scenario in which the dilutive effect of all potential ordinary shares (POS) is considered.
- c. Potential ordinary shares (POS) are "a financial instrument or other contract that may entitle its holder to ordinary shares." In simple terms, POS represents items that are not currently ordinary shares that may be converted to ordinary shares at some time in the future.
- d. Examples of potential ordinary shares include convertible bonds, convertible preferred shares, stock options, and warrants.

P15-2. Suggested solution:

- a. $\text{Basic EPS} = \text{Net income available to ordinary shareholders} / \text{Weighted average number of ordinary shares outstanding}$
- b. Net income available to ordinary shareholders equals:
 - i) Net income; less
 - ii) Preferred shareholders' entitlement to dividends on cumulative preferred shares regardless of whether they were declared or paid; less
 - iii) Dividends declared on non-cumulative preferred shares without consideration of the stated entitlement or the amount paid
- c. Other comprehensive income does not affect the computation of EPS, as paragraph 7 of IAS 1 specifically excludes other comprehensive income from the determination of profit or loss.

P15-3. Suggested solution:

- a. Net income available to ordinary shareholders is affected by dividends on preferred shares as follows:
- i) Preferred shareholders' entitlement to dividends on cumulative preferred shares for that period is deducted from net income regardless of whether the dividends were declared or paid; and
 - ii) Dividends on non-cumulative preferred shares are deducted from net income only when declared.
- b. The underlying logic is rooted in the matching concept. Specifically:
- i) The obligation to pay dividends on cumulative preferred shares arises from the passage of time. The responsibility cannot be avoided as the preferred shareholders must receive all dividends due before any monies are distributed to ordinary shareholders. As such, it is appropriate to deduct the dividend entitlement from net income for the corresponding period even if it had not been declared.
 - ii) The company is not required to pay non-cumulative preferred dividends unless the board of directors declares them. Accordingly, it is proper to deduct dividends from net income only if they have been declared.
 - iii) EPS is based on profit or loss for the period, rather than cash flow, so dividends are deducted in the period to which they relate rather than when they are paid.

P15-4. Suggested solution:

	a.	b.	c.
Net income	\$5,000,000	\$5,000,000	\$5,000,000
Less: Cumulative preferred dividends	30,000	30,000	30,000
Less: Non-cumulative preferred dividends	<u>120,000</u>	<u>0</u>	<u>120,000</u>
Net income available to ordinary shareholders	<u>\$4,850,000</u>	<u>\$4,970,000</u>	<u>\$4,850,000</u>

The yearly dividend entitlement on the cumulative preferred shares is deducted from net income irrespective of whether dividends are declared or how much is paid out during the year.

The dividends on the non-cumulative preferred shares are deducted from net income only if they are declared. The declaration date, not the payment date, is the determining factor with respect to the period in which the declared dividends are deducted from net income.

P15-5. Suggested solution:

	a.	b.	c.
Net income	\$10,000,000	\$10,000,000	\$10,000,000
Less: Cumulative preferred dividends	80,000	80,000	80,000
Less: Non-cumulative preferred dividends	<u>180,000</u>	<u>0</u>	<u>120,000</u>
Net income available to ordinary shareholders	<u>\$ 9,740,000</u>	<u>\$ 9,920,000</u>	<u>\$9,800,000</u>

The yearly dividend entitlement on the cumulative preferred shares is deducted from net income irrespective of whether dividends are declared or how much is paid out during the year.

The dividends on the non-cumulative preferred shares are deducted from net income only if they are declared. The declaration date, not the payment date, is the determining factor with respect to the period in which the declared dividends are deducted from net income.

P15-6. Suggested solution:

	2015	2016
Net income	\$7,000,000	\$7,000,000
Less: Cumulative preferred dividends	20,000	40,000
Less: Non-cumulative preferred dividends	<u>0</u>	<u>15,000</u>
Net income available to ordinary shareholders	<u>\$6,980,000</u>	<u>\$6,945,000</u>

The dividend entitlement on the cumulative preferred shares is deducted from net income irrespective of whether dividends are declared or how much is paid out during the year. The shares were issued on July 1, 2015 so the entitlement in 2015 is 10,000 shares \times \$1 per quarter \times 2 quarters = \$20,000 and in 2016 is 10,000 shares \times \$1 per quarter \times 4 quarters = \$40,000

The dividends on the non-cumulative preferred shares are deducted from net income only if they are declared. The declaration date, not the payment date, is the determining factor with respect to the period in which the declared dividends are deducted from net income.

P15-7. Suggested solution:

- a. Treasury shares, stock splits, and stock dividends affect the determination of the weighted average number of shares outstanding (WASO) as follows:
- i) Treasury shares (where permitted) are issued but not outstanding. As such, they are not included in the determination of the weighted average number of shares *outstanding*.
 - ii) Stock splits affect the WASO as they result in an increased number of ordinary shares outstanding without a corresponding increase in company resources. The actual date of the stock split or dividend is not considered for WASO purposes; rather, the distribution is assumed to have occurred at the beginning of the year. From a practical perspective, the ordinary shares outstanding before the distribution must be restated to reflect the split or dividend. Moreover, all comparable EPS statistics must be adjusted to reflect the additional shares issued.
 - iii) Stock dividends affect the WASO in the same manner as stock splits.
- b. Three reasons that IFRS provides for a standardized adjustment date for stock splits and dividends include:
- i) Precluding possible manipulation of EPS by management through the discretionary timing of issuance
 - ii) Ensuring that EPS is prepared on a consistent basis by all companies
 - iii) Enhancing the comparability of EPS statistics

P15-8. Suggested solution:

a.

Date (2014)	Activity	Shares O/S	Fraction of year	WASO (OS × fraction)
Jan. 1–Mar. 31	Opening balance	150,000	3/12	37,500
Apr. 1– June 30	Issued 80,000 shares	230,000	3/12	57,500
July 1–Sept. 30	Repurchased 60,000 shares	170,000	3/12	42,500
Oct. 1–Dec. 31	Issued 20,000 shares	190,000	3/12	47,500
Weighted average number of ordinary shares outstanding				<u>185,000</u>

- b. The weighted average number of ordinary shares in 2014 will not change. Treasury shares are issued but not *outstanding*; we are calculating the weighted average number of ordinary shares *outstanding*.

P15-9. Suggested solution:

Date (2014)	Activity	Shares O/S (A)	Adj. factor (B)	Fraction of year (C)	WASO (A × B × C)
Jan. 1–Mar. 31	Opening balance	150,000	2.0×1.1 (3)	3/12	82,500
Apr. 1–May 31	Issued 80,000 shares	230,000	2.0×1.1 (3)	2/12	84,333
June 1–June 30	2:1 stock split	460,000 (1)	1.1 (4)	1/12	42,167
July 1–Sept. 30	Repurchased 60,000 shares	400,000	1.1 (4)	3/12	110,000
Oct. 1–Oct. 31	Issued 20,000 shares	420,000	1.1 (4)	1/12	38,500
Nov. 1–Dec. 31	10% stock dividend	462,000 (2)	(5)	2/12	<u>77,000</u>
Weighted average number of ordinary shares outstanding					<u>434,500</u>
Supporting comments and computations					
(1) $230,000 \times 2 = 460,000$					
(2) $420,000 \times 1.1 = 462,000$					
(3) For WASO purposes we assume that the stock split and stock dividend both took place at the beginning of the year. We adjust for this by multiplying the actual number of shares outstanding by 2 (2:1 stock split) and then again by 1.1 (1 + 10% stock dividend).					
(4) As the outstanding number of shares includes those issued in the stock split, we only need to adjust it for the stock dividend.					
(5) As the outstanding number of shares includes those issued in the stock split and stock dividend, we need not make any further adjustments.					

P15-10. Suggested solution:

Date (2014)	Activity	Shares O/S (A)	Adj. factor (B)	Fraction of year (C)	WASO (A × B × C)
Jan. 1–Jan. 31	Opening balance	100,000	1.5×1.2 (4)	1/12	15,000
Feb. 1–May 31	Repurchased 50,000 shares; held 20,000 as treasury	50,000 (1)	1.5×1.2	4/12	30,000
June 1–June 30	1.5:1 stock split	75,000 (2)	1.2 (5)	1/12	7,500
July 1–Sept. 30	Issued 80,000 shares, 10,000 of which were from treasury	155,000 (1)	1.2 (5)	3/12	46,500
Oct. 1–Oct. 31	Issued 20,000 shares	175,000	1.2 (5)	1/12	17,500
Nov. 1–Dec. 31	20% stock dividend	210,000 (3)	(6)	2/12	<u>35,000</u>
Weighted average number of ordinary shares outstanding					<u>151,500</u>
Supporting comments and computations					
(1) Treasury shares are issued but not <i>outstanding</i> ; we are calculating the weighted average number of ordinary shares <i>outstanding</i> .					

- (2) $50,000 \times 1.5 = 75,000$
 (3) $175,000 \times 1.2 = 210,000$
 (4) For WASO purposes we assume that the stock split and stock dividend both took place at the beginning of the year. We adjust for this by multiplying the actual number of shares outstanding by 1.5 (1.5:1 stock split) and then again by 1.2 (1 + 20% stock dividend).
 (5) As the outstanding number of shares includes those issued in the stock split, we only need to adjust it for the stock dividend.
 (6) As the outstanding number of shares includes those issued in the stock split and stock dividend, we need not make any further adjustments.

P15-11. Suggested solution:

a. Computation of basic EPS

Net income			\$800,000
Less: Preferred dividends cumulative preferred shares	(1)	$20,000 \times \$100 \times 3\%$	(60,000)
Less: Preferred dividends non-cumulative preferred shares		$500,000 \times 4\%$	(20,000)
NI available to ordinary shareholders			<u>\$720,000</u>
Basic EPS		$\$720,000 / 200,000$	<u>\$3.60</u>

Supporting comments and computations

- (1) Dividends were last declared and paid in full in 2012. While the dividend arrears on the cumulative preferred shares for 2013 must be paid before any monies are distributed to the ordinary shareholders, only the dividend entitlement for 2014 is considered for EPS purposes.

b. Determination of the dividends per ordinary share in 2014

\$180,000 dividends were declared and paid in 2014 allocated as follows	
Total dividends declared and paid in 2014	\$180,000
Less: Declared and paid on the cumulative preferred shares (20,000 × \$100 × 3% × 2 years)	(120,000)
Less: Declared and paid on the non-cumulative preferred shares (500,000 × 4%)	(20,000)
Declared and paid on ordinary shares (\$180,000 - \$120,000 - \$20,000)	<u>\$ 40,000</u>
Dividends per ordinary share \$40,000 / 200,000	<u>\$0.20</u>

P15-12. Suggested solution:

	Situation a. (Both cumulative)		Situation b. (A cumulative, B non-cumulative)		Situation c. (Both non-cumulative)	
Net income		\$400,000		\$400,000		\$400,000
Less: Preferred dividends "A"	10,000 × \$100 × 4%	(40,000)	10,000 × \$100 × 4%	(40,000)	10,000 × \$100 × 4%	(40,000)
Less: Preferred dividends "B"	20,000 × \$100 × 5%	<u>(100,000)</u>	20,000 × \$100 × 5%	<u>(100,000)</u>	20,000 × \$100 × 5%	<u>(100,000)</u>
NI available to ordinary shareholders		<u>\$260,000</u>		<u>\$260,000</u>		<u>\$260,000</u>
Basic EPS	\$260,000 / 100,000	<u>\$2.60</u>	\$260,000 / 100,000	<u>\$2.60</u>	\$260,000 / 100,000	<u>\$2.60</u>

Supporting comment (all situations)—\$200,000 in dividends are declared and paid, which is more than sufficient to attend to paying both the preferred series A and B in full. The remaining \$60,000 (\$200,000 – \$40,000 – \$100,000) is distributed to the ordinary shareholders; however, this does not affect EPS.

Supporting comment (situation a.)—The dividends on both series of preferred shares are cumulative and accordingly are deducted from net income irrespective of whether they have been declared or paid. The dividend entitlement on both series of preferred shares must be paid before monies can be distributed to ordinary shareholders.

Supporting comment (situation b.)—The dividends on the series A preferred are cumulative and accordingly are deducted from net income irrespective of whether they have been declared or paid. The dividends on the series B preferred shares are non-cumulative in nature. They have been deducted from net income as they were declared during the year.

Supporting comment (situation c.)—The dividends on both series of preferred shares are non-cumulative. They have been deducted from net income as they were declared during the year.

P15-13. Suggested solution:

	Situation a. (Both cumulative)		Situation b. (A cumulative, B non-cumulative)		Situation c. (Both non-cumulative)	
Net income		\$300,000		\$300,000		\$300,000
Less: Preferred dividends "A"	10,000 × \$100 × 4%	(40,000)	10,000 × \$100 × 4%	(40,000)	10,000 × \$100 × 4%	(40,000)
Less: Preferred dividends "B"	20,000 × \$100 × 5%	<u>(100,000)</u>	\$100,000 – \$40,000	<u>(60,000)</u>	\$100,000 – \$40,000	<u>(60,000)</u>
NI available to ordinary shareholders		<u>\$160,000</u>		<u>\$200,000</u>		<u>\$200,000</u>
Basic EPS	\$160,000 / 100,000	<u>\$1.60</u>	\$200,000 / 100,000	<u>\$2.00</u>	\$200,000 / 100,000	<u>\$2.00</u>
Supporting comment (all situations) —\$100,000 in dividends are declared and paid, which is insufficient to attend to paying both the preferred series A and B in full. As such, no monies are distributed to the ordinary shareholders.						
Supporting comment (situation a.) —The dividends on both series of preferred shares are cumulative and accordingly are deducted from net income irrespective of whether they have been declared or paid. The dividend entitlement on both series of preferred shares must be paid before monies can be distributed to ordinary shareholders.						
Supporting comment (situation b.) —The dividends on the series A preferred are cumulative and accordingly are deducted from net income irrespective of whether they have been declared or paid. The dividends on the series B preferred shares are non-cumulative in nature. Accordingly, only the \$60,000 dividend declaration pertaining to the series B preferred shares (\$100,000 – \$40,000) is deducted from net income available to ordinary shareholders.						
Supporting comment (situation c.) —The dividend declaration of \$100,000 is insufficient to satisfy both series current entitlement. As dividends on both series of preferred shares are non-cumulative, only the \$100,000 declared has been deducted from net income available to ordinary shareholders.						

P15-14. Suggested solution:

	Situation a. (Both cumulative)		Situation b. (A cumulative, B non-cumulative)		Situation c. (Both non-cumulative)	
Net income		\$200,000		\$200,000		\$200,000
Less: Preferred dividends "A"	10,000 × \$100 × 4%	(40,000)	10,000 × \$100 × 4%	(40,000)		(0)
Less: Preferred dividends "B"	20,000 × \$100 × 5%	<u>(100,000)</u>		<u>(0)</u>		<u>(0)</u>
NI available to ordinary shareholders		<u>\$60,000</u>		<u>\$160,000</u>		<u>\$200,000</u>
Basic EPS	\$60,000 / 100,000	<u>\$0.60</u>	\$160,000 / 100,000	<u>\$1.60</u>	\$200,000 / 100,000	<u>\$2.00</u>

Supporting comment (all situations)—Dividends are neither declared nor paid.

Supporting comment (situation a.)—The dividends on both series of preferred shares are cumulative and accordingly are deducted from net income irrespective of whether they have been declared or paid. The dividend entitlement on both series of preferred shares must be paid before monies can be distributed to ordinary shareholders.

Supporting comment (situation b.)—The dividends on the series A preferred are cumulative and accordingly are deducted from net income irrespective of whether they have been declared or paid. The dividends on the series B preferreds are non-cumulative in nature and are ignored for EPS purposes as they were not declared.

Supporting comment (situation c.)—The dividends on both series of preferred shares are non-cumulative in nature and are ignored for EPS purposes as they were not declared.

P15-15. Suggested solution:

a. Calculation of weighted average number of ordinary shares outstanding

Date (2015)	Activity	Shares O/S	Adj. factor	Fraction of year	WASO (OS × AF × fraction)
Jan. 1–Feb. 28	Opening balance	100,000	3.0 × 1.1 (3)	2/12	55,000
Mar. 1–Mar. 31	Issued 30,000 shares	130,000	3.0 × 1.1 (3)	1/12	35,750
Apr. 1–June 30	10% stock dividend	143,000 (1)	3.0 (4)	3/12	107,250
July 1–Sept. 30	Repurchased 20,000 shares	123,000	3.0 (4)	3/12	92,250
Oct. 1–Dec. 31	3-for-1 stock split	369,000 (2)	(5)	3/12	<u>92,250</u>
Weighted average number of ordinary shares outstanding					<u>382,500</u>

Supporting comments and computations

- (1) $130,000 \times (1 + 10\%) = 143,000$
- (2) $123,000 \times 3 = 369,000$
- (3) For WASO purposes we assume that the stock split and stock dividend both took place at the beginning of the year. We adjust for this by multiplying the actual number of shares outstanding by 3 (3:1 stock split) and then again by 1.1 (1 + 10% stock dividend).
- (4) As the outstanding number of shares includes those issued in the stock dividend, we only need to adjust it for the stock split.
- (5) As the outstanding number of shares includes those issued in the stock split and stock dividend, we need not make any further adjustments.

b. Calculation of basic EPS

Net income		\$250,000
Less: Preferred dividends		
– cumulative – amount of entitlement	$10,000 \times \$100 \times 5\% \times 11/12^*$	<u>(45,833)</u>
Net income available to ordinary shareholders		<u>\$204,167</u>
Basic EPS	$\$204,167 / 382,500$	<u>\$0.53</u>

*As the shares were issued during the year we must pro-rate the dividend entitlement

c. Basic EPS if preferred shares are non-cumulative

Net income		\$250,000
Less: Preferred dividends		
– non-cumulative – amount declared		<u>(0)</u>
Net income available to ordinary shareholders		<u>\$250,000</u>
Basic EPS	$\$250,000 / 382,500$	<u>\$0.65</u>

P15-16. Suggested solution

a.

Date (2014)	Activity	Shares O/S (A)	Adj. factor (B)	Fraction of year (C)	WASO (A × B × C)
Jan. 1–Jan. 31	Opening balance	60,000 (1)	2.0 (4)	1/12	10,000
Feb. 1–May 31	Issued 15,000 shares	75,000	2.0 (4)	4/12	50,000
June 1–Aug. 31	Repurchased 20,000 shares	55,000 (2)	2.0 (4)	3/12	27,500
Sept. 1–Sept. 30	Reissued 20,000 shares held in treasury	75,000 (2)	2.0 (4)	1/12	12,500
Oct. 1–Dec. 31	Two-for-one stock split	150,000 (3)	(5)	3/12	<u>37,500</u>
Weighted average number of ordinary shares outstanding					<u>137,500</u>

Supporting comments and computations(1) From 2013: $50,000 + 10,000 = 60,000$ (2) The fact that the repurchased shares are held in treasury is irrelevant as we are interested in *outstanding* shares, not *issued* shares(3) $75,000 \times 2 = 150,000$

(4) For WASO purposes we assume that the stock split took place at the beginning of the year. We adjust for this by multiplying the actual number of shares outstanding by 2 (2:1 stock split)

(5) As the outstanding number of shares includes those issued in the stock split, we need not make any further adjustments.

b. Calculation of basic EPS

Net income		\$500,000
Less: Preferred dividends		
– cumulative – amount of entitlement	$50,000 \times \$100 \times 4\%$	(200,000)
– non-cumulative – amount declared	$\$60,000 + \$60,000$	<u>(120,000)</u>
		<u>\$180,000</u>
Basic EPS	$\$180,000 / 137,500$	<u>\$1.31</u>

P15-17. Suggested solution:

a.

Date	Activity	Shares O/S (A)	Adj. factor (B)	Fraction of year (C)	WASO (A × B × C)
(2015)					
Jan. 1–Mar. 31	Opening balance	100,000		3/12	25,000
Apr. 1–Dec. 31	Issued 25,000 shares	125,000		9/12	<u>93,750</u>
Weighted average number of ordinary shares outstanding Dec. 31, 2015					<u>118,750</u>

(2016)						
Jan. 1–Jan. 31	Opening balance	125,000	1.15	1/12	11,979	
Feb. 1–Apr. 30	Repurchased 35,000 shares	90,000	1.15	3/12	25,875	
May 1–Dec. 31	15% stock dividend (90,000 × (1 + 15%))	103,500		8/12	<u>69,000</u>	
Weighted average number of ordinary shares outstanding Dec. 31, 2016					<u>106,854</u>	
(2017)						
Jan. 1–Mar. 31	Opening balance	103,500	1.5	3/12	38,813	
Apr. 1–Sept. 30	Issued 46,500 shares	150,000	1.5	6/12	112,500	
Oct. 1–Dec. 31	1.5-for-1 stock split (150,000 × 1.5)	225,000		3/12	<u>56,250</u>	
Weighted average number of ordinary shares outstanding Dec. 31, 2017					<u>207,563</u>	

b. Basic EPS as reported in each year

Basic EPS 2015	\$300,000 / 118,750	<u>\$2.53</u>
Basic EPS 2016	\$250,000 / 106,854	<u>\$2.34</u>
Basic EPS 2017	\$350,000 / 207,563	<u>\$1.69</u>

c. Basic EPS reported on 2017 financial statements

Date	Activity	Shares O/S (A)	Adj. factor (B)	Fraction of year (C)	WASO (A × B × C)
(2015)					
Jan. 1–Mar. 31	Opening balance	100,000	1.15 × 1.5	3/12	43,125
Apr. 1–Dec. 31	Issued 25,000 shares	125,000	1.15 × 1.5	9/12	<u>161,719</u>
Weighted average number of ordinary shares outstanding Dec. 31, 2015					<u>204,844</u>
(2016)					
Jan. 1–Jan. 31	Opening balance	125,000	1.15 × 1.5	1/12	17,969
Feb. 1–Apr. 30	Repurchased 35,000 shares	90,000	1.15 × 1.5	3/12	38,812
May 1–Dec. 31	15% stock dividend (90,000 × (1 + 15%))	103,500	1.5	8/12	<u>103,500</u>
Weighted average number of ordinary shares outstanding Dec. 31, 2016					<u>160,281</u>
(2017) Calculations unchanged from part a.					
Weighted average number of ordinary shares outstanding Dec. 31, 2017					<u>207,563</u>

Alternatively, the restatement amounts can be determined as follows:

2015: Restate WASO for subsequent stock dividends and stock split:

$$118,750 \times 1.15 \times 1.5 = 204,844$$

2016: Restate WASO for subsequent stock split:

$$106,854 \times 1.5 = 160,281$$

2017: Latest year of financial report; no restatement necessary

d. Basic EPS restated

Basic EPS 2015	\$300,000 / 204,844	<u>\$1.46</u>
Basic EPS 2016	\$250,000 / 160,281	<u>\$1.56</u>
Basic EPS 2017	\$350,000 / 207,563	<u>\$1.69</u>

- e. The adjusted EPS statistics calculated in part d provide better information for decision-making purposes as they are more comparable. This is because the differences arising from the effects of capital transactions that do not affect net assets are neutralized by similarly restating each year under consideration.

P15-18. Suggested solution:

a. Calculation of weighted average number of ordinary shares outstanding

Date (2014)	Activity	Shares O/S		Adj. Factor	Fraction of year	WASO (OS × AF × fraction)	
Jan. 1–Feb. 28	Opening balance	50,000		$2.0 \times$ 1.15	(4)	2/12	19,167
Mar. 1–June 30	Issued 20,000 shares	70,000		$2.0 \times$ 1.15	(4)	4/12	53,667
July 1–July 31	15% stock dividend	80,500	(1)	2.0	(5)	1/12	13,417
Aug. 1 - Sept. 30	Repurchased 30,500 shares and held them as treasury	50,000	(2)	2.0	(5)	2/12	16,667
Oct. 1–Dec. 31	2-for-1 stock split	100,000	(3)		(6)	3/12	<u>25,000</u>
Weighted average number of ordinary shares outstanding							<u>127,918</u>

Supporting comments and computations

- (1) $70,000 \times (1 + 15\%) = 80,500$
- (2) Treasury shares are issued but not *outstanding*; we are calculating the weighted average number of ordinary shares *outstanding*.
- (3) $50,000 \times 2 = 100,000$
- (4) For WASO purposes we assume that the stock split and stock dividend both took place at the beginning of the year. We adjust for this by multiplying the actual number of shares outstanding by 2 (2:1 stock split) and then again by 1.15 (1 + 15% stock dividend).
- (5) As the outstanding number of shares includes those issued in the stock dividend, we only need to adjust it for the stock split.
- (6) As the outstanding number of shares includes those issued in the stock split and stock dividend, we need not make any further adjustments.

b. Calculation of basic EPS

Net income		\$500,000
Less: Preferred dividends		
– cumulative – amount of entitlement	$\$2,000,000 \times 3\% \times 9/12^*$	<u>(45,000)</u>
Net income available to ordinary shareholders		<u>\$455,000</u>
Basic EPS	$\$455,000 / 127,918$	<u>\$3.56</u>

*As the shares were issued during the year we must pro-rate the dividend entitlement

c. Basic EPs if preferred shares are non-cumulative

Net income		\$500,000
Less: Preferred dividends		
– non-cumulative – amount declared		<u>(0)</u>
Net income available to ordinary shareholders		<u>\$500,000</u>
Basic EPS	$\$500,000 / 127,918$	<u>\$3.91</u>

d. Price earnings ratio (PE ratio) = market price of share / basic earnings per share = $\$30.00 / \$3.56 = 8.4:1$

P15-19. Suggested solution:

a. Weighted average number of shares outstanding in 2013

Date (2013)	Activity	Shares O/S (A)	Adj. factor (B)	Fraction of year (C)	WASO (A × B × C)
Jan. 1–Sept. 30	Opening balance	25,000		9/12	18,750
Oct. 1 - Dec. 31	Repurchased 10,000 shares	15,000		3/12	3,750
Weighted average number of ordinary shares outstanding in 2013					<u>22,500</u>

b. Weighted average number of shares outstanding in 2014

Date (2014)	Activity	Shares	Adj. factor	Fraction of year	WASO
Jan. 1–Feb. 28	Opening balance	15,000	(1)	3.0 (4)	2/12 7,500
Mar. 1 - May 31	Issued 20,000 shares	35,000		3.0 (4)	3/12 26,250
June 1–Aug. 31	Repurchased 10,000 shares and held them as treasury shares	25,000	(2)	3.0 (4)	3/12 18,750
Sept. 1–Sept. 30	Reissued 5,000 shares held in treasury	30,000	(2)	3.0 (4)	1/12 7,500
Oct. 1–Dec. 31	Three-for-one stock split	90,000	(3)	(5)	3/12 <u>22,500</u>
Weighted average number of ordinary shares outstanding in 2014					<u>82,500</u>

Supporting comments and computations

(1) Carried forward from December 31, 2013

(2) The fact that the repurchased shares are held in treasury is irrelevant as we are interested in *outstanding* shares, not *issued* shares

(3) $30,000 \times 3 = 90,000$

(4) For WASO purposes we assume that the stock split took place at the beginning of the year. We adjust for this by multiplying the actual number of shares outstanding by 3 (3:1 stock split)

(5) As the outstanding number of shares includes those issued in the stock split, we need not make any further adjustments.

c. Calculation of basic EPS for 2013

Net income			\$200,000
Less: Preferred dividends			
– cumulative – amount of entitlement	(1)	$\$100,000 \times 3\% \times 10/12$	(2,500)
– non-cumulative – amount declared	(2)(3)	$\$200,000 \times 4\%$	<u>(8,000)</u>
			<u>\$189,500</u>
Basic EPS		$\$189,500 / 22,500$	<u>\$8.42</u>

Supporting comments and computations

(1) The dividend entitlement on the cumulative preferred shares is deducted from net income irrespective of whether dividends are declared or how much is paid out during the year. The shares were issued during the year so we must pro-rate the dividend entitlement.

(2) \$200,000 in dividends were declared during the year. The stipulated dividends on the preferreds, including all arrears must be paid before any monies can be distributed to the ordinary shareholders.

- The cumulative preferred shares cannot be in arrears as they were issued during the year.

- The \$50,000 in dividends declared is more than sufficient to attend to the \$2,500 cumulative preferred and the \$8,000 non-cumulative preferred entitlement for the year, hence dividends must have been declared on the non-cumulative preferred shares.

(3) The dividends on the non-cumulative preferred shares are deducted from net income only if they are declared. The declaration date, not the payment date, is the determining factor with respect to the period in which the declared dividends are deducted from net income.

d. Calculation of basic EPS for 2014

Net income			\$500,000
Less: Preferred dividends			
– cumulative – amount of entitlement	(1)	$\$100,000 \times 3\%$	(3,000)
– non-cumulative – amount declared	(2)		<u>(0)</u>
			<u>\$497,000</u>
Basic EPS		$\$497,000 / 82,500$	<u>\$6.02</u>

Supporting comments and computations

- (1) The dividend entitlement on the cumulative preferred shares is deducted from net income irrespective of whether dividends are declared or how much is paid out during the year.
 (2) The dividends on the non-cumulative preferreds are deducted from net income only if declared.

e. Calculation of basic EPS for 2013 as reported in Blue's 2014 comparative financial statements

Basic EPS	(1) $\$189,500 / (22,500 \times 3)$	<u>\$2.81</u>
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Supporting comments and computations

- (1) For purpose of presenting Blue's 2013 EPS in its 2014 comparative financial statements, the weighted average number of ordinary shares outstanding for 2013 must be adjusted for the stock split in 2014.

P15-20. Suggested solution:

- A simple capital structure is one that does not include any potential ordinary shares.
- A complex capital structure is one that includes potential ordinary shares.
- An in-the-money call option is one in which the market price of the share exceeds the exercise (strike) price.
- An at-the-money call option is one in which the market price of the share equals the exercise (strike) price.
- An out-of-the-money call option is one in which the market price of the share is less than the exercise (strike) price.

P15-21. Suggested solution:

a.					
Basic EPS		\$2,000,000 / 1,000,000*			<u>\$2.00</u>
*The preferred shares in Company C are non-cumulative and dividends were not declared during the year. Hence, net income available to ordinary equals the reported net income.					
b. Incremental EPS					c. Dilutive?
Company	Potential ordinary shares	Income effect	Share effect	Incremental EPS	
A	Stock option	\$0	IS = $N(1 - K/S) = 10,000(1 - \$32/\$35) = 857$ (rounded)	\$0.00	Dilutive
B	Stock option	\$0	IS = $N(1 - K/S) = 5,000(1 - \$30/\$35) = 714$ (rounded)	\$0.00	Dilutive
C	Convertible preferred	\$0**	$(\$1,000,000 / \$100) \times 3 = 30,000$	$\$0 / 30,000 = \0.00	Dilutive
D	Convertible bond	$(\$2,000,000 \times .05) \times (1 - 30\%) = \$70,000$	$\$2,000,000 / \$1,000 \times 15 = 30,000$	$\$70,000 / 30,000 = \2.33	Antidilutive
**Dividends were not declared on the non-cumulative shares.					
IS = number of incremental shares to be issued; K = exercise price; N = number of shares that would have been issued for option exercise; S = average market price					

P15-22. Suggested solution:

a.					
Basic EPS - companies A, B, and C		\$1,000,000 / 600,000			<u>\$1.67</u>
Basic EPS - company D		(\$1,000,000 - \$32,000*) / 600,000			<u>\$1.61</u>
* \$800,000 x 4% = \$32,000					
b. Incremental EPS					c. Dilutive?
Company	Potential ordinary shares	Income effect	Share effect	Incremental EPS	
A	Stock option	\$0	IS = $N(1 - K/S) = 20,000(1 - \$20/\$25) = 4,000$ (rounded)	\$0.00	Dilutive
B	Stock option	\$0	IS = $N(1 - K/S) = 10,000(1 - \$26/\$25) = -400$	\$0.00	Antidilutive
C	Convertible bond	$(\$1,000,000 \times .05) \times (1 - 40\%) = \$30,000$	$\$1,000,000 / \$1,000 \times 20 = 20,000$	$\$30,000 / 20,000 = \1.50	Dilutive
D	Convertible preferred	\$32,000	$(\$800,000 / \$100) \times 2 = 16,000$	$\$32,000 / 16,000 = \2.00	Antidilutive
IS = number of incremental shares to be issued; K = exercise price; N = number of shares that would have been issued for option exercise; S = average market price					

P15-23. Suggested solution:

- a. Diluted EPS = (Net income available to ordinary shareholders + the income effect of dilutive potential ordinary shares) / (Weighted average number of ordinary shares outstanding + the share effect of dilutive potential ordinary shares).
- b. Dilutive potential ordinary shares (POS) are financial instruments or agreements that if exercised would result in basic EPS decreasing. Antidilutive POS are financial instruments or agreements that if exercised would result in basic EPS increasing. Dilutive POS are included in the determination of diluted EPS while antidilutive POS are ignored.
- c. The process for identifying dilutive and antidilutive POS and calculating diluted EPS follows:
 - i) Identify all potential ordinary shares
 - ii) Compute incremental EPS for each category of potential ordinary shares
 - a. Calculate incremental EPS on convertible bonds and convertible preferred shares using the if-converted method
 - b. Determine incremental EPS on warrants and options using the treasury stock method

- iii) Rank incremental EPS on potential ordinary shares from the lowest (the most dilutive) to the highest (least dilutive)
- iv) Sequentially compare incremental EPS to provisional EPS. If incremental EPS is lower than provisional EPS, include the POS in the diluted EPS computation and check the next rank-ordered item for dilutiveness. Continue the process until incremental EPS exceeds provisional EPS. At this point, further calculations are not required as the last recorded provisional EPS equals diluted EPS.

P15-24. Suggested solution:

Rip's basic and diluted EPS are \$3.21 and \$3.14, respectively, determined as follows:

Net income to ordinary shareholders					
Net income					\$700,000
Less: Preferred dividends		100,000 × \$2.00			<u>\$(200,000)</u>
					<u>\$500,000</u>
Weighted average number of ordinary shares outstanding					
Date (2015)	Activity	Shares O/S	Adjustment factor	Fraction of year	WASO (OS × AF × fraction)
Jan. 1–Apr. 30	Opening balance	50,000	3.0	4/12	50,000
May 1–Oct. 31	3-for-1 stock split	150,000	1	6/12	75,000
Nov. 1–Nov. 30	Issued 30,000 shares	180,000	1	1/12	15,000
Dec. 1–Dec. 31	Bond conversion – 12,000 shares	192,000	1	1/12	<u>16,000</u>
Weighted average number of ordinary shares outstanding					<u>156,000</u>
Basic EPS		\$500,000 / 156,000			<u>\$3.21</u>
Incremental EPS / Rank the dilutiveness of POS					
Potential ordinary shares	Income effect	Share effect	Incremental EPS	Rank order	
Convertible bonds A	$(\$1,000,000 \times .06) \times (1 - 40\%) \times 6/12^* = \$18,000$	$(\$1,000,000 / \$1,000) \times 14 \times 6/12 = 7,000$	\$2.57	2	
Convertible bonds B	$(\$1,000,000 \times .05) \times (1 - 40\%) \times 11/12^{**} = \$27,500$	$(\$1,000,000 / \$1,000) \times 12 \times 11/12 = 11,000$	\$2.50	1	
<p>*As the bonds were issued during the year, the income and share effect both need to be pro-rated.</p> <p>**As the bonds were converted during the year, the income effect is calculated only for the period that the bonds were outstanding. Similarly, the potential ordinary shares are pro-rated for the period the convertible security was outstanding. Factoring in the partial year does not affect incremental EPS because the same adjustment is made to the numerator (income effect) and denominator (share effect). However, the partial year adjustment does affect the calculation of diluted EPS, as determined below.</p>					

Sequentially compare the incremental EPS to the provisional EPS to determine diluted EPS					
	Income	Shares	Basic EPS	Provisional EPS	Diluted EPS
Basic EPS	\$500,000	156,000	\$3.21		
Bond B	<u>27,500</u>	<u>11,000</u>			
Provisional EPS	\$527,500	167,000		\$3.16	
Bond A	<u>18,000</u>	<u>7,000</u>			
Diluted earnings per share	<u>\$545,500</u>	<u>174,000</u>			<u>\$3.14</u>

P15-25. Suggested solution:

Jamie's basic and diluted EPS are \$5.33 and \$4.14, respectively, determined as follows:

Net income to ordinary shareholders					
Net income					\$900,000
Less: Preferred dividends		100,000 × \$3.00*			<u>\$(300,000)</u>
					<u>\$600,000</u>
*The dividend entitlement on the cumulative preferred shares is deducted from net income irrespective of whether dividends are declared or how much is paid out during the year.					
Weighted average number of ordinary shares outstanding					
Date (2015)	Activity	Shares O/S	Adjustment factor	Fraction of year	WASO (OS × AF × fraction)
Jan. 1–May. 31	Opening balance	100,000	1.1	5/12	45,833
June 1–Sept. 30	10% stock dividend	110,000	1	4/12	36,667
Oct. 1–Dec. 31	Issued 10,000 shares	120,000	1	3/12	<u>30,000</u>
Weighted average number of ordinary shares outstanding					<u>112,500</u>
Basic EPS	\$600,000 / 112,500				<u>\$5.33</u>
Incremental EPS / Rank the dilutiveness of POS					
Potential ordinary shares	Income effect	Share effect	Incremental EPS	Rank order	
Convertible bonds A	$(\$500,000 \times .04) \times (1 - 30\%) \times =$ \$14,000	$(\$500,000 / \$1,000) \times 10 = 5,000$	\$2.80	2	
Convertible bonds B	$(\$500,000 \times .03) \times (1 - 30\%) =$ \$10,500	$(\$500,000 / \$1,000) \times 12 = 6,000$	\$1.75	1	
Convertible preferred shares	$100,000 \times \$3.00 =$ \$300,000	$100,000 \times 1 = 100,000$	\$3.00	3	

Sequentially compare the incremental EPS to the provisional EPS to determine diluted EPS					
	Income	Shares	Basic EPS	Provisional EPS	Diluted EPS
Basic EPS	\$600,000	112,500	\$5.33		
Bond B	<u>10,500</u>	<u>6,000</u>			
Provisional EPS	610,500	118,500		\$5.15	
Bond A	<u>14,000</u>	<u>5,000</u>			
Provisional EPS	624,500	123,500		\$5.06	
Preferred shares	<u>300,000</u>	<u>100,000</u>			
Diluted earnings per share	<u>\$924,500</u>	<u>223,500</u>			<u>\$4.14</u>

d. Price earnings ratio (PE ratio) = market price of share / basic earnings per share = \$60.00 / \$5.33 = 11.3:1

P15-26. Suggested solution:

Ron's basic and diluted EPS are \$5.09 and \$4.83, respectively, determined as follows:

Net income to ordinary shareholders					
Net income*					<u>\$140,000</u>
* The dividends on the non-cumulative preferred shares are deducted from net income only if they are declared.					
Weighted average number of ordinary shares outstanding					
Date (2015)	Activity	Shares O/S	Adjustment factor	Fraction of year	WASO (OS × AF × fraction)
Jan. 1–May. 31	Opening balance	60,000	0.5	5/12	12,500
June 1–Sept. 30	1-for-2 stock split	30,000	1	4/12	10,000
Oct. 1–Dec. 31	Repurchased 10,000 shares and held them in treasury*	20,000	1	3/12	5,000
Weighted average number of ordinary shares outstanding					<u>27,500</u>
Basic EPS					
	\$140,000 / 27,500				<u>\$5.09</u>
*Treasury shares are issued but not <i>outstanding</i> ; we are calculating the weighted average number of ordinary shares <i>outstanding</i> .					
Incremental EPS / Rank the dilutiveness of POS					
Potential ordinary shares	Income effect	Share effect		Incremental EPS	Rank order
Convertible bonds A	$(\$2,000,000 \times .03) \times (1 - 20\%) \times 3/12^* = \$12,000$	$(\$2,000,000 / \$1,000) \times 8 \times 3/12 = 4,000$		\$3.00	1

Convertible bonds B	$(\$1,000,000 \times .04) \times (1 - 20\%) = \$32,000$	$(\$1,000,000 / \$1,000) \times 6.5 = 6,500$	\$4.92	2
*As the bonds were issued during the year, the income and share effect both need to be pro-rated.				
Sequentially compare the incremental EPS to the provisional EPS to determine diluted EPS				
	Income	Shares	Basic EPS	Provisional EPS
Basic EPS	\$140,000	27,500	\$5.09	
Bond A	<u>12,000</u>	<u>4,000</u>		
Provisional EPS	\$152,000	31,500		\$4.83
Bond B is antidilutive and ignored	<u>0</u>	<u>0</u>		
Diluted earnings per share	<u>\$152,000</u>	<u>31,500</u>		<u>\$4.83</u>

P15-27. Suggested solution:

- a. The treasury stock method is the process used to determine the share effect for call options and warrants when the firm's capital structure includes these financial instruments.
- b. The treasury stock method is applied as follows:
 - i) For in-the-money options (the average market price > the exercise price) compute the cash to be received upon exercise of the options (cash received = number of shares to be delivered \times the strike price per share)
 - ii) Determine the number of shares that the proceeds will buy in the marketplace (number of purchased shares = cash to be received / average market price of shares)
 - iii) Calculate the number of incremental shares that the company will have to issue to meet its obligation (number of incremental shares = number of shares to be delivered – number of purchased shares)

The procedure assumes that the options were exercised at the beginning of the period.

Algebraically, this can be expressed as: $IS = [(S - K) / S] \times N$. Alternatively, this can be expressed as $IS = N(1 - K/S)$, where:

IS = number of incremental shares to be issued

K = exercise price

N = number of shares that would have been issued for option exercise

S = average market price

- c. The exception to the rule with respect to the assumed exercise date is when the security was issued during the year. If the warrant or option was issued during the year the incremental number of shares to be issued is pro-rated.

P15-28. Suggested solution:

a.		
Series	Dilutive or antidilutive	Reason
A	Dilutive	Exercise price < average market price; in the money
B	Neither dilutive nor antidilutive	Exercise price = average market price; at the money
C	Antidilutive	Exercise price > average market price; out of the money
D	Dilutive	Exercise price < average market price; in the money

b. From part a, series A and D are dilutive in nature.

Series	Equation	Alternate equation	# of incremental shares to be issued
A	$IS = [(S - K) / S] \times N$ $= [(20 - 19) / 20] \times 10,000$ $= 500$	$IS = N(1 - K/S)$ $= 10,000(1 - 19/20)$ $= 500$	500
D	$IS = [(S - K) / S] \times N \times 9/12^*$ $= [(20 - 18) / 20] \times 20,000 \times 9/12$ $= 1,500$	$IS = N(1 - K/S) \times 9/12^*$ $= 20,000(1 - 18/20) \times 9/12$ $= 1,500$	1,500
IS = number of incremental shares to be issued; K = exercise price; N = number of shares that would have been issued for option exercise; S = average market price.			
*The number of incremental shares to be notionally issued must be pro-rated as the options were not outstanding for the entire year.			

- c. The incremental EPS for each series is \$0. Recall that the treasury stock method completely reflects the dilution in the denominator (share effect) of the incremental EPS equation; no adjustment is made to the numerator of the equation (income effect).

P15-29. Suggested solution:

- a. Stock options A and B are dilutive, while stock option C is antidilutive. Stock options A and B are in the money: their exercise price is less than the market price of the shares. Stock option C is out of the money: its exercise price is greater than the market price of the shares. The rule in this respect is that if earnings per share from continuing operations is positive then in-the-money call options are dilutive and out-of-the-money options are antidilutive.

When there are multiple conversion options, as with stock option B, the most dilutive alternative is always considered—which in this case is \$22. Hence, stock option B is dilutive.

- b. The number of incremental shares arising from each of these option plans is as follows:
- i) Stock option A—5,000 shares [Number of incremental shares to be issued = [(average market price – strike price) / average market price] × number of options = (\$24 – \$20) / \$24 × 30,000 = 5,000]
 - ii) Stock option B—500 shares [Number of incremental shares to be issued = [(average market price – strike price) / average market price] × number of options = (\$24 – \$22) / \$24 × 6,000 = 500]
 - iii) Stock option C—0 (the options are antidilutive as they are out of the money)

- c. Yes, the answer to part b changes, because when options are issued during the year the incremental shares need to be pro-rated: [Number of incremental shares to be issued = [(average market price – strike price) / average market price] × number of options × fraction of year options outstanding = $(\$24 - \$20) / \$24 \times 30,000 \times 9 / 12 = 3,750$]

P15-30. Suggested solution:

a.		
Series	Dilutive or antidilutive	Reason
A	Dilutive	Exercise price < average market price; in the money
B	Dilutive	Most favourable exercise price < average market price; in the money
C	Dilutive	Exercise price < average market price; in the money

b. From part a, series A, B, and C are dilutive in nature.			
Series	Equation	Alternate equation	# of incremental shares to be issued
A	$IS = [(S - K) / S] \times N \times 6/12^*$ $= [(25 - 22) / 25] \times 10,000 \times 6/12$ $= 600$	$IS = N(1 - K/S) \times 6/12^*$ $= 10,000(1 - 22/25) \times 6/12$ $= 600$	600
B	$IS = [(S - K) / S] \times N$ $= [(25 - 23^{**}) / 25] \times 15,000$ $= 1,200$	$IS = N(1 - K/S)$ $= 15,000(1 - 23^{**}/25)$ $= 1,200$	1,200
C	$IS = [(S - K) / S] \times N \times 9/12^*$ $= [(25 - 21) / 25] \times 20,000 \times 9/12$ $= 2,400$	$IS = N(1 - K/S) \times 9/12^*$ $= 20,000(1 - 21/25) \times 9/12$ $= 2,400$	2,400
<p>IS = number of incremental shares to be issued; K = exercise price; N = number of shares that would have been issued for option exercise; S = average market price</p> <p>*The number of incremental shares to be notionally issued must be pro-rated as the options were not outstanding for the entire year.</p> <p>**When more than one conversion option is available, the most dilutive alternative is assumed.</p>			

Supplemental information to the solution:

The foregoing solution is correct according to IFRS IAS 33 paragraph 38. Note, however, that there are two logical inconsistencies in this standard regarding the fractional year adjustment. The first inconsistency has to do with the fact that the options expired, so at the time of the financial statement preparation, dilution is no longer possible. An impossibility is not a “potential ordinary share.” If we ignore the first inconsistency, then there is a problem with factoring in the partial year. For options issued during the year, it makes complete sense, because they can only be dilutive after issuance. However, for options that were outstanding at the beginning of the year, had those options been exercised at that date, then those shares would be outstanding for the entire year, independent of any expiry date.

P15-31. Suggested solution:

- a. Net income available to ordinary shareholders/ weighted average number of ordinary shares = $\$150,000 / 97,500^* = \1.54 .

*There were 100,000 ordinary shares outstanding at year-end, 10,000 of which were issued on April 1, 2014 in conjunction with the exercise of option C. $100,000 - 10,000 = 90,000$ post-split shares. $90,000 \times 3/12 + 100,000 \times 9/12 = 97,500$ WASO.

While there were only 45,000 ordinary shares outstanding from January 1 to February 28, 2014, these must be restated to reflect the 2-for-1 stock split on March 1, 2014.

- b. Stock options A, C, and D are dilutive as the exercise price is less than the average market price. Stock option B is antidilutive as the exercise price is greater than the average market price, hence it can be ignored.

Dilutive stock options do not have an income effect; therefore the incremental EPS of all dilutive options is \$0. It does not matter which order they are applied in to determine provisional EPS.

Option A [(average market price – strike price) / average market price] × number of options = $[(\$20 - \$15) / \$20] \times 10,000 = 2,500$ potential ordinary shares.

Option C [(average market price – strike price) / average market price] × number of options × period option outstanding = $[(\$20 - \$18) / \$20] \times 10,000 \times 3/12 = 250$ potential ordinary shares.

Option D [(average market price – strike price) / average market price] × number of options × period option outstanding = $[(\$20 - \$16) / \$20] \times 10,000 \times 4/12 = 667$ potential ordinary shares.

Weighted average ordinary shares for diluted EPS purposes = $97,500 + 2,500 + 250 + 667 = 100,917$.

Diluted EPS = $\$150,000 / 100,917 = \1.49 .

P15-32. Suggested solution:**a. Calculation of basic EPS**

Net income		\$150,000
Less: Preferred dividends	$10,000 \times \$0.32$	<u>(3,200)</u>
Net income available to ordinary shareholders		<u>\$146,800</u>
Basic EPS	$\$146,800 / 100,000$	<u>\$1.47</u>

Supporting comment—The dividends are cumulative and accordingly are deducted from net income even though they were not declared.

b. Incremental EPS / rank the dilutiveness of POS				
Potential ordinary shares	Income effect	Share effect	Incremental EPS	Rank order
Convertible bonds	$(\$500,000 \times .07) \times (1 - 25\%) = \$26,250$	$(\$500,000 / \$1,000) \times 30 = 15,000$	\$1.75	2
Convertible preferred shares	$10,000 \times \$0.32 = \$3,200$	$10,000 \times 2 = 20,000$	\$0.16	1

We do not need to do further calculations here. Clearly the convertible preferred shares are dilutive ($\$0.16 < \1.47) and the convertible bonds are antidilutive ($\$1.75 > \1.47).

c.	Income	Shares	Basic EPS	Provisional EPS	Diluted EPS
Basic EPS	\$146,800	100,000	\$1.47		
Preferred shares	<u>3,200</u>	<u>20,000</u>			
Provisional EPS	\$150,000	120,000		\$1.25	
Bonds are antidilutive and ignored	<u>0</u>	<u>0</u>			
Diluted earnings per share	<u>\$150,000</u>	<u>120,000</u>			<u>\$1.25</u>

P15-33. Suggested solution:

GDAC's basic and diluted EPS are \$1.98 and \$1.91, respectively, determined as follows.				
Net income to ordinary shareholders				
Net income				\$4,000,000
Less: Dividends on non-cumulative preferred shares*		$\$1,000,000 \times 5\%$		<u>\$(50,000)</u>
				<u>\$3,950,000</u>
*Deducted because they were declared				
Weighted average number of ordinary shares outstanding				
Weighted average number of ordinary shares outstanding (given)				<u>2,000,000</u>
Basic EPS	$\$3,950,000 / 2,000,000$			<u>\$1.98</u>
Incremental EPS / rank the dilutiveness of POS				
Potential ordinary shares	Income effect	Share effect	Incremental EPS	Rank order
Stock option A	\$0	$IS = N(1 - K/S) = 5,000(1 - \$15/\$17) = 588$ (rounded)	\$0.00	1
Stock option B	Exercise price (\$20.00) > average market price (\$17.00), therefore antidilutive		NA	anti-dilutive

Convertible preferred	$\$1,000,000 \times 5\% = \$50,000$	$(\$1,000,000 / \$100) \times 2 = 20,000$	$\$50,000 / 20,000 = \2.50	anti-dilutive	
Convertible bond	$(\$5,000,000 \times .07) \times (1 - 30\%) = \$245,000$	$\$5,000,000 / \$1,000 \times 40 = 200,000$	$\$245,000 / 200,000 = \1.23	2	
IS = number of incremental shares to be issued; K = exercise price; N = number of shares that would have been issued for option exercise; S = average market price					
Sequentially compare the incremental EPS to the provisional EPS to determine diluted EPS					
	Income	Shares	Basic EPS	Provisional EPS	Diluted EPS
Basic EPS	\$3,950,000	2,000,000	\$1.98		
Stock option A	<u>0</u>	<u>588</u>			
Provisional EPS	\$3,950,000	2,000,588		\$1.97	
Bonds	<u>245,000</u>	<u>200,000</u>			
Provisional EPS	\$4,195,000	2,200,588		\$1.91	
Both the convertible preferred shares and stock option B are antidilutive and ignored	<u>0</u>	<u>0</u>			
Diluted earnings per share	<u>\$4,195,000</u>	<u>2,200,588</u>			<u>\$1.91</u>

P15-34. Suggested solution:

Jill's basic and diluted EPS are \$6.67 and \$5.99, respectively, determined as follows.

Net income to ordinary shareholders					
Net income					\$800,000
Less: Preferred dividends – 4% cumulative			$\$400,000 \times 4\%$		<u>(16,000)</u>
					<u>\$784,000</u>
Dividends were not declared on the non-cumulative preferred shares and thus are ignored for EPS purposes.					
Weighted average number of ordinary shares outstanding					
Date (2018)	Activity	Shares O/S	Adjustment factor	Fraction of year	WASO (OS \times AF \times fraction)
Jan. 1–Feb. 28	Opening balance	50,000	2.0×1.2	2/12	20,000
Mar. 1–May 31	20% stock dividend	60,000	2	3/12	30,000
June 1–Nov. 30	2-for-1 stock split	120,000	1	6/12	60,000
Dec. 1–Dec. 31	Repurchased 30,000 shares	90,000	1	1/12	<u>7,500</u>
	Weighted average number of ordinary shares outstanding				<u>117,500</u>

Basic EPS	\$784,000 / 117,500			<u>\$6.67</u>	
Incremental EPS / rank the dilutiveness of POS					
Potential ordinary shares	Income effect	Share effect	Incremental EPS	Rank order	
7% convertible bonds	$(\$850,000 \times .07) \times (1 - 32\%) = \$40,460$	$(\$850,000 / \$1,000) \times 7.5 = 6,375$	\$6.35	2	
4% convertible preferred shares	$\$400,000 \times 4\% = \$16,000$	$\$400,000 / \$100 \times 4 = 16,000$	\$1.00	1	
Sequentially compare the incremental EPS to the provisional EPS to determine diluted EPS					
	Income	Shares	Basic EPS	Provisional EPS	Diluted EPS
Basic EPS	\$784,000	117,500	\$6.67		
Convertible preferred shares	<u>16,000</u>	<u>16,000</u>			
Provisional EPS	\$800,000	133,500		\$5.99	
Convertible bonds are antidilutive and ignored	<u>0</u>	<u>0</u>			
Diluted earnings per share	<u>\$800,000</u>	<u>133,500</u>			<u>\$5.99</u>

P15-35. Suggested solution:

Bobby's basic and diluted EPS are \$8.20 and \$6.93, respectively, determined as follows:

Net income to ordinary shareholders				
Net income				\$500,000
Less: Preferred dividends		$\$200,000 \times 4\%$		<u>(8,000)</u>
				<u>\$492,000</u>
The preferred shares are cumulative. For EPS purposes we subtract the annual entitlement.				
Weighted average number of ordinary shares outstanding				
Date (2016)	Activity	Shares O/S	Fraction of year	WASO (OS \times fraction)
Jan. 1–Mar. 31	Opening balance	50,000	3/12	12,500
Apr. 1–Apr. 30	Sold 20,000 shares	70,000	1/12	5,833
May 1–Nov. 30	Repurchased 10,000 shares	60,000	7/12	35,000
Dec. 1–Dec. 31	Sold 20,000 shares	80,000	1/12	<u>6,667</u>
	Weighted average number of ordinary shares outstanding			<u>60,000</u>
Basic EPS	\$492,000 / 60,000			<u>\$8.20</u>

Incremental EPS / rank the dilutiveness of POS					
Potential ordinary shares	Income effect	Share effect	Incremental EPS	Rank order	
6% convertible bonds	$(\$500,000 \times .06) \times (1 - 35\%) = \$19,500$	$(\$500,000 / \$1,000) \times 8 = 4,000$	\$4.88	2	
5% convertible bonds	$(\$700,000 \times .05) \times (1 - 35\%) = \$22,750$	$(\$700,000 / \$1,000) \times 6 = 4,200$	\$5.42	3	
4% convertible preferred shares	$\$200,000 \times 4\% = \$8,000$	$\$200,000 / \$100 \times 5 = 10,000$	\$0.80	1	
Sequentially compare the incremental EPS to the provisional EPS to determine diluted EPS					
	Income	Shares	Basic EPS	Provisional EPS	Diluted EPS
Basic EPS	\$492,000	60,000	\$8.20		
Convertible preferred shares	<u>8,000</u>	<u>10,000</u>			
Provisional EPS	\$500,000	70,000		\$7.14	
6% convertible bonds	<u>19,500</u>	<u>4,000</u>			
Provisional EPS	\$519,500	74,000		\$7.02	
5% convertible bonds	<u>22,750</u>	<u>4,200</u>			
Diluted earnings per share	<u>\$542,250</u>	<u>78,200</u>			<u>\$6.93</u>

d. Earnings per ordinary share	
Basic earnings per share	<u>\$8.20</u>
Diluted earnings per share	<u>\$6.93</u>

P15-36. Suggested solution:

a. Calculation of basic EPS		
Net income		\$300,000
Less: Preferred dividends	$4,000 \times \$2.00$	<u>(8,000)</u>
Net income available to ordinary shareholders		<u>\$292,000</u>
Basic EPS	$\$292,000 / 80,000$	<u>\$3.65</u>

Supporting comment— The dividend entitlement on the cumulative preferred shares is deducted from net income irrespective of whether dividends are declared or how much is paid out during the year.

b. Incremental EPS / rank the dilutiveness of POS				
Potential ordinary shares	Income effect	Share effect	Incremental EPS	Rank order
Convertible bonds	$(\$300,000 \times .04) \times (1 - 30\%) = \$8,400$	$(\$300,000 / \$1,000) \times 20 = 6,000$	\$1.40	2
Convertible preferred shares	$4,000 \times \$2.00 = \$8,000$	$4,000 \times 3 = 12,000$	\$0.67	1

Clearly the convertible preferred shares are dilutive ($\$0.67 < \3.65) and it appears that the convertible bonds are as well. This will be confirmed in part c ($\$1.40 < \3.26).

c.	Income	Shares	Basic EPS	Provisional EPS	Diluted EPS
Basic EPS	\$292,000	80,000	\$3.65		
Preferred shares	<u>8,000</u>	<u>12,000</u>			
Provisional EPS	\$300,000	92,000		\$3.26	
Bonds	<u>8,400</u>	<u>6,000</u>			
Diluted earnings per share	<u>\$308,400</u>	<u>98,000</u>			<u>\$3.15</u>

P15-37. Suggested solution:

GPSC's basic and diluted EPS are both \$1.79 determined as follows. Note that publicly accountable enterprises with complex capital structures must report diluted EPS even if it is the same as basic EPS.				
Net income to ordinary shareholders				
Net income				\$9,000,000
Less: Dividends on cumulative preferred shares*		$\$1,000,000 \times 4\%$		<u>\$(40,000)</u>
				<u>\$8,960,000</u>
* The dividend entitlement on the cumulative preferred shares is deducted from net income irrespective of whether dividends are declared or how much is paid out during the year.				
Weighted average number of ordinary shares outstanding				
Weighted average number of ordinary shares outstanding (given)				<u>5,000,000</u>
Basic EPS	$\$8,960,000 / 5,000,000$			<u>\$1.79</u>
Incremental EPS / rank the dilutiveness of POS				
Potential ordinary shares	Income effect	Share effect	Incremental EPS	Rank order
Stock option A	\$0	$IS = N(1 - K/S) = 20,000(1 - \$14*/\$15) = 1,333$ (rounded)	\$0.00	1

Stock option B	\$0	$IS = N(1 - K/S) = 5,000(1 - \$13/\$15) = 667$ (rounded)	\$0.00	2	
Convertible preferred	$\$1,000,000 \times 4\% = \$40,000$	$(\$1,000,000 / \$100) \times 4 = 40,000$	$\$40,000 / 40,000 = \1.00	3	
Convertible bond	$(\$3,000,000 \times .05) \times (1 - 40\%) = \$90,000$	$\$3,000,000 / \$1,000 \times 16 = 48,000$	$\$90,000 / 48,000 = \1.88	4	
*When there are multiple conversion options the most dilutive alternative is used to calculate diluted EPS.					
IS = number of incremental shares to be issued; K = exercise price; N = number of shares that would have been issued for option exercise; S = average market price					
Sequentially compare the incremental EPS to the provisional EPS to determine diluted EPS					
	Income	Shares	Basic EPS	Provisional EPS	Diluted EPS
Basic EPS	\$8,960,000	5,000,000	\$1.79		
Stock option A	<u>0</u>	<u>1,333</u>			
Provisional EPS	\$8,960,000	5,001,333		\$1.79	
Stock option B	<u>0</u>	<u>667</u>			
Provisional EPS	\$8,960,000	5,002,000		\$1.79	
Preferreds	<u>40,000</u>	<u>40,000</u>			
Provisional EPS	\$9,000,000	5,042,000		\$1.79	
The convertible bond is antidilutive and ignored	<u>0</u>	<u>0</u>			
Diluted earnings per share	<u>\$9,000,000</u>	<u>5,042,000</u>			<u>\$1.79</u>

P15-38. Suggested solution:**a. Calculation of basic EPS**

Net income (loss)		(\$400,000)
Less: Preferred dividends "A"	$5,000 \times \$100 \times 5\%$	<u>(25,000)</u>
Net income available to ordinary shareholders		<u>(\$425,000)</u>
Basic EPS (loss per share)	$\$(425,000) / 50,000$	<u>(\$8.50)</u>

Supporting comment—The dividends on the series A preferreds are cumulative and accordingly are deducted from net income even though they were not declared.

- b. The incremental EPS of the convertible bond is \$1.75 as determined below. We do not need to compute this, however, as if there is a loss per share from continuing operations, basic and diluted EPS are equal as all potential ordinary shares are antidilutive.

Potential ordinary shares	Income effect	Share effect	Incremental EPS
Convertible bonds	$(\$500,000 \times .07) \times (1 - 25\%) = \$26,250$	$(\$500,000 / \$1,000) \times 30 = 15,000$	\$1.75

- c. Diluted EPS (loss per share) is the same as basic EPS (loss per share) - (\$8.50).

P15-39. Suggested solution:

Basic and diluted EPS (loss per share)	
- Continuing operations	$\$50,000 / 5,000 = (\$10.00)$
- Discontinued operations	$\$40,000 / 5,000 = \underline{\$8.00}$
- Operations	$\$(10,000) / 5,000 = \underline{\$(2.00)}$
Supporting comment —The dividends on the preferreds were not declared during the year. They have not been deducted from net income as they are non-cumulative in nature.	

The options would normally be dilutive as the strike price is less than the average market price - $[(\text{average market price} - \text{strike price}) / \text{average market price}] \times \text{number of options} = [(\$12.50 - \$10.00) / \$12.50] \times 10,000 = 2,000$ potential ordinary shares. Recall however, that when there is a loss per share from continuing operations, basic and diluted EPS are equal as all potential ordinary shares are antidilutive.

P15-40. Suggested solution:

Calculation of basic EPS (loss per share)		
Net income from continuing operations		\$50,000
Less: Preferred dividends	$2,000 \times \$100 \times 3\%$	<u>(6,000)</u>
Net income from continuing operations available to ordinary shareholders		\$44,000
Basic EPS (loss per share) from continuing operations	$\$44,000 / 5,000$	\$8.80
Basis EPS (loss per share) from discontinued operations	$\$(60,000) / 5,000$	<u>(12.00)</u>
Basic EPS (loss per share) from operations	$[\$44,000 + (\$60,000)] / 5,000$	<u>(\$3.20)</u>
Supporting comment —The dividends on the preferreds are cumulative in nature and accordingly are deducted from income from continuing operations even though they were not declared.		

The options are dilutive as the strike price is less than the average market price - [(average market price – strike price) / average market price] × number of options = [(\$18.00 – \$15.00) / \$18.00] × 6,000 = 1,000 potential ordinary shares. Recall that if basic EPS from continuing operations is positive but there is an overall net loss, diluted EPS from continuing operations is computed in the normal manner.

Calculation of diluted EPS (loss per share)		Basic
Net income from continuing operations		\$50,000
Less: Preferred dividends	2,000 × \$100 × 3%	<u>(6,000)</u>
Net income from continuing operations available to ordinary shareholders		\$44,000
Diluted EPS (loss per share) from continuing operations	\$44,000 / (5,000 + 1,000)	\$7.33
Diluted EPS (loss per share) from discontinued operations	(\$60,000) / (5,000 + 1,000)	<u>(10.00)</u>
Diluted EPS (loss per share) from operations	[\$44,000 + (\$60,000)] / (5,000 + 1,000)	<u>(\$2.67)</u>

P15-41. Suggested solution:

Kitchener's basic and diluted EPS are \$4.59 and \$4.37, respectively, determined as follows.

Net income to ordinary shareholders

Net income		\$800,000
Less: Preferred dividends "A"	10,000 × \$100 × 2%	<u>(20,000)</u>
		<u>\$ 780,000</u>

The dividends on the non-cumulative preferred shares are deducted from net income only if they are declared.

Weighted average number of ordinary shares outstanding

Date (2015)	Activity	Shares O/S	Adjustment factor	Fraction of year	WASO (OS × AF × fraction)
Jan. 1–Jan. 31	Opening balance	100,000	2.0	1/12	16,667
Feb. 1–Aug. 31	Repurchased 20,000 shares and held them as treasury*	80,000	2.0	7/12	93,333
Sept. 1–Oct. 31	Issued 10,000 shares from treasury*	90,000	2.0	2/12	30,000
Nov. 1–Dec. 31	2:1 stock split	180,000	1	2/12	<u>30,000</u>
Weighted average number of ordinary shares outstanding					<u>170,000</u>

*Treasury shares are issued but not *outstanding*; we are calculating the weighted average number of ordinary shares *outstanding*.

Basic EPS	\$780,000 / 170,000			<u>\$4.59</u>
Incremental EPS / rank the dilutiveness of POS				
Potential ordinary shares	Income effect	Share effect	Incremental EPS	Rank order
Convertible bonds B	$(\$1,000,000 \times .04) \times (1 - 20\%) = \$32,000$	$(\$1,000,000 / \$1,000) \times 11 = 11,000^*$	\$2.91	3
Convertible bonds C	$(\$800,000 \times .03) \times (1 - 20\%) = \$19,200$	$(\$800,000 / \$1,000) \times 9 = 7,200$	\$2.67	2
Convertible preferred shares	$10,000 \times \$100 \times 2\% = \$20,000$	$10,000 \times 1/2 = 5,000$	\$4.00	4
Stock option A	Exercise price (\$26.00) > average market price (\$17.00), therefore antidilutive		NA	anti-dilutive
Stock option B	\$0	$(S - K) / S \times N$ $= [(\$17 - \$15) / \$17] \times 15,000 = 1,765$ (rounded)	\$0.00	1
*When there are multiple conversion options the most dilutive alternative is used to calculate diluted EPS.				
Sequentially compare the incremental EPS to the provisional EPS to determine diluted EPS				
	Income	Shares	Basic EPS	Provisional EPS
Basic EPS	\$780,000	170,000	\$4.59	
Stock option B	<u>0</u>	<u>1,765</u>		
Provisional EPS	\$780,000	171,765		\$4.54
Bonds C	<u>19,200</u>	<u>7,200</u>		
Provisional EPS	\$799,200	178,965		\$4.47
Bonds B	<u>32,000</u>	<u>11,000</u>		
	\$831,200	189,965		\$4.38
Preferred shares	<u>20,000</u>	<u>5,000</u>		
	\$851,200	194,965		\$4.37
Stock option A is antidilutive and ignored	<u>0</u>	<u>0</u>		
Diluted earnings per share	<u>\$851,200</u>	<u>194,965</u>		<u>\$4.37</u>

P15-42. Suggested solution:

Complex's basic and diluted EPS are \$4.13 and \$3.82, respectively, determined as follows.

Net income to ordinary shareholders					
Net income					\$2,800,000
Less: Preferred dividends "A"			30,000 × \$2		(60,000)
Less: Preferred dividends "B"			50,000 × \$100 × 5%		<u>(250,000)</u>
					<u>\$2,490,000</u>
Weighted average number of ordinary shares outstanding					
Date (2014)	Activity	Shares O/S	Adjustment factor	Fraction of year	WASO (OS × AF × fraction)
Jan. 1–Feb 28	Opening balance*	200,000	3	2/12	100,000
Mar. 1–June 30	3:1 stock split	600,000	1	4/12	200,000
July 1–Aug. 31	Repurchased 20,000 shares and held them in treasury	580,000	1	2/12	96,667
Sept. 1–Sept. 30	Sold 10,000 shares from treasury	590,000	1	1/12	49,167
Oct. 1–Dec. 31	Sold 40,000 shares from treasury	630,000	1	3/12	<u>157,500</u>
Weighted average number of ordinary shares outstanding					<u>603,334</u>
*Use shares outstanding, not issued					
Basic EPS	\$2,490,000 / 603,334				<u>\$4.13</u>
Incremental EPS / rank the dilutiveness of POS					
Potential ordinary shares	Income effect	Share effect		Incremental EPS	Rank order
Convertible bonds A	$(\$2,000,000 \times .04) \times (1 - 35\%) = \$52,000$	$(\$2,000,000 / \$1,000) \times 5 = 10,000$		\$5.20	5
Convertible bonds B	$(\$1,000,000 \times .06) \times (1 - 35\%) = \$39,000$	$(\$1,000,000 / \$1,000) \times 8 = 8,000$		\$4.88	4
Convertible preferred shares A	$30,000 \times \$2.00 = \$60,000$	$30,000 \times 1 = 30,000$		\$2.00	2
Convertible preferred shares B	$50,000 \times \$100 \times 5\% = \$250,000$	$50,000 \times 2 = 100,000$		\$2.50	3
Employee stock option	Exercise price (\$11.00) > average market price (\$10.00), therefore antidilutive			NA	anti-dilutive
Warrants	\$0	$(S - K)/S \times N = [(\$10 - \$7)/\$10] \times 1,200 = 360$		\$0.00	1
*Dividends were not declared during the year on these non-cumulative shares.					

Sequentially compare the incremental EPS to the provisional EPS to determine diluted EPS					
	Income	Shares	Basic EPS	Provisional EPS	Diluted EPS
Basic EPS	\$2,490,000	603,334	\$4.13		
Warrants	<u>0</u>	<u>360</u>			
Provisional EPS	\$2,490,000	603,694		\$4.12	
Preferred A	<u>60,000</u>	<u>30,000</u>			
Provisional EPS	\$2,550,000	633,694		\$4.02	
Preferred B	<u>250,000</u>	<u>100,000</u>			
Provisional EPS	\$2,800,000	733,694		\$3.82	
Convertible bonds A and B and the employee stock options are antidilutive and ignored	<u>0</u>	<u>0</u>			
Diluted earnings per share	<u>\$2,800,000</u>	<u>733,694</u>			<u>\$3.82</u>

P15-43. Suggested solution:

Kingston's basic and diluted EPS are \$3.00 and \$2.58, respectively, determined as follows.					
Net income to ordinary shareholders					
Net income					\$1,339,000
Less: Preferred dividends "A"	100,000 × \$4.00				(400,000)
Less: Preferred dividends "B"	50,000 × \$100 × 3%				(150,000)
					<u>\$ 789,000</u>
Weighted average number of ordinary shares outstanding					
Date (2014)	Activity	Shares O/S	Adjustment factor	Fraction of year	WASO (OS × AF × fraction)
Jan. 1–Feb. 28	Opening balance	200,000	1.2	2/12	40,000
Mar. 1–Sept. 30	Issued 20,000 shares	220,000	1.2	7/12	154,000
Oct. 1–Nov. 30	Issued 10,000 shares	230,000	1.2	2/12	46,000
Dec. 1–Dec. 31	20% stock dividend	276,000	1	1/12	<u>23,000</u>
	Weighted average number of ordinary shares outstanding				<u>263,000</u>
Basic EPS	\$789,000 / 263,000				<u>\$3.00</u>

Incremental EPS / rank the dilutiveness of POS					
Potential ordinary shares	Income effect	Share effect	Incremental EPS	Rank order	
Convertible bonds B	$(\$2,000,000 \times .05) \times (1 - 30\%) = \$70,000$	$(\$2,000,000 / \$1,000) \times 10 = 20,000$	\$3.50	anti-dilutive	
Convertible bonds C	$(\$500,000 \times .03) \times (1 - 30\%) = \$10,500$	$(\$500,000 / \$1,000) \times 8 = 4,000$	\$2.63	3	
Convertible preferred shares	$50,000 \times \$100 \times 3\% = \$150,000$	$50,000 \times 2 = 100,000$	\$1.50	2	
Stock option A	Exercise price (\$20.00) > average market price (\$15.00), therefore antidilutive		NA	anti-dilutive	
Stock option B	\$0	$(S - K) / S \times N$ $= [(\$15 - \$12)/\$15] \times 5,000 = 1,000$	\$0.00	1	
Sequentially compare the incremental EPS to the provisional EPS to determine diluted EPS					
	Income	Shares	Basic EPS	Provisional EPS	Diluted EPS
Basic EPS	\$789,000	263,000	\$3.00		
Stock option B	<u>0</u>	<u>1,000</u>			
Provisional EPS	\$789,000	264,000		\$2.99	
Preferred shares	<u>150,000</u>	<u>100,000</u>			
Provisional EPS	\$939,000	364,000		\$2.58	
Both convertible bond issues and stock option A are antidilutive and ignored	<u>0</u>	<u>0</u>			
Diluted earnings per share	<u>\$939,000</u>	<u>364,000</u>			<u>\$2.58</u>

P15-44. Suggested solution:

Simple's basic and diluted EPS are \$6.42 and \$3.94, respectively, determined as follows.

Net income to ordinary shareholders					
Net income					<u>\$3,300,000</u>
The preferred shares are non-cumulative. Dividends were not declared in 2014.					
Weighted average number of ordinary shares outstanding					
Date (2014)	Activity	Shares O/S	Adjustment factor	Fraction of year	WASO (OS × AF × fraction)
Jan. 1–Feb 28	Opening balance*	250,000	2	2/12	83,333
Mar. 1–June 30	2:1 stock split	500,000	1	4/12	166,667
July 1–Aug. 31	Sold 20,000 shares	520,000	1	2/12	86,667
Sept. 1–Sept. 30	Repurchased 10,000 shares	510,000	1	1/12	42,500
Oct. 1–Dec. 31	Sold 30,000 shares	540,000	1	3/12	<u>135,000</u>
Weighted average number of ordinary shares outstanding					<u>514,167</u>
*Use shares outstanding, not issued					
Basic EPS \$3,300,000 / 514,167					<u>\$6.42</u>
Incremental EPS / rank the dilutiveness of POS					
Potential ordinary shares	Income effect	Share effect		Incremental EPS	Rank order
Convertible bonds A	$(\$1,000,000 \times .03) \times (1 - 25\%) = \$22,500$	$(\$1,000,000 / \$1,000) \times 7 = 7,000$		\$3.21	5
Convertible bonds B	$(\$2,000,000 \times .05) \times (1 - 25\%) = \$75,000$	$(\$2,000,000 / \$1,000) \times 6 = 12,000$		\$6.25	6
Convertible preferred shares A	\$0.00*	$10,000 \times 2 = 20,000$		\$0.00	2
Convertible preferred shares B	\$0.00*	$100,000 \times 3 = 300,000$		\$0.00	1
Employee stock option	\$0	$(S - K)/S \times N = [(\$12 - \$10)/\$12] \times 8,000 = 1,333$		\$0.00	4
Warrants	\$0	$(S - K)/S \times N = [(\$12 - \$8)/\$12] \times 5,000 = 1,667$		\$0.00	3
*Dividends were not declared during the year on these non-cumulative shares.					

Sequentially compare the incremental EPS to the provisional EPS to determine diluted EPS					
	Income	Shares	Basic EPS	Provisional EPS	Diluted EPS
Basic EPS	\$3,300,000	514,167	\$6.42		
Warrants	<u>0</u>	<u>1,667</u>			
Provisional EPS	\$3,300,000	515,834		\$6.40	
Employee stock options	<u>0</u>	<u>1,333</u>			
Provisional EPS	\$3,300,000	517,167		\$6.38	
Preferred B	<u>0</u>	<u>300,000</u>			
Provisional EPS	\$3,300,000	817,167		\$4.04	
Preferred A	<u>0</u>	<u>20,000</u>			
Provisional EPS	\$3,300,000	837,167		\$3.94*	
Bonds A	<u>22,500</u>	<u>7,000</u>			
Provisional EPS	\$3,322,500	844,167		\$3.94**	
Convertible bonds B are antidilutive and ignored	<u>0</u>	<u>0</u>			
Diluted earnings per share	<u>\$3,322,500</u>	<u>844,167</u>			<u>\$3.94</u>
*\$3.942					
**\$3.936					
While not readily evident due to rounding, Bonds A are dilutive in nature and are therefore included in the determination of diluted EPS.					

P15-45. Suggested solution:

- a. Preliminary—if the options are dilutive, then $[(\text{average market price} - \text{strike price}) / \text{average market price}] \times \text{number of options} = [(\$25 - \$20) / \$25] \times 10,000 = 2,000$ potential ordinary shares.

	Situation 1	Situation 2	Situation 3	Situation 4
Basic EPS				
- Continuing operations	\$500,000 / 100,000 = \$5.00	\$(500,000) / 100,000 = \$(5.00)	\$(50,000) / 100,000 = \$(0.50)	\$50,000 / 100,000 = \$0.50
- Discontinued operations	\$100,000 / 100,000 = \$1.00	\$100,000 / 100,000 = \$1.00	\$100,000 / 100,000 = \$1.00	\$(100,000) / 100,000 = \$(1.00)
- Operations	\$6.00	\$(4.00)	\$0.50	\$(0.50)
Diluted EPS				
Include options?	Yes	No [see b. below]	No [see b. below]	Yes [see c. below]
- Continuing operations	\$500,000 / 102,000 = \$4.90	\$(500,000) / 100,000 = \$(5.00)	\$(50,000) / 100,000 = \$(0.50)	\$50,000 / 102,000 = \$0.49
- Discontinued operations	\$100,000 / 102,000 = \$0.98	\$100,000 / 100,000 = \$1.00	\$100,000 / 100,000 = \$1.00	\$(100,000) / 102,000 = \$(0.98)
- Net income	\$5.88	\$(4.00)	\$0.50	\$(0.49)

- b. If there is a loss per share from continuing operations, basic and diluted EPS are equal as all potential ordinary shares are antidilutive.
- c. If basic EPS from continuing operations is positive but there is an overall net loss, diluted EPS from continuing operations is computed in the normal manner.
- d. The following EPS information should be presented on the face of the income statement or on the face of the single statement of comprehensive income:
- i) Basic EPS
 - ii) Diluted EPS if the company has any potential ordinary shares—even if it is the same as basic EPS
 - iii) Basic and diluted EPS arising from operations, continuing operations, and discontinued operations if the company has a profit or loss from discontinued operations. Alternatively, EPS from discontinued operations may be disclosed in the notes to the financial statements.

K. Mini-Cases

Case 1: XYZ Company. *Suggested solution:*

	2013	
	Ordinary shares	Net income
Basic earnings per share		
Earnings per income statement		\$2,500,000
Dividend requirement on preferred shares		<u>(50,000)</u>
Ordinary shares outstanding from beginning of year	450,000	
Ordinary shares issued on September 30, 2013 (100,000 shares × 3/12)	25,000	
Convertible bonds converted on June 30, 2013 (65 ordinary shares × 400 bonds × 6/12)	<u>13,000</u>	
	488,000	\$2,450,000
Basic earnings per share (\$2,450,000 / 488,000)		\$5.02
Diluted earnings per share		
Earnings applicable to ordinary shares	488,000	\$2,450,000
Effect of assumed exercise of options:		
Option A [(average market price – strike price) / average market price] × number of options = [(\$13 – \$11.50) / \$13] × 20,000 = 2,308 potential ordinary shares [Market price > exercise price therefore dilutive]	<u>2,308</u>	
Provisional EPS \$2,450,000 / 490,308 = \$5.00	490,308	2,450,000
Effect of assumed conversion of all 8% bonds (after income taxes):		
\$400,000 converted June 30, 2013	13,000	9,600
\$600,000 outstanding [Incremental EPS = (\$28,800 + \$9,600) / (13,000 + 39,000) = \$0.74; \$0.74 < \$5.00 therefore dilutive]	<u>39,000</u>	<u>28,800</u>
	<u>542,308</u>	<u>\$2,488,400</u>
Diluted earnings per share (\$2,488,400 / 542,308)		\$4.59

Case 2: Mom and Dot Reid Inc. *Suggested solution:*

To: Charlotte Ash, CEO
From: Gail Fisher, CFO
Re: Your proposals to increase EPS
Date: September 16, 2014

Further to our meeting of September 15, my thoughts and recommendations as to your proposals to increase EPS for the 2014 fiscal year are summarized below:

Overview

MDRI is a public company and as such is required to prepare its financial statements in accordance with IFRS. Moreover, as a CGA I am bound by the CGA's Code of Ethics. While your desire to increase EPS is understandable, your suggestions are questionable from a strategic perspective and are weak from an ethical point of view.

Analysis and recommendations

1. The proposed share buy-back would have minimal effect on MDRI's EPS for the year as shares issued and retired are normally weighted to reflect the transaction date. Net income would be reduced by the after-tax effect of the interest costs. Assuming that the buy-back took place on December 1, Basic EPS would increase by \$0.01 to \$3.26 as set out in Appendix I.

While share buy-backs are not an uncommon event, there is usually a compelling business reason to do so. Reasons include: to achieve a desired degree of financial leverage in the capital structure; to distribute cash excess to the company's planned needs by way of buy-back rather than a special dividend; the absence of favourable investment opportunities; and to offset the dilution of employee stock option plans.

You may have had discussions with the board of directors of which I am unaware. Having said this, the primary reason for the buy-back is to increase EPS, rather than to fulfill other strategic initiatives. I am challenged by this from an ethical perspective as I would expect that the board would fully participate in the decision to retire shares. Accordingly, I do not recommend that the share buy-back be undertaken.

2. Repurchasing the bonds and issuing new debt would produce an illusory after-tax gain of \$16.8 million, which would increase basic EPS by a further \$0.42 to \$3.68. This assumes that all the outstanding bonds could be repurchased on the open market for the current price. This supposition may not hold, though, as the bonds are not callable and many bondholders may not feel compelled to sell.

This gain excludes the impact of transaction costs on both the repurchase of the existing debt and sale of the new bonds. Notwithstanding the increase in EPS this year, I do not recommend the repurchase of the bonds as it is not in the company's best interests to do so and as I have severe reservations as to the ethical propriety of this transaction. The gain on redemption will be roughly offset by higher interest costs over the next three years. Hypothetically this is not a bad trade-off as the company will be revenue neutral over the three-year period as a result of this action. This

superficial analysis, though, fails to account for both transaction costs and the time value of money—the income taxes must be paid now while the reduction in taxes due to increased interest costs will occur over the next three years. Shareholder wealth will ultimately decrease as a result. Much like the share repurchase proposal, this initiative appears to be lacking from a strategic perspective as it is being undertaken solely to increase EPS.

3. While the proposed classification of this transaction would change the composition of basic EPS, it would not change the total as neither net income nor the weighted average number of ordinary shares is affected. Whether the sale of the plant represents the sale of a discontinued operation is ultimately a matter of professional judgment. IFRS 5 defines a discontinued operation as:

A component of an entity that either has been disposed of or is classified as held for sale and:

- (a) represents a separate major line of business or geographical area of operations,*
- (b) is part of a single co-ordinated plan to dispose of a separate major line of business or geographical area of operations or*
- (c) is a subsidiary acquired exclusively with a view to resale.*

As the plant was one of three in the same geographical area and produced a similar product to the other two, it does not appear that the loss can be legitimately classified as emanating from discontinued operations. As MDRI is a public company, presumably we will not choose an accounting policy that conflicts with IFRS. Accordingly, I do not recommend that the closure and sale be classified as arising from discontinued operations. The transaction may be reported as an unusual item on the income statement with supporting details provided in the notes to the financial statements, however. While this will not change the reported EPS it will alert investors as to the atypical nature of this loss.

4. Sale-leaseback transactions are usually undertaken when a company is facing cash flow difficulties or management makes a strategic decision to lease, rather than own, all its premises. Neither of these reasons would appear to apply to MDRI. As such, I am not sure why such a transaction would be contemplated as given the long-term irrevocable nature of the lease we are virtually guaranteeing an ongoing profit to the purchaser.

Also, the transaction will not affect EPS in 2014 as IAS 17 provides that the profit is deferred and amortized over the lease term. The proposed sale would close on December 31 and accordingly the impact on net income for the year would be negligible. I do not recommend that MDRI sell the plant as it is not in its best strategic interests to do so.

5. A reverse stock split would double the reported EPS to \$7.37. IFRS, though, requires that all comparable EPS figures be restated for the effect of stock splits and dividends. The governing standard permits investors to easily compare the EPS on a year-to-year basis with the effects of stock issuance and retirement that do not affect the investors' relative ownership interests removed. As such, while EPS would be higher for the year than if the reverse split does not occur,

the percentile increase or decrease over 2013's results will not change. Given the transparency of the reason for the increased EPS the stock price is not likely to be affected by this action.

From a practical perspective, the exercise price and number of shares eligible to be purchased for each option are automatically adjusted to account for stock splits and dividends. Accordingly, the amount to be realized from exercising the options will not be affected by this move.

From a strategic point of view, the company's shares are presently trading in the \$65.00 range. A reverse split would increase the price to about \$130.00. Very few stocks on the TSX trade above \$100.00 as it becomes too expensive for small investors to buy a standard board lot of 100 shares. An unintended side effect of a reverse stock split may be to reduce the liquidity of the shares and, in so doing, increase price volatility that ultimately decreases the price. Moreover, there are costs associated with a reverse stock split that may be avoided by simply maintaining the status quo.

I do not recommend that the reverse stock split be undertaken as there is no compelling reason to do so; it is very unlikely to increase share price; and it will result in expenses being incurred that could otherwise be avoided.

Conclusion

Basic EPS, currently projected at \$3.25 per share, can be increased to \$3.68 per share by undertaking the share repurchase and bond refinancing. While these actions may increase share price slightly in the short term, in the long term the share purchase may prove to be detrimental to the firm and the bond refinancing most certainly is. It is highly unlikely that the reverse share split will affect the share price as the underlying cause is very transparent and as IFRS requires all comparable EPS statistics to be restated to reflect the impact of the reverse split.

None of the initiatives appear to be sound from a strategic perspective, with the sole motivation seeming to be to increase EPS in the short term. As the CEO and employee of MDRI you have a duty to act in the best interests of all shareholders, rather than your self-interest. As such, the proposed transactions appear to be unethical and should not be undertaken.

Appendix I—Cumulative impact on EPS for the proposals			
	Earnings available to ordinary shareholders	Weighted average number of ordinary shares outstanding	Basic EPS
As currently projected for 2014	\$130,000,000	40,000,000	\$3.25
1 - Share repurchase – [$\$325,000,000 \times 5\% \times (1 - 30\%) \times (1/12)$] / [$5,000,000 \times (1/12)$]	<u>(947,917)</u>	<u>(416,667)</u>	
	\$129,052,083	39,583,333	\$3.26
2 - Bond refinance – $\$24,000,000 \times (1 - 30\%)$	<u>16,800,000</u>	<u>0</u>	

	\$145,852,083	39,583,333	\$3.68
3 - Sale of plant classified as discontinued operation	Not evaluated as appears to be contrary to IFRS 5		
4 - Sale and leaseback of plant	Will not affect 2014's EPS as per IAS 17		
5 - Reverse stock split – (39,583,333 / 2)	<u>\$145,852,083</u>	<u>19,791,666</u>	<u>\$7.37</u>

Case 3: Thomson Reuters Corporation. Suggested solution:

- Thomson Reuters Corporation has potential ordinary (common) shares in its capital structure. This can be quickly determined by looking at the Company's consolidated income statement, which reports both basic and diluted earnings per share. Companies that do not have potential ordinary (common) shares in their capital structure are not normally required to report diluted earnings per share.
- From perusal of note 11 on p. 99 of the annual report, you can determine that the only potential ordinary (common) shares in the Thomson Reuters Corporation arise from employee stock options and other incentive plans.
- Thomson Reuters Corporation's 2009 basic and diluted EPS appears to be the same as the dilutive effect of the potential ordinary (common) shares is minimal and due to rounding. Based on the information presented in note 11, as expected the 2009 basic EPS taken to four significant decimal places was \$1.0145 which is slightly higher than the diluted EPS of \$1.0109.

Case 4: EPS. Suggested solution:

To: Ms. Margaret D. Tale, CEO
 From: Sarina Felmeguchi, CFO
 Re: SPE's EPS for 2012
 Date: January 14, 2013

Please find my response to the comments you made with respect to SPE's 2012's earnings per share. I have answered your question in the same order as they were raised.

Comment 1

There are a number of reasons for the popularity of EPS with market participants, including:

- It communicates to shareholders how much of the company's profit is attributable to each ordinary (common) share they own. Thus, it helps them interpret the profitability of the company on a per share basis.
- EPS is a standardized measure with earnings stated on a per share basis. This assists investors in comparing the earnings of different firms irrespective of their size.
- This statistic helps investors in valuing companies. The price-to-earnings (PE) ratio is popular with investors for stock valuation. Since the PE ratio is determined by dividing the market price per share by the earnings per share, investors need EPS to calculate the PE ratio.

Comment 2

Basis EPS enumerates how much of the firm's earnings "belong" to each ordinary shareholder based on the average number of ordinary shares outstanding during the period. You are correct that diluted EPS is often viewed as a "worst case scenario". Another way to view diluted EPS, however, is that it provides shareholders and investors with an indicator of how much of the firm's current earnings would have "belonged" to them if all parties who were entitled to obtain ordinary shares on favourable terms did so. The idea is that potential ordinary shares (e.g., stock options that are in the money) are likely to eventually be converted into ordinary shares and, given the same level of earnings, EPS will reduce. Thus diluted EPS provides parties with a more realistic view of each ordinary share's "ownership" of reported earnings.

Comment 3

Yes, EPS is calculated using the weighted average number of shares outstanding during the year as the denominator. The use of the number of shares outstanding at year-end can obscure EPS as a measure of the company's performance as the number of shares outstanding can vary considerably during the year. The sale or repurchase of shares impacts on the company's resources available for investment, which in turn affects earnings. Consider, for example, a company that sells shares on the last day of the year. The equity issue increases the number of shares outstanding but given that the issue happened on the last day of the year, it is too late for the company's managers to invest the proceeds to generate additional profits. Hence EPS is lower than it would have been otherwise. The change has little to do with the company's performance during the period. To address this problem, the IASB requires that the average number of shares outstanding during the period be used to calculate EPS.

Comment 4

It is true that basic EPS can remain unchanged and diluted EPS can decrease notwithstanding an increase in reported earnings. To understand how this can occur, it is necessary to revisit how basic and diluted EPS are calculated.

Basic EPS = net income available to ordinary shareholders divided by the weighted average number of ordinary shares outstanding. Hence, there are three factors that affect basic EPS:

- Net income.
- Dividends on preferred shares.
- The weighted average number of ordinary shares outstanding.

Diluted EPS = the sum of net income available to ordinary shareholders and the income effect of dilutive potential ordinary shares divided by the sum of the weighted average number of shares outstanding and the share effect of dilutive potential ordinary shares. As such, there are two additional factors that affect diluted EPS:

- The income effect of dilutive potential ordinary shares.
- The share effect of dilutive potential ordinary shares.

If net income increases and basic EPS remained unchanged it means that the dividends on the preferred shares increased and/or the weighted average number of shares outstanding increased.

If net income increases and diluted EPS decreases, it means that the denominator increased at a faster rate than did the numerator. There are a number of reasons that this can happen, including:

- Additional ordinary shares were issued during the year.
- Preferred shares were issued during the year.
- Non-cumulative preferred shares were outstanding both years; however, dividends were declared this year while they were either not declared or declared in a lesser amount last year.
- Potential ordinary shares that were anti-dilutive last year are dilutive this year. For example, the firm's average stock price was lower than the exercise price of its stock options last year, but is higher than the exercise price this year.

I will be pleased to discuss the foregoing with you at your convenience.