

22.1 Analyze and evaluate alternative measures of financial performance.

1) Many common performance measures rely on internal financial and accounting information.

Answer: TRUE

Diff: 1 Type: TF

Skill: Remember

Objective: LO 22-1

2) Some companies present financial and non-financial performance measures for various organization units in a single report called the financial performance scorecard.

Answer: FALSE

Explanation: balanced scorecard

Diff: 2 Type: TF

Skill: Remember

Objective: LO 22-1

3) In establishing performance measures and compensation policy, the issues are interdependent and the decision maker may proceed through a series of decisions several times before selecting the performance measure(s).

Answer: TRUE

Diff: 2 Type: TF

Skill: Remember

Objective: LO 22-1

4) ROI, residual income, and economic value-added, can be used as performance measures.

Answer: TRUE

Diff: 1 Type: TF

Skill: Remember

Objective: LO 22-1

5) There are three basic ingredients in profitability: investment, revenue, and debt.

Answer: FALSE

Explanation: investment, revenue, costs

Diff: 2 Type: TF

Skill: Remember

Objective: LO 22-1

6) Return on investment highlights the benefits that managers can obtain by reducing their investments in current or fixed assets.

Answer: TRUE

Explanation: Some firms use total assets in the denominator; others use total assets minus current liabilities.

Diff: 2 Type: TF

Skill: Remember

Objective: LO 22-1

7) Imputed costs are costs recognized in particular situations that are not regularly recognized by accrual accounting procedures.

Answer: TRUE

Diff: 2 Type: TF

Skill: Remember

Objective: LO 22-1

8) The imputed cost of an investment is the required rate of return times the investment.

Answer: TRUE

Diff: 2 Type: TF

Skill: Remember

Objective: LO 22-1

9) Residual income is income plus an imputed interest charge for the investment.

Answer: FALSE

Explanation: "minus" the imputed interest charge

Diff: 1 Type: TF

Skill: Remember

Objective: LO 22-1

10) Economic value added is after-tax operating income minus (required rate of return times total assets).

Answer: FALSE

Explanation: ...minus (w/a cost of capital  $\times$  (total assets - current liabilities))

Diff: 3 Type: TF

Skill: Remember

Objective: LO 22-1

11) The first step in designing accounting based performance measures is to choose performance measures that align with top management's financial goals.

Answer: TRUE

Diff: 1 Type: TF

Skill: Remember

Objective: LO 22-1

12) Return on investment is also called the accrual accounting rate of return.

Answer: TRUE

Diff: 1 Type: TF

Skill: Remember

Objective: LO 22-1

13) Investment turnover is calculated by dividing investment by revenues.

Answer: FALSE

Explanation: Investment turnover is calculated by dividing revenues by investment.

Diff: 2 Type: TF

Skill: Remember

Objective: LO 22-1

14) Return on sales is calculated by dividing net income by revenues.

Answer: TRUE

Diff: 1 Type: TF

Skill: Remember

Objective: LO 22-1

15) The three alternatives for increasing return on investment include increasing assets such as receivables, increasing revenues, and decreasing costs. (In all cases assume that all other items stay the same.)

Answer: FALSE

Explanation: Increasing receivables does not increase return on investment.

Diff: 2 Type: TF

Skill: Understand

Objective: LO 22-1

16) Most Canadian and U.S. companies use the Sarbanes-Oxley Act (SOX) as a framework for evaluating their internal control.

Answer: FALSE

Explanation: Use the new internal control framework issued in 2013 by COSO (Committee on Sponsoring Organizations of the Treadway Commission).

Diff: 2 Type: TF

Skill: Remember

Objective: LO 22-1

17) Pay for performance measures in the best interests of shareholders would, logically, exclude long-term achievement and deferred compensation.

Answer: FALSE

Explanation: "include"

Diff: 2 Type: TF

18) A report that measures financial and nonfinancial performance measures for various organization units in a single report is called a (n)

A) balanced scorecard.

B) financial report scorecard.

C) imbalanced scorecard.

D) unbalanced scorecard.

E) non-financial scorecard.

Answer: A

Diff: 1 Type: MC

Skill: Remember

Objective: LO 22-1

19) Which of the following is the LEAST typical balanced scorecard measure?

- A) customer satisfaction measures.
- B) direct materials measures.
- C) innovation measures.
- D) time measures.
- E) profitability measures.

Answer: B

Diff: 2 Type: MC

Skill: Understand

Objective: LO 22-1

20) What the first step in selecting appropriate performance measures?

- A) Decide on the level of relevance and urgency of feedback.
- B) Decide on measurement alternatives for each performance measure.
- C) Decide on components n each performance measure.
- D) Decide on criteria targets against which to measure performance.
- E) Identify and align accounting performance measures with financial goals.

Answer: E

Diff: 2 Type: MC

Skill: Remember

Objective: LO 22-1

21) Deciding if all subunits should have the same required rate of return is an example of

- A) deciding on the level of relevance and urgency of feedback.
- B) deciding on measurement alternatives for each performance measure.
- C) deciding on components n each performance measure.
- D) deciding on criteria targets against which to measure performance.
- E) identifying and aligning accounting performance measures with financial goals.

Answer: D

Diff: 2 Type: MC

Skill: Understand

Objective: LO 22-1

22) Which of the following approaches include investment in the performance measure?

- A) ROI and RI
- B) ROI and ROS
- C) ROS and RI
- D) EVA and ROI
- E) ROI, EVA, and RI

Answer: E

Diff: 2 Type: MC

Skill: Understand

Objective: LO 22-1

23) Which of the following incorporates the amount of investment into the performance measure?

- A) dividend income
- B) residual income
- C) return on investment
- D) both residual income and return on investment
- E) both dividend income and residual

Answer: D

Diff: 2 Type: MC

Skill: Understand

Objective: LO 22-1

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

Berger Publishing has two divisions which operate autonomously. Their results for the past year were as follows:

	<u>Toronto</u>	<u>Vancouver</u>
Sales	\$5,000,000	\$6,000,000
Contribution margin	2,500,000	3,000,000
Operating income	2,000,000	3,500,000
Investment base (total assets)	6,500,000	7,500,000

The company's desired rate of return is 15%.

24) What are the respective return on investment ratios for the Toronto and Vancouver divisions?

- A) 0.04; 0.58
- B) 0.31; 0.47
- C) 0.38; 0.40
- D) 0.77; 1.25
- E) 0.38; 0.45

Answer: B

Explanation: B) Toronto:  $2,000,000 / 6,500,000 = 0.31$

Vancouver:  $3,500,000 / 7,500,000 = 0.47$

Diff: 1 Type: MC

Skill: Apply

Objective: LO 22-1

25) What are the respective residual incomes for the Toronto and Vancouver divisions?

- A) \$975,000; \$1,125,000
- B) \$1,025,000; \$1,125,000
- C) \$1,025,000; \$2,375,000
- D) \$2,375,000; \$1,025,000
- E) \$1,075,000; \$1,125,000

Answer: C

Explanation: C)	<u>Toronto</u>	<u>Vancouver</u>
Investment base	\$6,500,000	\$7,500,000
Minimum rate	$\times 0.15 \times 0.15$	
Minimum return	<u>\$975,000</u>	<u>\$1,125,000</u>

Income	\$2,000,000	\$3,500,000
Minimum return	975,000	1,125,000
Residual Income	<u>\$1,025,000</u>	<u>\$2,375,000</u>

Diff: 2 Type: MC

Skill: Apply

Objective: LO 22-1

26) Which of the following is TRUE concerning the ROI performance measure?

- A) ROI is based on cash flow.
- B) Is also called the accounting rate of return.
- C) Some companies use net assets (assets minus liabilities) as the numerator.
- D) The usual formulation is [total assets/ income ].
- E) Net assets are sometimes used as the denominator, and net assets are sometimes used as the numerator.

Answer: B

Diff: 2 Type: MC

Skill: Understand

Objective: LO 22-1

27) During the past year Badger Company had a net income of \$175,000. What is the ROI if the investment is \$25,000?

- A) 0.142
- B) 2.500
- C) 5.140
- D) 7.000
- E) 5.450

Answer: D

Explanation: D)  $\$175,000 / \$25,000 = 7$

Diff: 1 Type: MC

Skill: Apply

Objective: LO 22-1

- 28) The most popular approach to incorporating the investment base into a performance measure is
- A) income on return.
  - B) opportunity cost.
  - C) return on investment.
  - D) residual income.
  - E) economic value added.

Answer: C

Diff: 1 Type: MC

Skill: Remember

Objective: LO 22-1

- 29) Paymaster Company provided the following information for the year just ended.

Revenue	\$200,000
Operating assets	70,000
Net operating income	110,000
Total assets	104,500

What is the return on investment?

- A) 2.25
- B) 1.57
- C) 1.05
- D) 0.59
- E) 0.55

Answer: C

Explanation: C)  $\$110,000 / \$104,500 = 1.05$

Diff: 1 Type: MC

Skill: Apply

Objective: LO 22-1

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

Thacker Company has two regional offices. The information for each is as follows:

	<u>Edmonton</u>	<u>Sarnia</u>
Revenues	\$290,000	\$298,000
Total assets	\$2,900,000	\$4,500,000
Net operating income	\$600,000	\$1,200,000

30) What is the Edmonton Division's return on investment?

- A) 0.21
- B) 0.27
- C) 0.48
- D) 2.06
- E) 0.25

Answer: A

Explanation: A)  $\$600,000 / \$2,900,000 = 0.21$

Diff: 1 Type: MC

Skill: Apply

Objective: LO 22-1

31) What is the return on investment for the Sarnia division?

- A) 0.21
- B) 0.27
- C) 0.48
- D) 2.06
- E) 0.25

Answer: B

Explanation: B)  $\$1,200,000 / \$4,500,000 = 0.27$

Diff: 1 Type: MC

Skill: Apply

Objective: LO 22-1

32) Keeping all other factors constant, which of the following would NOT cause an increase in the return on investment?

- A) actions that increase revenues
- B) actions that increase liabilities
- C) actions that decrease investments
- D) actions that decrease expense
- E) actions that increase sales

Answer: B

Diff: 2 Type: MC

Skill: Understand

Objective: LO 22-1



33) An automotive dealership, with a book value of \$3,000,000, and total assets of \$5,000,000, has a long history of earning 18%. Last year, the company earned \$900,000. The owner is considering acquiring another dealership in a nearby town. If the expansion increases income by 50%, what is the maximum amount of investment the owner can make in the new dealership in order to maintain his desired 18% return?

- A) \$1,350,000
- B) \$9,000,000
- C) \$5,000,000
- D) \$3,000,000
- E) \$2,500,000

Answer: E

Explanation: E)  $\$450,000/\text{investment} = .18$

$(.18) \times \text{investment} = \$450,000$

$\text{investment} = \$450,000/.18$

$\text{investment} = \$2,500,000$

Diff: 3 Type: MC

Skill: Analyze

Objective: LO 22-1

34) The DuPont method of profitability analysis is

- A)  $\text{TA} - \text{CL}/\text{operating income}$
- B)  $\text{ROI} \times \text{WACC}$
- C)  $[\text{revenue}/\text{investment}] \times [\text{income}/\text{revenue}]$
- D)  $\text{ROI}/\text{WACC}$
- E)  $\text{ROI} \times \text{RI}$

Answer: C

Diff: 2 Type: MC

Skill: Remember

Objective: LO 22-1

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

The top management at Munchie Company, a manufacturer of computer games, is attempting to recover from a flood, which destroyed some of its accounting records. The main computer system was also severely damaged. The following information was salvaged:

	Alpha Division	Beta Division	Gamma Division
Sales	\$2,500,000	(a)	\$1,150,000
Net operating income	\$1,500,000	\$650,000	\$575,000
Total assets	(b)	(c)	\$766,667
Return on investment	0.25	0.15	(d)
Return on sales	(e)	0.10	0.5
Investment turnover	(f)	(g)	1.5

35) What is the value of the total assets belonging to the Alpha Division?

- A) \$4,333,333
- B) \$6,000,000
- C) \$6,500,000
- D) \$7,151,800
- E) \$6,434,434

Answer: B

Explanation: B)  $\$1,500,000 / .25 = \$6,000,000$

Diff: 2 Type: MC

Skill: Apply

Objective: LO 22-1

36) What is the value of the total assets belonging to the Beta Division?

- A) \$4,333,333
- B) \$5,952,380
- C) \$6,500,000
- D) \$7,151,800
- E) \$4,654,252

Answer: A

Explanation: A)  $1.5 = \$6,500,000 / X$

$X = \$4,333,333$

Diff: 2 Type: MC

Skill: Apply

Objective: LO 22-1

37) What is the Alpha Division's return on sales?

- A) 0.25
- B) 0.42
- C) 0.60
- D) 0.75
- E) 0.80

Answer: C

Explanation: C)  $\$1,500,000/\$2,500,000 = 0.60$

Diff: 2 Type: MC

Skill: Apply

Objective: LO 22-1

38) What were the sales for Beta Division?

- A) \$4,333,333
- B) \$5,952,380
- C) \$6,500,000
- D) \$7,151,800
- E) \$6,326,787

Answer: C

Explanation: C)  $0.10 = \$650,000/X$

$X = \$6,500,000$

Diff: 2 Type: MC

Skill: Apply

Objective: LO 22-1

39) What is the Gamma Division's return on investment?

- A) 0.25
- B) 0.42
- C) 0.60
- D) 0.75
- E) 0.80

Answer: D

Explanation: D)  $0.5 \times 1.5 = 0.75$

or  $\$575,000/\$766,667 = 0.75$

Diff: 2 Type: MC

Skill: Apply

Objective: LO 22-1

40) What is the Alpha Division's investment turnover?

- A) .50
- B) 1.0
- C) 2.4
- D) 3.5
- E) 0.42

Answer: E

Explanation: E) Investment Turnover = Sales/Assets

step 1 is to calculate the Assets

$ROI = \text{Net Income} / \text{Assets}$

$\text{Assets} = \text{net Income} / ROI$

$\text{Assets} = \$1,500,000 / 0.25 = \$6,000,000$

Then Investment Turnover =  $\$2,500,000 / \$6,000,000 = 0.42$

Diff: 3 Type: MC

Skill: Analyze

Objective: LO 22-1

41) What is the Beta Division's investment turnover?

- A) .50
- B) 0.75
- C) 0.67
- D) 2.5
- E) 1.5

Answer: E

Explanation: E) Return on Investment = Return on Sales × Investment Turnover

Investment Turnover = Return on Investment/Return on Sales

$= .15 / .10 = .833$

Diff: 3 Type: MC

Skill: Apply

Objective: LO 22-1

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

The top management at Groundsource Company, a manufacturer of lawn and garden equipment, is attempting to recover from a flood, which destroyed some of its accounting records. The main computer system was also severely damaged. The following information was salvaged:

	Tractor Division	Tiller Division	Digger Division
Sales	\$10,000,000	(a)	\$2,400,000
Net operating income	\$1,000,000	\$1,440,000	\$600,000
Total assets	(b)	(c)	\$2,000,000
Return on investment	0.20	0.10	(d)
Return on sales	(e)	0.12	0.25
Investment turnover	(f)	(g)	1.2

42) What were the sales for the Tiller Division?

- A) \$9,600,000
- B) \$12,000,000
- C) \$15,000,000
- D) \$15,500,000
- E) \$14,400,000

Answer: B

Explanation: B) Return on Sales = Net Inc/Sales

$$.12 = \$1,440,000/S$$

$$S = \$1,440,000/.12 = \$12,000,000$$

Diff: 2 Type: MC

Skill: Apply

Objective: LO 22-1

43) What is the value of the total assets belonging to the Tractor Division?

- A) \$ 3,500,000
- B) \$4,000,000
- C) \$4,500,000
- D) \$5,000,000
- E) \$2,000,000

Answer: D

Explanation: D) ROI = Net Income/Assets

$$\text{Assets} = \text{net Income}/\text{ROI}$$

$$\text{Assets} = \$1,000,000/0.20 = \$5,000,000$$

Diff: 2 Type: MC

Skill: Apply

Objective: LO 22-1

44) What is the value of the total assets belonging to the Tiller Division?

- A) \$10,000,000
- B) \$ 12,000,000
- C) \$ 14,400,000
- D) \$ 15,000,000
- E) \$ 16,000,000

Answer: C

Explanation: C)  $ROI = \text{Net Income} / \text{Assets}$

$\text{Assets} = \text{Net Income} / ROI$

$\text{Assets} = \$1,440,000 / 0.10 = \$14,400,000$

Diff: 2 Type: MC

Skill: Apply

Objective: LO 22-1

45) What is the Digger Division's return on investment?

- A) .25
- B) .30
- C) .45
- D) .60
- E) .20

Answer: B

Explanation: B)  $ROI = \text{Net Income} / \text{Net Assets} = \text{Return on Sales} \times \text{Asset Turnover}$

$0.25 \times 1.2 = .30$

Can verify by dividing Net Income/Assets

$= \$600,000 / \$2,000,000 = .30$

D)

Diff: 2 Type: MC

Skill: Apply

Objective: LO 22-1

46) What is the Tractor Division's return on sales?

- A) 0.10
- B) 0.12
- C) 0.15
- D) 0.20
- E) 0.25

Answer: A

Explanation: A)  $\$1,000,000 / \$10,000,000 = 0.10$

Diff: 1 Type: MC

Skill: Apply

Objective: LO 22-1

47) What is the Tractor Division's investment turnover?

- A) .50
- B) 1.0
- C) 2.0
- D) 2.5
- E) 3.0

Answer: C

Explanation: C) Investment Turnover = Sales/Assets

step 1 is to calculate the Assets

$ROI = \text{Net Income} / \text{Assets}$

$\text{Assets} = \text{net Income} / ROI$

$\text{Assets} = \$1,000,000 / 0.20 = \$5,000,000$

Then Investment Turnover =  $\$10,000,000 / \$5,000,000 = 2.0$

Diff: 3 Type: MC

Skill: Analyze

Objective: LO 22-1

48) What is the Tiller Division's investment turnover?

- A) .50
- B) 1.333
- C) 1.2
- D) 1.5
- E) .833

Answer: E

Explanation: E) Return on Investment = Return on Sales  $\times$  Investment Turnover

Investment Turnover = Return on Investment/Return on Sales

$= .10 / .12 = .833$

Diff: 3 Type: MC

Skill: Apply

Objective: LO 22-1

49) The cost of capital that is recognized in a residual income calculation is also call the

- A) opportunity cost.
- B) imputed cost.
- C) cash accounting cost.
- D) incremental cost.
- E) operating income cost.

Answer: B

Diff: 2 Type: MC

Skill: Remember

Objective: LO 22-1

50) A corporation has a required rate of return of 13% for all subsidiaries. The Calgary subsidiary earned residual income of \$200,000 in year 1, and \$300,000 in year 2 on an investment base of \$4,500,000. What rate of return did the Calgary subsidiary earn in years 1 and 2 respectively?

- A) 17.4% and 19.7%
- B) 4.4% and 6.7%
- C) 13.0% and 13.0%
- D) 7.9% and 10.9%
- E) 10.00% and 13.00%

Answer: A

Explanation: A) Year 1:

$$\text{OI} - (0.13 \times \$4,500,000) = \$200,000$$

$$\text{OI} = \$785,000$$

$$\text{ROI} = (\$785,000 / \$4,500,000) = 17.4\%$$

Year 2:

$$\text{OI} - (0.13 \times \$4,500,000) = \$300,000$$

$$\text{OI} = \$885,000$$

$$\text{ROI} = (\$885,000 / \$4,500,000) = 19.7\%$$

Diff: 3 Type: MC

Skill: Analyze

Objective: LO 22-1

51) What disadvantage is there in using ROI and/or RI as performance measures?

- A) A manager's bonus will decrease when ROI decreases.
- B) ROI may decrease when business expands if income does not increase in line with the new investment.
- C) RI and ROI are both single-period measures.
- D) RI is measured in absolute dollars but ROI is in percentages.
- E) Imputed costs that are deducted in the RI calculation, are not recognized in accrual accounting, and are therefore not included in the operating figure used in calculating ROI.

Answer: C

Diff: 2 Type: MC

Skill: Understand

Objective: LO 22-1

52) A company has total assets of \$500,000, a required rate of return of 10%, and operating income for the year was \$200,000. What is the residual income?

- A) \$150,000
- B) \$200,000
- C) \$250,000
- D) \$480,000
- E) \$175,000

Answer: A

$$\text{Explanation: A) } \$200,000 - (\$500,000 \times 0.10) = \$150,000$$

Diff: 1 Type: MC

Skill: Understand

Objective: LO 22-1



53) Which of the following performance measures is more likely to promote goal congruence?

- A) inventory turnover
- B) marginal income
- C) residual income
- D) return on investment
- E) contribution margin

Answer: C

Diff: 2 Type: MC

Skill: Understand

Objective: LO 22-1

54) The Auto Division of Fran Corporation has \$2.5 million in total assets and \$200,000 in liabilities, while the Transportation Division has \$5 million in total assets and \$3 million in liabilities. What are the imputed costs of the Auto division and of the Transportation division, respectively, if the corporation has a required rate of return of 11%?

- A) \$275,000 and \$550,000
- B) \$253,000 and \$330,000
- C) \$297,000 and \$880,000
- D) \$275,000 and \$330,000
- E) \$200,000 and \$3,000,000

Answer: A

Explanation: A)  $11\% \times \$2,500,000 = \$275,000$

$11\% \times \$5,000,000 = \$550,000$

Diff: 2 Type: MC

Skill: Apply

Objective: LO 22-1

55) Miller Medical Services provided the following information for its operations in the Hospital Bed Division.

Revenues	\$2,000,000
Accounts receivable	500,000
Required rate of return	11%
Operating assets	1,500,000
Net operating income	800,000
Taxable income	520,000
Total assets	\$6,500,000

What is the Hospital Bed's residual income?

- A) \$30,000
- B) \$85,000
- C) <\$195,000>
- D) \$1,285,000
- E) <\$250,000>

Answer: B

Explanation: B)  $\$800,000 - (\$6,500,000 \times .11) = \$85,000$

Diff: 2 Type: MC

Skill: Apply

Objective: LO 22-1

56) Which of the following is NOT a reason for evaluating subunits over a multi-year time horizon?

- A) Benefits of actions taken in the current period may not show up in a short-term performance measure.
- B) Managers may curtail R & D or plant maintenance in order to increase short-term results.
- C) Investments may actually decrease ROI and or RI in the short-term.
- D) The NPV of the cash flows over the life of an investment equals [total assets ÷ ROI].
- E) Investments may actually decrease ROI and or RI in the short-term, and benefits of actions taken in the current period may not show up in a short-term performance measure.

Answer: D

Diff: 2 Type: MC

Skill: Understand

Objective: LO 22-1

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

Brandorf Company has two sources of funds: long term debt with a market and book value of \$9 million issued at an interest rate of 10 percent; and, equity capital that has a market value of \$6 million (book value of \$2 million). The cost of equity capital is 5 percent, while the tax rate is 30 percent. Brandorf Company has profit centres in the following locations with the following data:

	Before-tax Operating Income	Total Assets	Current Liabilities
Ottawa	\$480,000	\$2,000,000	\$100,000
St. Johns	\$600,000	\$4,000,000	\$300,000
Regina	\$1,020,000	\$6,000,000	\$600,000

57) What is EVA for Ottawa?

- A) \$218,200
- B) \$362,200
- C) \$163,200
- D) \$480,000
- E) \$140,000

Answer: A

Explanation: A) After tax cost of debt = 7%

WACC =  $[9/15 \times 7\%] + [6/15 \times 5\%] = 6.2\%$

Ottawa (EVA) =  $(\$480,000 \times 0.7) - [0.062 \times (2,000,000 - \$100,000)] = \$218,200$

Diff: 3 Type: MC

Skill: Apply

Objective: LO 22-1

58) What is EVA for St. Johns?

- A) \$142,200
- B) \$190,600
- C) \$310,600
- D) \$200,000
- E) \$145,000

Answer: B

Explanation: B) After tax cost of debt = 7%

WACC =  $[9/15 \times 7\%] + [6/15 \times 5\%] = 6.2\%$

St. Johns (EVA) =  $(\$600,000 \times 0.7) - [0.062 \times (\$4,000,000 - \$300,000)] = \$190,600$

Diff: 3 Type: MC

Skill: Apply

Objective: LO 22-1

59) What is EVA for Regina?

- A) \$685,200
- B) \$342,000
- C) \$379,200
- D) \$648,000
- E) \$218,200

Answer: C

Explanation: C) After tax cost of debt = 7%

$$\text{WACC} = [9/15 * 7\%] + [6/15 * 5\%] = 6.2\%$$

$$\text{Regina (EVA)} = (\$1,020,000 \times 0.7) - [0.062 \times (\$6000,000 - \$600,000)] = \$714,000 - \$334,800 = \$379,200$$

Diff: 3 Type: MC

Skill: Apply

Objective: LO 22-1

60) A company's weighted-average cost of capital [WACC] was 9.6% last year. The company has \$6,000,000 of bonds payable (its only debt) with a 9.25% coupon, and has \$9,000,000 in equity capital. The tax rate is 35%. What is the company's cost of debt funding?

- A) 6.01%
- B) 6.25%
- C) 6.50%
- D) 9.25%
- E) 12.00%

Answer: A

$$\text{Explanation: A) } 0.0925 \times (1 - .35) = .06$$

Diff: 2 Type: MC

Skill: Analyze

Objective: LO 22-1

61) A company's weighted-average cost of capital [WACC] was 9.6% last year. The company has \$6,000,000 of bonds payable (its only debt) with a 9.25% coupon, and has \$9,000,000 in equity capital. The tax rate is 35%. What is the company's cost of equity capital?

- A) 6.00%
- B) 6.25%
- C) 6.50%
- D) 9.25%
- E) 12.00%

Answer: E

$$\text{Explanation: E) WACC} = [(.06 \times \$6,000,000) + (Y \times \$9,000,000)]/\$15,000,000 = .096$$

$$360,000 + (Y \times \$9,000,000) = 1,440,000$$

$$Y \times \$9,000,000 = 1,080,000$$

$$Y = 1,080,000/9,000,000$$

$$Y = .12$$

Diff: 3 Type: MC

Skill: Analyze

Objective: LO 22-1

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

Springfield Corporation, whose tax rate is 40%, has two sources of funds: long-term debt with a market value of \$8,000,000 and an interest rate of 8%, and equity capital with a market value of \$12,000,000 and a cost of equity of 12%. Springfield has two operating divisions, the Blue division and the Gold division, with the following financial measures for the current year:

	Total Assets	Current Liabilities	Operating Income
Blue Div.	\$9,500,000	\$2,800,000	\$1,055,000
Gold Div.	\$11,000,000	\$2,200,000	\$1,200,000

62) What is Economic Value Added (EVA®) for the Blue Division?

- A) -\$233,400
- B) \$21,960
- C) \$188,600
- D) \$433,960
- E) -\$63,800

Answer: B

Explanation: B) After tax cost of debt =  $60\% \times 8\% = 4.8\%$

WACC =  $[8/20 \times 4.8\%] + [12/20 \times 12\%] = 1.92\% + 7.2\% = 9.12\%$

EVA =  $(\$1,055,000 \times (1 - .4)) - ((\$9,500,000 - \$2,800,000) \times .0912) = \$21,960$

Diff: 3 Type: MC

Skill: Apply

Objective: LO 22-1

63) What is Economic Value Added (EVA®) for the Gold Division?

- A) -\$283,200
- B) -\$82,560
- C) \$196,800
- D) \$397,440
- E) -\$195,200

Answer: B

Explanation: B) After tax cost of debt =  $60\% \times 8\% = 4.8\%$

WACC =  $[8/20 \times 4.8\%] + [12/20 \times 12\%] = 1.92\% + 7.2\% = 9.12\%$

EVA =  $(\$1,200,000 \times (1 - .4)) - ((\$11,000,000 - \$2,200,000) \times .0912) = \$720,000 - \$82,560 = -\$82,560$

Diff: 3 Type: MC

Skill: Apply

Objective: LO 22-1

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

Coldbrook Company has two sources of funds: long-term debt with a market and book value of \$15 million issued at an interest rate of 10%, and equity capital that has a market value of \$9 million (book value of \$5 million). Coldbrook Company has profit centres in the following locations with the following operating incomes, total assets, and current liabilities. The cost of equity capital is 15%, while the tax rate is 30%.

	Operating Income	Assets	Current Liabilities
Bish Bash Falls	\$815,000	\$3,750,000	\$800,000
Brooksville	\$1,100,000	\$5,000,000	\$1,200,000
Stonybrook	\$2,450,000	\$9,250,000	\$3,180,000

64) What is the EVA<sup>®</sup> for Bish Bash Falls?

- A) \$338,563
- B) \$305,000
- C) \$275,500
- D) \$255,500
- E) \$220,188

Answer: C

Explanation: C)  $WACC = [(.10 \times (1 - .30) \times \$15,000,000) + (0.15 \times \$9,000,000)] / \$24,000,000 = 0.100$

Bish Bash Falls (EVA<sup>®</sup>) =  $(\$815,000 \times (1 - .30)) - [0.100 \times (\$3,750,000 - \$800,000)] = \$570,500 - \$295,000 = \$275,500$

Diff: 3 Type: MC

Skill: Apply

Objective: LO 22-1

65) What is the EVA<sup>®</sup> for Brooksville?

- A) \$476,250
- B) \$428,000
- C) \$415,525
- D) \$390,000
- E) \$318,750

Answer: D

Explanation: D)  $WACC = [(.10 \times (1 - .30) \times \$15,000,000) + (0.15 \times \$9,000,000)] / \$24,000,000 = 0.100$

Brooksville (EVA<sup>®</sup>) =  $(\$1,100,000 \times (1 - .30)) - [0.100 \times (\$5,000,000 - \$1,200,000)] = \$770,000 - \$380,000 = \$390,000$

Diff: 3 Type: MC

Skill: Apply

Objective: LO 22-1

66) What is the EVA<sup>®</sup> for Stonybrook?

- A) \$1,108,000
- B) \$1,168,700
- C) \$1,315,063
- D) \$1,403,063
- E) \$994,188

Answer: A

Explanation: A)  $WACC = [(.10 \times (1 - .30) \times \$15,000,000) + (0.15 \times \$9,000,000)] / \$24,000,000 = 0.100$

Stonybrook (EVA<sup>®</sup>) =  $(\$2,450,000 \times (1 - .30)) - [0.100 \times (\$9,250,000 - \$3,180,000)] = \$1,715,000 - \$607,000 = \$1,108,000$

Diff: 3 Type: MC

Skill: Apply

Objective: LO 22-1

67) Novella Ltd. reported a return on investment of 16%, an asset turnover of 6, and income of \$190,000.

On the basis of this information, the company's invested capital was

- A) \$1,187,500.
- B) \$7,125,000.
- C) \$1,140,000.
- D) \$197,917.
- E) \$182,400.

Answer: A

Explanation: A)  $\$190,000 / \text{Assets} = 16\%$  Assets = \$1,187,500

Diff: 2 Type: MC

Skill: Apply

Objective: LO 22-1

68) For the period just ended, Trident Ltd. reported profit of \$22.6 million and invested capital of \$250 million. Assuming an imputed interest rate of 8%, which of the following choices correctly denotes Trident's return on investment (ROI) and residual income respectively?

- A) 8.32%; \$20.792 million
- B) 9.04%; \$20,792 million
- C) 9.76%; \$4.408 million
- D) 9.04%; \$2.6 million
- E) 9.76%; \$2.6 million

Answer: D

Explanation: D)  $ROI = \$22.6 / \$250 = 9.04\%$  RI =  $\$22.6 - [\$250 \times 8\%] = \$22.6 - \$20 = \$2.6$

Diff: 2 Type: MC

Skill: Apply

Objective: LO 22-1

69) Which two ratios are used in the DuPont method of profitability analysis to create return on assets?

- A) profit margin and asset turnover
- B) asset turnover and return on investment
- C) profit margin and operating leverage
- D) profit margin and return on sales
- E) return on sales and return on assets

Answer: A

Explanation: A) DuPont = Income/Sales \* Sales/Asset = Profit Margin (or ROS) \* Asset turnover

Diff: 2 Type: MC

Skill: Remember

Objective: LO 22-1

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

Miller Medical Services provided the following information for its past year's operations in its Hospital Bed Division.

Revenues	\$2,000,000
Accounts receivable	500,000
Total assets	1,500,000
Operating income	800,000
Taxable income	520,000

70) What is the Hospital Bed Division's return on sales if income is defined as operating income?

- A) 0.40
- B) 0.53
- C) 0.92
- D) 1.33
- E) 2.50

Answer: A

Explanation: A)  $\$800,000 / \$2,000,000 = 40\%$

Diff: 1 Type: MC

Skill: Apply

Objective: LO 22-1

71) What is the Hospital Bed Division's asset turnover?

- A) 0.00
- B) 0.53
- C) 0.92
- D) 1.33
- E) 2.50

Answer: D

Explanation: D)  $\$2,000,000 / \$1,500,000 = 1.33$

Diff: 2 Type: MC

Skill: Apply

Objective: LO 22-1



72) Batman Abstract Company has three divisions that operate autonomously. Their results for the current year were as follows:

	<b>Riddler</b>	<b>Joker</b>	<b>Penguin</b>
Sales	\$5,000,000	\$7,000,000	\$10,000,000
Contribution margin	1,440,000	1,700,000	3,500,000
Operating income	1,000,000	1,750,000	2,520,000
Investment base	9,000,000	10,000,000	14,000,000

The company's desired rate of return is 20%.

Required:

- Compute each division's ROI.
- Compute each division's residual income.
- Rank each division by both ROI and residual income.

Answer:

a.

$$\begin{aligned}
 \text{Riddler ROI} &= \$1,000,000 / \$9,000,000 = 0.111 \\
 \text{Joker ROI} &= \$1,750,000 / \$10,000,000 = 0.175 \\
 \text{Penguin ROI} &= \$2,520,000 / \$14,000,000 = 0.180
 \end{aligned}$$

b.

	<b>Riddler</b>	<b>Joker</b>	<b>Penguin</b>
Investment base	\$9,000,000	\$10,000,000	\$14,000,000
Minimum rate	$\times 0.20$	$\times 0.20$	$\times 0.20$
Minimum return	<u>\$1,800,000</u>	<u>\$2,000,000</u>	<u>\$2,800,000</u>
Income	\$1,000,000	\$1,750,000	\$2,520,000
Minimum return	<u>1,800,000</u>	<u>2,000,000</u>	<u>2,800,000</u>
Residual income	<u><u>\$(800,000)</u></u>	<u><u>\$(250,000)</u></u>	<u><u>\$(280,000)</u></u>

c.

ROI Rank:

Penguin # 1

Joker # 2

Riddler # 3

RI Rank:

Joker #1

Penguin #2

Riddler #3

Diff: 2 Type: ES

Skill: Apply

Objective: LO 22-1

73) Hargrave Products has three divisions which operate autonomously. Their results for the current year were as follows:

	East	West	International
Sales	\$30,000,000	\$40,000,000	\$50,000,000
Cost of goods sold	15,000,000	25,000,000	37,000,000
Operating income	4,500,000	4,750,000	5,000,000
Investment base	30,000,000	30,500,000	31,000,000

The company's desired rate of return is 15 percent.

Required:

- Compute each division's ROI. Round to three decimal places.
- Compute each division's residual income.
- Rank each division by both ROI and residual income.

Answer: East ROI =  $\$4,500,000 / \$30,000,000 = 0.150$

West ROI =  $\$4,750,000 / \$30,500,000 = 0.156$

International =  $\$5,000,000 / \$31,000,000 = 0.161$

b.	East	West	International
Investment base	\$30,000,000	\$30,500,000	\$31,000,000
Minimum rate	$\times 0.15$	$\times 0.15$	$\times 0.15$
Minimum return	<u>\$4,500,000</u>	<u>\$4,575,000</u>	<u>\$4,650,000</u>
Income	\$4,500,000	\$4,750,000	\$5,000,000
Minimum return	<u>4,500,000</u>	<u>4,575,000</u>	<u>4,650,000</u>
Residual income	<u>\$0</u>	<u>\$175,000</u>	<u>\$350,000</u>

c.

ROI Rank:

Int'l # 1

West # 2

East # 3

RI Rank:

Int'l # 1

West # 2

East # 3

Diff: 2 Type: ES

Skill: Apply

Objective: LO 22-1

74) Kase Tractor Company allows its divisions to operate as autonomous units. Their results for the current year were as follows:

	Plows	Tractors	Combines
Revenues	\$2,250,000	\$500,000	\$4,800,000
Current assets	800,000	152,500	1,435,000
Capital assets	1,000,000	400,000	1,750,000
Current liabilities	350,000	75,000	540,000
Net operating income	220,000	60,000	480,000
After-tax income	143,000	39,000	312,000
Weighted average cost of capital	8.5%	8.5%	8.5%

Required:

For each division compute the

- return on sales
- return on investment based on total assets employed
- economic value added
- residual income based on net operating income

Answer:

a. *Return on Sales:*

Plows	= \$220,000/\$2,250,000	= 0.10
Tractors	= \$60,000/\$500,000	= 0.12
Combines	= \$480,000/\$4,800,000	= 0.10

b. *ROI:*

Plows	= \$220,000/\$1,800,000	= 12.2%
Tractors	= \$60,000/\$552,500	= 10.9%
Combines	= \$480,000/\$3,185,000	= 15.1%

c. *EVA:*

	<u>Plows</u>	<u>Tractors</u>	<u>Combines</u>
After-tax income	\$143,000	\$39,000	\$312,000
Less: sub-totals*	<u>\$123,250</u>	<u>\$40,588</u>	<u>\$244,825</u>
Economic value-added	<u>\$19,750</u>	<u>\$(1,588)</u>	<u>\$87,175</u>
Total assets - current liabilities	\$1,450,000	\$477,500	\$2,645,000
WACC	<u>8.5%</u>	<u>8.5%</u>	<u>8.5%</u>
*Sub-totals	\$123,250	\$40,588	\$244,825

d. *Residual income:*

Plows	= \$220,000 - (.085 × \$1,800,000)=	\$ 67,000
Tractors	= \$60,000 - (.085 × \$552,500) =	\$ 13,038
Combines	= \$480,000 - (.085 × \$3,185,000) =	\$ 209,275

Diff: 2 Type: ES

Skill: Apply

Objective: LO 22-1

75) Jim's Quality Pre-owned Auto Sales Ltd. allows its divisions to operate as autonomous units. Their results for the current year were as follows:

	SUVs	Trucks	Cars
Revenues	\$1,650,000	\$900,000	\$5,800,000
Current assets	210,000	152,500	419,000
Capital assets	870,000	630,000	1,590,000
Current liabilities	275,000	127,000	399,000
Net operating income	235,000	70,000	560,000
After-tax income	186,000	55,404	443,234
Weighted average cost of capital	9.5%	9.5%	9.5%

Required:

For each division compute the

- return on sales
- return on investment based on total assets employed
- economic value added
- residual income based on net operating income

Answer:

a. *Return on Sales:*

SUVs	= \$235,000/\$1,650,000	= 0.14
Trucks	= \$70,000/\$900,000	= 0.08
Cars	= \$560,000/\$5,800,000	= 0.10

b. *ROI:*

SUVs	= \$235,000/\$1,080,000	= 21.8%
Trucks	= \$70,000/\$782,500	= 8.9%
Cars	= \$560,000/\$2,009,000	= 27.9%

c. *EVA:*

	<u>SUVs</u>	<u>Trucks</u>	<u>Cars</u>
After-tax income	\$186,000	\$55,404	\$443,234
Less: sub-totals*	<u>\$76,475</u>	<u>\$62,273</u>	<u>\$152,950</u>
Economic value-added	<u>\$109,525</u>	<u>\$(6,869)</u>	<u>\$290,284</u>
Total assets - current liabilities	\$805,000	\$655,500	\$1,610,000
WACC	<u>9.5%</u>	<u>9.5%</u>	<u>9.5%</u>
*Sub-totals	\$76,475	\$62,273	\$152,950

d. *Residual income:*

SUVs	= \$235,000 - (.095 × \$1,080,000) =	\$ 132,400
Trucks	= \$70,000 - (.095 × \$782,500) =	\$ (4,338)
Cars	= \$560,000 - (.095 × \$2,009,000) =	\$ 369,145

Diff: 2 Type: ES

Skill: Apply

Objective: LO 22-1

76) Museum Corporation uses the investment centre concept for the museums that it manages. Select operating data for three of its museums for the current year are as follows:

	<u>Montreal</u>	<u>Toronto</u>	<u>Vancouver</u>
Revenue	\$300,000	\$375,000	\$450,000
Total assets	150,000	125,000	175,000
Net operating income	25,500	28,000	29,500

Required:

- Compute the return on investment for each division.
- Which museum manager is doing best based only on ROI?
- What other accounting performance measures are available when evaluating the managers?

Answer:

- $\text{Montreal} = \$25,500 / \$150,000 = 0.170$   
 $\text{Toronto} = \$28,000 / \$125,000 = 0.224$   
 $\text{Vancouver} = \$29,500 / \$175,000 = 0.169$

b. Toronto was doing the best because the ROI was the highest, and as compared to Vancouver was doing better with fewer assets.

c. The company could consider examining the DuPont method, residual income, and EVA, and ROS, and also consider the time horizon of whatever performance it chooses.

Diff: 2 Type: ES

Skill: Apply

Objective: LO 22-1

77) The Coffee Division of Canadian Products is planning the operating budget for next year. Average total assets of \$1,500,000 will be used during the year and unit selling prices are expected to average \$100 each. Variable costs of the division are budgeted at \$400,000 while fixed costs are set at \$250,000. The company's required rate of return is 18%.

Required:

- Compute the volume necessary to achieve a 20% ROI.
- The division manager receives a bonus of 50% of the residual income. What is his anticipated bonus for next year assuming he achieves the targeted operating income in part a. and the required return is based on 18%?

Answer:

a.

$$\text{Target Operating income} = 0.20 \times \$1,500,000 = \$300,000$$

Operating income	\$300,000
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Variable costs	400,000
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Fixed costs	<u>250,000</u>
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Target revenues	<u>\$950,000</u>
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$$\text{Sales volume} = \$950,000 / \$100 = 9,500 \text{ units}$$

b.

Asset base	\$1,500,000
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Minimum rate	<u>× 0.18</u>
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Required return	<u>\$270,000</u>
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Target operating income	\$300,000
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Required return	<u>270,000</u>
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Residual income	<u>\$30,000</u>
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$$\text{Bonus} = \$30,000 \times 0.50 = \$15,000$$

Diff: 3 Type: ES

Skill: Analyze

Objective: LO 22-1

78) The Tea Division of Canadian Products is planning the operating budget for next year. Average total assets of \$1,700,000 will be used during the year and unit selling prices are expected to average \$250 each. Variable costs of the division are budgeted at \$600,000 while fixed costs are set at \$450,000. The company's required rate of return is 10%.

Required:

- Compute the volume necessary to achieve a 15% ROI.
- The division manager receives a bonus of 50% of the residual income. What is his anticipated bonus for next year assuming he achieves the targeted operating income in part a. and the required return is based on 10%?

Answer:

a.

Target Operating income =  $0.15 \times \$1,700,000 = \$255,000$

Operating income	\$255,000
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Variable costs	600,000
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Fixed costs	<u>450,000</u>
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Target revenues	<u>\$1,305,000</u>
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Sales volume =  $\$1,305,000 / \$250 = 5,220$  units

b.

Asset base	\$1,700,000
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Minimum rate	$\times 0.10$
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Required return	<u>\$170,000</u>
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Target operating income	\$255,000
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Required return	<u>170,000</u>
-----------------	----------------

Residual income	<u>\$85,000</u>
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Bonus =  $\$85,000 \times 0.50 = \$42,500$

Diff: 3 Type: ES

Skill: Analyze

Objective: LO 22-1

79) LaserLife Printer Cartridge Company is a decentralized organization with several autonomous divisions. The division managers are evaluated, in part, on the basis of the change in their return on invested assets. Operating results for the Packer Division for the upcoming year are budgeted as follows:

Sales	\$5,000,000
Less variable costs	<u>2,500,000</u>
Contribution margin	\$2,500,000
Less fixed expenses	<u>1,800,000</u>
Net operating income	<u>\$700,000</u>

Total assets for the division are currently \$3,600,000. For next year the division can add a new product line for an investment of \$600,000. The new product line will generate sales of \$1,600,000 and will incur fixed expenses of \$600,000 annually. Variable costs of the new product will average 60 percent of selling price.

Required:

- What will be the company's ROI after accepting the new product line?
- If the company's required rate of return is 6 percent, and residual income is used to evaluate managers, would this encourage the division to accept the new product line? Explain and show computations.



Answer:

a.

New investment:

Sales	\$1,600,000	
Variable costs	\$960,000	
Fixed costs	<u>600,000</u>	<u>1,560,000</u>
Operating income		<u>\$40,000</u>

Current ROI = \$700,000/\$3,600,000 = 0.194

New investment ROI = \$40,000/\$600,000 = 0.067

Combined ROI = \$740,000/\$4,200,000 = 0.176

Accepting the new product line will reduce the division's ROI. This would make the manager reluctant to make the investment.

b.

Investment	\$600,000
Minimum return	<u>× 0.06</u>
Required amount	<u>\$36,000</u>

Income	\$40,000
Required amount	36,000
Residual income	<u>\$4,000</u>

Manager would accept investment because income is increased by \$4,000.

Diff: 3 Type: ES

Skill: Analyze

Objective: LO 22-1

80) Capital Investments has three divisions. Each division's required rate of return is 15 percent. Planned operating results for next year are:

<u>Division</u>	<u>Operating income</u>	<u>Investment</u>
A	\$15,000,000	\$100,000,000
B	25,000,000	125,000,000
C	11,000,000	50,000,000

The company is planning an expansion requiring each division to increase its investments by \$25,000,000 and its income by \$4,500,000.

Required:

- Compute the current ROI for each division.
- Compute the current residual income for each division.
- Rank the divisions according to their current ROIs and residual incomes.
- Determine the effects after adding the new project to each division's ROI and residual income.
- Which Divisions are pleased with the addition and which ones are unhappy assuming the managers are evaluated on a combination of ROI and residual income? Is a combination of ROI and residual income appropriate for the divisions?

Answer:

- $A \text{ ROI} = \$15,000,000 / \$100,000,000 = 0.15$   
 $B \text{ ROI} = \$25,000,000 / \$125,000,000 = 0.20$   
 $C \text{ ROI} = \$11,000,000 / \$50,000,000 = 0.22$
- $A \text{ RI} = \$15,000,000 - (\$100,000,000 \times 0.15) = \$0$   
 $B \text{ RI} = \$25,000,000 - (\$125,000,000 \times 0.15) = \$6,250,000$   
 $C \text{ RI} = \$11,000,000 - (\$50,000,000 \times 0.15) = \$3,500,000$
- ROI Rank:    RI Rank:  
 1. C            1. B  
 2. B            2. C  
 3. A            3. A
- $A \text{ ROI} = \$19,500,000 / \$125,000,000 = 0.156$   
 $B \text{ ROI} = \$29,500,000 / \$150,000,000 = 0.197$   
 $C \text{ ROI} = \$15,500,000 / \$75,000,000 = 0.207$   
  
 $A \text{ RI} = \$19,500,000 - (\$125,000,000 \times 0.15) = \$750,000$   
 $B \text{ RI} = \$29,500,000 - (\$150,000,000 \times 0.15) = \$7,000,000$   
 $C \text{ RI} = \$15,500,000 - (\$75,000,000 \times 0.15) = \$4,250,000$
- Everyone is pleased that only residual income is used because their residual incomes go up. However, it is difficult to evaluate on a comparative basis because the investment base is very different for the divisions.

Only the manager of A is pleased with the new investment if ROI is used because that is the only division where ROI increased. In the case of additional investments which are required by corporate management, residual income may be the best to use for evaluating each manager individually but not collectively.

Diff: 2 Type: ES

Skill: Apply

Objective: LO 22-1

81) Provide the missing data for the following situations:

	Red <u>Division</u>	White <u>Division</u>	Blue <u>Division</u>
Sales	\$?	\$10,000,000	\$?
Net operating income	\$200,000	\$400,000	\$288,000
Total assets	\$?	\$?	\$1,600,000
Return on investment	0.16	0.10	?
Return on sales	0.04	?	0.12

Answer: Red Division:

$\$200,000 \div 0.16$

Total assets = \$1,250,000

ROS = Income/Sales

$0.04 = \$200,000/\text{Sales}$

Sales = \$5,000,000

White Division:

$\text{ROS} = \$400,000/\$10,000,000$

= 0.04

TA = NI ÷ ROI

$= \$400,000 \div 0.10$

= \$4,000,000

Blue Division:

Sales = NI ÷ ROS

$= 288,000 \div 0.12$

= \$2,400,000

$\text{ROI} = (2,400,000 \div 1,600,000) \times (288,000 \div 2,400,000) = 0.18$

Diff: 3 Type: ES

Skill: Apply

Objective: LO 22-1

82) Coptermagic Company supplies helicopters to corporate clients. Coptermagic has two sources of funds: long term debt with a market and book value of \$32 million issued at an interest rate of 10%, and equity capital that has a market value of \$18 million and book value of \$8 million. The cost of equity capital for Coptermagic is 15%, and its tax rate is 30%. Coptermagic has profit centres in four divisions that operate autonomously. The company's results for the past year are as follows:

	Operating Income	Assets	Current Liabilities
Brandon	\$1,750,000	\$11,500,000	\$2,500,000
Hamilton	2,400,000	9,000,000	3,500,000
Penticton	4,675,000	27,500,000	9,500,000
Halifax	4,200,000	25,000,000	8,000,000

Required:

- Compute Coptermagic's weighted average cost of capital.
- Compute each division's Economic Value Added.
- Rank the divisions by EVA.

Answer:

$$\begin{aligned} \text{a. WACC} &= [(0.10 \times (1 - 0.30) \times \$32,000,000) + (0.15 \times \$18,000,000)] / \$50,000,000 \\ &= 9.88 \% \end{aligned}$$

$$\begin{aligned} \text{b. Brandon (EVA)} &= [(\$1,750,000 \times (1 - 0.30))] - [0.0988 \times (\$11,500,000 - \$2,500,000)] \\ &= \$1,225,000 - \$889,200 = \$335,800 \end{aligned}$$

$$\begin{aligned} \text{Hamilton (EVA)} &= [(\$2,400,000 \times (1 - 0.30))] - [0.0988 \times (\$9,000,000 - \$3,500,000)] \\ &= \$1,680,000 - \$543,400 = \$1,136,600 \end{aligned}$$

$$\begin{aligned} \text{Penticton (EVA)} &= [(\$4,675,000 \times (1 - 0.30))] - [0.0988 \times (\$27,500,000 - \$9,500,000)] \\ &= \$3,272,500 - \$1,788,400 = \$1,494,100 \end{aligned}$$

$$\begin{aligned} \text{Halifax (EVA)} &= [(\$4,200,000 \times (1 - 0.30))] - [0.0988 \times (\$25,000,000 - \$8,000,000)] \\ &= \$2,940,000 - \$1,679,600 = \$1,260,400 \end{aligned}$$

- Rank:  
Penticton # 1  
Halifax # 2  
Hamilton # 3  
Brandon #4

Diff: 2 Type: ES

Skill: Apply

Objective: LO 22-1

83) Last year Reynolds Ltd. reported the following results:

Sales	\$1,450,000
Cost of Goods Sold	870,000
Operating Expenses	230,000
Assets	2,187,500

Required:

- Using the DuPont method, calculate the company's return on investment for the year just ended.
- Assuming the company's sales, operating expenses, and assets remain the same as last year, by how much would the gross margin percentage have to increase to achieve a 20% return on investment?
- Assume the company sets a minimum required return of 13%, what would the residual income be?

Answer:

- $ROI = \text{Income}/\text{Sales} * \text{Sales}/\text{Assets}$

$$\text{Income} = \$1,450,000 - \$870,000 - \$230,000 = \$350,000$$

$$ROI = \$350,000/\$1,450,000 * \$1,450,000/\$2,187,500 = 24.14\% * 0.6629 = 16\%$$

- Target ROI = 20% \* \$2,187,500 = \$437,500

$$\text{Sales} - \text{CGS} - \text{Operating Expenses} = \$437,500$$

$$\$1,450,000 - X - \$230,000 = \$437,500$$

$$X = \$782,500 = \text{CGS}$$

$$\text{CGS}/\text{Sales} = \$782,500/\$1,450,000 = 53.97\% \text{ Gross Margin} = 1 - 53.97\% = 46.03\%$$

$$\text{Current GM} = \$1,450,000 - \$870,000 = \$580,000; \text{GM}\% = \$580,000/\$1,450,000 = 40\%$$

$$\text{GM \% would have to increase by } 6.03\%$$

- Residual Income = \$350,000 - (.13 \* \$2,187,500) = \$350,000 - \$284,375 = \$65,625

Diff: 3 Type: ES

Skill: Analyze

Objective: LO 22-1

84) Chaucer Ltd. has current assets of \$450,000 and capital assets of \$630,000. Its budgeted production volume for the next fiscal year is 200,000 units. Fixed costs are projected at \$400,000 and variable unit costs for the one product produced total \$5/unit. The company defines ROI as Operating Income/Total Assets and its required rate of return is 14%.

Required:

- a. What selling price should Chaucer charge for its product if it wishes to achieve a 25% ROI? What is the operating income at this price?
- b. The general manager for Chaucer receives a bonus equal to 12% of the residual income for the period. Calculate the amount of the bonus assuming the selling price calculated in part a).
- c. Prepare a brief memo to the President of Chaucer outlining the advantages and disadvantages of ROI and Residual Income. Include your recommendations for the most appropriate method for calculating the bonus.

Answer:

a.

$$\text{Total assets} = \$450,000 + \$630,000 = \$1,080,000$$

$$\text{Target OI} = 25\% * \$1,080,000 = \$270,000$$

$$\text{SP} = [200,000 * X] - [200,000 * \$5] - \$400,000 = \$270,000$$

$$200,000X = \$1,670,000$$

$$X = \$8.35$$

b.

$$\text{Residual Income} = \$270,000 - (14\% * \$1,080,000) = \$270,000 - \$151,200 = \$118,800$$

$$\text{Bonus} = 12\% * \$118,800 = \$14,256$$

c.

Memo

To: President Chaucer Inc.

From: xxxxx

Re: Evaluation of Performance Measures

Our company is currently evaluating the use of return on investment and residual income as performance measures. Both of these measures are appropriate in evaluating the performance of managers in investment centres, that is, managers that have control over revenues, costs and the asset base.

Return on investment (ROI) is a common performance measure that is well understood. It calculates a result in percentage terms which is useful when comparing divisions or organizations of different sizes. However it is important to note that one must be careful when comparing organizations in different industries as asset bases are impacted by the nature of the industry. For example, automated industries are likely to have high investment bases in facilities and equipment.

The DuPont method is particularly useful in ROI calculations as it breaks down the ROI into the profit margin and the asset turnover. This allows examination of the drivers of the ROI. Is ROI improving (or declining) due to profitability (as measured by the profit margin) or asset productivity (as measured by the asset turnover). The problem with ROI is that it can lead to goal incongruent behaviour. This occurs when investment opportunities are available, but their returns fall short of the current ROI. Managers will have a disincentive to pursue these opportunities as they will lower the ROI and potentially bonuses.

Residual income addresses this problem of goal incongruence. Residual income uses a minimum required rate of return in its calculation. This ensures that investment opportunities that meet this corporate target will be accepted as all opportunities that exceed the minimum return will improve residual income and improve bonuses. Hence managers will be motivated to pursue these investments. Residual income is calculated as a dollar amount and therefore highlights magnitude of the dollar return.

Recommendations:

Students' recommendations should be assessed based on their support of their position. The selection of performance measures should align with corporate goals. Generally RI is considered superior due to the issue of goal congruence as outlined in the memo above. Students should also discuss the use of non-financial performance measures.

Diff: 3 Type: ES

Skill: Analyze

Objective: LO 22-1

85) Randall Ltd. reported the following results for its two divisions:

<b>Division A</b>	<b>2015</b>	<b>2016</b>
Sales	\$260,000	\$260,000
Operating Income	19,240	18,460
Investment	98,000	96,000

<b>Division B</b>	<b>2015</b>	<b>2016</b>
Sales	\$416,000	\$416,000
Operating Income	30,784	29,536
Investment	192,400	192,400

Required:

- Using the DuPont method, calculate the return on investment for each division for each year.
- Comment on the performance of each division.

Answer:

a.

Division A:

2015:  $\$19,240 / \$260,000 * \$260,000 / \$98,000 = 7.4\% * 2.653 = 19.63\%$

2016:  $\$18,460 / \$260,000 * \$260,000 / \$96,000 = 7.1\% * 2.708 = 19.23\%$

Division B:

2015:  $\$30,784 / \$416,000 * \$416,000 / \$192,400 = 7.4\% * 2.162 = 16\%$

2016:  $\$29,536 / \$416,000 * \$416,000 / \$192,400 = 7.1\% * 2.162 = 15.35\%$

b.

Both divisions experienced the similar profit margins in both years. Both experienced a decline in their profit margins from 2015 to 2016. Division B maintained its asset turnover in 2016, while Division A reported an increase in its asset turnover. Note this may be artificial as it may be a result of depreciation on the investment base.

Diff: 2 Type: ES

Skill: Apply

Objective: LO 22-1

86) The following table presents information related to three divisions of Bacchus Ltd.:

	Alpha Division	Beta Division	Delta Division
Sales	\$12,000,000	E	I
Operating Income	\$2,640,000	F	\$450,000
Profit Margin	A	24%	25%
Asset Turnover	B	G	1.2 times
ROI	C	19.2%	J
Investment	\$6,600,000	H	K
Residual Income	D	\$138,000	L

The company's required rate of return is 10%.

Required:

Solve for the unknowns.

Answer: Bacchus Ltd.:

	Alpha Division	Beta Division	Delta Division
Sales	\$12,000,000	E = \$1,200,000	I = \$1,800,000
Operating Income	\$2,640,000	F = \$288,000	\$450,000
Profit Margin	A = 22%	24%	25%
Asset Turnover	B = 1.818	G = 0.8	1.2 times
ROI	C = 40%	19.2%	J = 30%
Investment	\$6,600,000	H = \$1,500,000	K = \$1,500,000
Residual Income	D = \$1,980,000	\$138,000	L = \$300,000

Alpha Division:

$$A = \$2,640,000 / \$12,000,000 = 22\%$$

$$B = \$12,000,000 / \$6,600,000 = 1.818 \text{ times}$$

$$C = \$2,640,000 / \$6,600,000 = 40\% \text{ or } 1.818 * 22\% = 40\%$$

$$D = \$2,640,000 - (10\% * \$6,600,000) = \$1,980,000$$



Beta Division:

ROI = Profit Margin \* Asset Turnover

19.2% = 24% \* Asset Turnover

Asset Turnover = 0.8 times = G

Residual Income = \$138,000 = (19.2% \* investment) - (10% \* investment)

\$138,000/0.092 = \$1,500,000 = H

Income = 19.2% \* \$1,500,000 = \$288,000 = F

Sales/Assets = 0.8

E/\$1,500,000 = 0.8 Sales = \$1,200,000 = E

Delta Division

Income/Sales = Profit Margin

\$450,000/I = 25% I = \$1,800,000

Asset turnover = Sales/Assets

\$1,800,000/K = 1.2 K = \$1,500,000

ROI = Income/Investment

J = \$450,000/\$1,500,000 = 30%

L = \$450,000 - (.10 \* \$1,500,000) = \$300,000

Diff: 3 Type: ES

Skill: Apply

Objective: LO 22-1

87) Stratton Industries has two divisions. These divisions reported the following results for the year just ended:

	Division 1	Division 2
Operating Income	\$840,000	\$180,000
Assets	\$4,200,000	\$750,000

Required:

a. Calculate the ROI for each division. Which division would you consider to be the most successful?

Why?

b. Now assume that the company requires a 14% minimum rate of return. Calculate the residual income for each division. Which division would you consider to be the most successful? Why?

Answer:

a.

ROI Division 1 = \$840,000/\$4,200,000 = 20%

ROI Division 2 = \$180,000/\$750,000 = 24%

Using ROI as a performance measure, Division 2 would appear to be more successful as its ROI outperformed Division 1. However in absolute dollars, Division 1 outperformed Division 2. To assess performance more completely, we would need to consider the company's cost of capital.

b.

RI Division 1 = \$840,000 - (.14\*\$4,200,000) = \$840,000 - \$588,000 = \$252,000

RI Division 2 = \$180,000 - (.14\*\$750,000) = \$180,000 - \$105,000 = \$75,000

Using Residual Income as the criterion to evaluate success, Division 1 is more successful.

Diff: 1 Type: ES

Skill: Apply

Objective: LO 22-1

88) Consolidated Gas Supply Corporation uses the investment center concept for the gasoline stations that it manages in the city. Consolidated has a 15% required rate of return on investment in order for a branch station to be viable. Select operating data for three of its stations for the current year are as follows:

	<b>Maple Street</b>	<b>Oak Street</b>	<b>Hickory Street</b>
Revenue	\$17,000,000	\$13,500,000	\$15,000,000
Operating assets	7,000,000	7,000,000	5,000,000
Current liabilities	300,000	250,000	360,000
Net operating income	960,000	1,150,000	910,000

Required:

- Compute the return on investment for each station.
- Which station manager is doing best based only on ROI?
- Are any of the stations under performing?
- Should the required rate of return be the same for each station if the business risks are different?

Explain.

Answer:

- |         |                           |         |
|---------|---------------------------|---------|
| Maple   | = \$960,000/\$7,000,000   | = 0.137 |
| Oak     | = \$1,150,000/\$7,000,000 | = 0.164 |
| Hickory | = \$910,000/\$5,000,000   | = 0.182 |

- Hickory Street was doing the best because the ROI was the highest.

- Maple Street is in danger of being shut down because it is only making a return on its investment base of 13.7%. This is less than the required rate of return of 15%.

- If the risks are different then the company should use a risk adjusted ROR for each station to account for the different risk profiles.

Diff: 2 Type: ES

Skill: Apply

Objective: LO 22-1

89) Gasfield Maintenance Ltd. purchased equipment for \$225,000 that was CCA Class 8 (CCA rate of 20%). The vehicle was the only item in the Class 8 capital cost allowance pool. The vehicle is expected to generate net cash income, prior to tax effect, in the amount of \$75,000 per year. The company uses straight-line depreciation, estimates a 5 year useful life with a \$25,000 salvage value for the new equipment at the end of year 5. The marginal tax rate is 35% and the company's average tax rate is 25%. Management requires a rate of return of 15.0%. Assume that cash flows occur at the end of the year.

Required:

- What is the net present value of the investment in the vehicle? Include the effect of taxes in your calculation.
- What is the anticipated residual income for the first year? The company uses net cash income for its' RI calculations.
- What is the expected ROI for years one, two, and three assuming the company uses operating income and net book value for the calculations. What is the likely effect from using net book value in the ROI calculation on the management bonus system?

Answer:

- Net present value

- PV of after-tax net cash income:  $pmt = \$75,000 \times (1 - 0.35)$ ;  $i = 15\%$ ;  $n = 5$   
 $= \$163,418$
- PV tax shield:  
 $= [(\$225,000 \times 20\% \times 35\%)/(20\% + 15\%)] \times [(1 + (0.5 \times 15\%))/(1 + 15\%)]$  minus  $[(\$25,000 \times 20\% \times 35\%)/(20\% + 15\%)] \times [1/(1 + 15\%)^5]$   
 $= (\$45,000 \times 0.9348)$  minus  $(\$5,000 \times 0.4972)$   
 $= \$44,552$  (difference due to rounding)
- PV of salvage value:  $FV = \$25,000$ ;  $i = 15\%$ ;  $n = 5$   
 $= \$12,429$   
 $NPV = -\$225,000 + \$163,418 + 44,552 + \$12,429 = \$(4,601)$

- Residual income  
 $= \$75,000 - (\$225,000 \times 0.15) = \$41,250$

- ROI

	Year 1	Year 2	Year 3
BV beginning	\$225,000	\$185,000	\$145,000
Depreciation	40,000	40,000	40,000
BV ending	\$185,000	\$145,000	\$105,000
Operating income	\$35,000	\$35,000	\$35,000
ROI	18.9%	24.1%	33.3%

The management bonus system will have a built-in increase as the book value will decrease each year. This will provide management bonuses without any relation to performance and will motivate managers to not maintain or replace the asset.

Diff: 3 Type: ES

Skill: Apply

Objective: LO 22-1 & 20-3

90) R & D Storage is a small, but diversified, moving and storage company. In recent years its corporate income has declined to unacceptable levels. To change the direction of the company, the board of directors hired a new chief executive officer. She is currently considering three alternative ways as to how division managers are rewarded for their performance. They are; ROI, RI, and EVA.

Required:

Evaluate the CEO's plans by comparing the similarities and differences of the three methods.

Answer: ROI and RI consider income and the investment made, although ROI may introduce goal congruence problems. The CEO should consider the possibility of a multi-year time horizon, as the benefits of a manager's actions may not be evident in income until sometime in the future (i.e., the long-term), and it would be unwise to encourage managers to focus solely on the short-term. Economic value-added would be relevant if the CEO wants to be able to include tax effects in the performance measure.

Diff: 2 Type: ES

Skill: Understand

Objective: LO 22-1

91) The economic value added concept has attracted considerable attention in recent years. Explain the attractiveness of this number as a measure of performance.

Answer: The attractiveness of economic value added at the divisional level is primarily the fact that it allows managers to incorporate the cost of capital in decisions at the divisional level.

The economic value added concept, like residual income, charges managers for the cost of their investments in long-term assets and working capital. Value is created only if after-tax operating income exceeds the cost of investing the capital. To improve economic value added, managers must earn more operating income with the same capital, use less capital, or invest capital in high-return projects.

Diff: 2 Type: ES

Skill: Understand

Objective: LO 22-1

92) Companies are increasingly using nonfinancial measures to evaluate performance. Why? Since these numbers do not come from the company's financial records, why are they used?

Answer: The correct answer will revolve around the objective of providing quality goods to the corporation's customers. Quality goods bring repeat business and satisfied customers are a business's best advertisement.

The idea is that these nonfinancial measures concentrate on areas and questions that indicate the quality of a particular corporation's products. While some of these items do not come from a company's financial records, such as defect rates, they are quantifiable and can be verified.

Diff: 2 Type: ES

Skill: Understand

Objective: LO 22-1

93) List and describe the steps involved in making decisions on performance measures.

Answer:

1. *Identify and align accounting performance measures with financial goals.*

Does operating income, return on assets, or revenues best measure a subunit's financial goals?

2. *Decide on time horizons appropriate for each performance measure.*

Should the performance measures be calculated for one year or a multi year time horizon?

3. *Decide on how to define the components in each performance measure.*

Should assets be defined as total assets or net assets?

4. *Decide on an appropriate measurement method for each performance measure.*

Should assets be measured at historical cost or current cost?

5. *Decide on criteria/targets against which to assess measured performance.*

Should all subunits have the same targets such as the same required rate of return on assets?

6. *Decide on the timing of feedback.*

How often should manufacturing performance reports be sent to management?

7. *Decide on the elements of the compensation package.* What percentage should be fixed vs. variable salary?

What fringe benefits will be granted?

Diff: 2 Type: ES

Skill: Remember

Objective: LO 22-1

94) The term "investment" used in the calculation of accounting performance measures can vary from company to company. By using financial statement terminology describe four different ways that categories of accounts are used to determine the amount of investment.

Answer: *Total assets available.* Includes all business assets, regardless of their particular purpose.

*Total assets employed.* Defined as total assets available minus idle assets and minus assets purchased for future expansion. For example, if the Hull motel in Exhibit 22-2 has unused land set aside for potential expansion, the total assets employed by the motel would exclude the cost of that land.

*Working capital (current assets minus current liabilities) plus long-term assets.* This definition excludes that portion of current assets financed by short-term creditors (which generally has zero financing cost associated with it).

*Shareholders' equity.* Use of this definition for each individual motel in Exhibit 22-2 requires allocation of the long-term liabilities of Hospitality Inns to the three motels, which would then be deducted from the total assets of each motel.

Diff: 2 Type: ES

Skill: Remember

Objective: LO 22-1

22.2 Evaluate current-cost and historical-cost asset measurement methods.

1) Current cost is the cost of purchasing an asset today identical to the one currently held.

Answer: TRUE

Diff: 2 Type: TF

Skill: Remember

Objective: LO 22-2

2) The timing of feedback depends on the level of management that receives the information and on the complexity of the organization's information technology.

Answer: TRUE

Diff: 2 Type: TF

Skill: Remember

Objective: LO 22-2

3) Current cost return on investment is a better measure of the current economic returns from an investment than historical cost return on investment.

Answer: TRUE

Diff: 2 Type: TF

Skill: Remember

Objective: LO 22-2

4) Using gross book value as an investment base will result in a lower ROI than using net book value as an investment base.

Answer: TRUE

Diff: 2 Type: TF

Skill: Remember

Objective: LO 22-2

5) One way to achieve greater comparability of historical-cost based ROIs is to restate performance in current dollars.

Answer: TRUE

Diff: 2 Type: TF

Skill: Remember

Objective: LO 22-2

6) Using net book value when calculating return on investment encourages managers whose performance is measured by this metric to replace assets.

Answer: FALSE

Explanation: Purchasing assets will reduce ROI so the managers will be discouraged from doing so.

Diff: 2 Type: TF

Skill: Remember

Objective: LO 22-2

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

The following data are available for a foundry operation started as a new company four years ago when the construction cost index was 125:

Current liabilities	\$170,000
Operating income	\$176,200
NBV long-term assets (end year 3)	\$687,500
Current assets	\$300,000
Gross book value *	\$1,100,000
Estimated total useful life *	8 years
Age of assets *	4 years
Construction cost index end of year 4	150

\* = "of long-term assets at historical cost"

7) What is the net book value (NBV )of the long-term assets at current cost at the end of year 4?

- A) \$660,000
- B) \$800,000
- C) \$960,000
- D) \$1,180,000
- E) \$1,760,000

Answer: A

Explanation: A)  $1,100,000 \times 150/125 = 1,320,000$

$1,320,000 \times 4/8 = 660,000$

Diff: 3 Type: MC

Skill: Apply

Objective: LO 22-2

8) What is the current cost annual depreciation in year 4 dollars?

- A) \$165,000
- B) \$200,000
- C) \$240,000
- D) \$295,000
- E) \$440,000

Answer: A

Explanation: A)  $1,320,000 \times 1/8 = 165,000$

Diff: 3 Type: MC

Skill: Apply

Objective: LO 22-2

9) What is the year 4 operating income using year-4 current cost amortization?

- A) \$(126,300)
- B) \$176,200
- C) \$73,700
- D) \$18,700
- E) \$148,700

Answer: E

Explanation: E)  $176,200 + (\$1,100,000/8) - \$165,000 = \$148,700$

Diff: 3 Type: MC

Skill: Apply

Objective: LO 22-2

10) What is the ROI using current cost?

- A) (11.50)%
- B) 16.00%
- C) 22.5%
- D) 12.00%
- E) 11.25%

Answer: C

Explanation: C)  $148,700/660,000 = 22.5\%$

Diff: 3 Type: MC

Skill: Apply

Objective: LO 22-2

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

Ruth Cleaning Products manufactures home cleaning products. The company has two divisions, Bleach and Bleach-2. Because of different accounting methods and inflation rates, the company is considering multiple evaluation measures. The following information is provided for the year just ended:

	Assets <u>Book value</u>	Assets <u>Current value</u>	Income <u>Book value</u>	Income <u>Current value</u>
Bleach	\$225,000	\$300,000	\$150,000	\$155,000
Bleach-2	450,000	250,000	100,000	105,000

The company is currently using a required rate of return of 15 percent.

11) What are Bleach's and Bleach-2's return on investment based on current values?

- A) 0.22; 0.67
- B) 0.42; 0.52
- C) 0.52; 0.42
- D) 0.67; 0.22
- E) 0.50; 0.45

Answer: C

Explanation: C) Bleach:  $\$155,000/\$300,000 = 0.52$

Bleach-2:  $\$105,000/\$250,000 = 0.42$

Diff: 1 Type: MC

Skill: Apply

Objective: LO 22-2



12) What are Bleach's and Bleach-2's residual incomes, based on current values, respectively?

- A) \$116,250; \$37,500
- B) \$110,000; \$67,500
- C) \$67,500; \$110,000
- D) \$37,500; \$116,250
- E) \$115,340; \$80,000

Answer: B

Explanation: B) Current value ROI:

Bleach:  $\$155,000 - (\$300,000 \times 0.15) = \$110,000$

Bleach-2:  $\$105,000 - (\$250,000 \times 0.15) = \$67,500$

Diff: 2 Type: MC

Skill: Apply

Objective: LO 22-2

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

Carriage Ltd. manufactures baby carriages. The company has two divisions, Wheels and Assembly. Because of different accounting methods and inflation rates, the company is considering multiple evaluation measures. The following information is provided for the year just ended:

	ASSETS		INCOME	
	Book value	Current value	Book value	Current value
Wheels	\$485,000	\$550,000	\$120,000	\$160,000
Assembly	\$750,000	\$1,200,000	\$160,000	\$172,500

The company is currently using a 12% required rate of return.

13) What are Wheels and Assembly Divisions' return on investment based on book values, respectively?

- A) 0.21; 0.25
- B) 0.25; 0.21
- C) 0.14; 0.29
- D) 0.29; 0.14
- E) 0.33; 0.23

Answer: B

Explanation: B) Book value ROI:

Wheels:  $\$120,000/\$485,000 = 0.25$

Assembly:  $\$160,000/\$750,000 = 0.21$

Diff: 1 Type: MC

Skill: Apply

Objective: LO 22-2

14) What are Wheels's and Assembly's return on investment based on current values, respectively?

A) 0.21; 0.25

B) 0.25; 0.21

C) 0.14; 0.29

D) 0.29; 0.14

E) 0.33; 0.23

Answer: D

Explanation: D) Book value ROI:

Wheels:  $\$160,000 / \$550,000 = 0.29$

Assembly:  $\$172,500 / \$1,200,000 = 0.14$

Diff: 1 Type: MC

Skill: Apply

Objective: LO 22-2

15) What are Wheels's and Assembly's residual incomes based on book values, respectively?

A) \$74,000; \$28,500

B) \$61,800; \$70,000

C) \$63,500; \$59,500

D) \$28,500; \$74,000

E) \$101,800; \$70,000

Answer: B

Explanation: B) Book value RI:

Wheels:  $\$120,000 - (\$485,000 \times 0.12) = \$61,800$

Assembly:  $\$160,000 - (\$750,000 \times 0.12) = \$70,000$

Diff: 2 Type: MC

Skill: Apply

Objective: LO 22-2

16) What are Wheels's and Assembly's residual incomes based on current values, respectively?

A) \$70,000; \$28,500

B) \$94,000; \$28,500

C) \$94,000; \$70,000

D) \$28,500; \$94,000

E) \$61,800; \$70,000

Answer: B

Explanation: B) Current value RI:

Wheels:  $\$160,000 - (\$550,000 \times 0.12) = \$160,000 - \$66,000 = \$94,000$

Assembly:  $\$172,500 - (\$1,200,000 \times 0.12) = \$172,500 - \$144,000 = \$28,500$

Diff: 2 Type: MC

Skill: Apply

Objective: LO 22-2

- 17) The cost today of purchasing an asset identical to the one currently held is called a(n)
- A) actual cost.
  - B) current cost.
  - C) dual cost.
  - D) fixed cost.
  - E) sunk cost.

Answer: B

Diff: 1 Type: MC

Skill: Remember

Objective: LO 22-2

18) National Can Company has three divisions, Eastern, Midwestern, and Western. Because of very different accounting methods and inflation rates in different countries it is considering multiple evaluation measures. Information gathered about the divisions for the year just ended follows:

	Assets		Income	
	<u>Book value</u>	<u>Current value</u>	<u>Book value</u>	<u>Current value</u>
Eastern	\$600,000	\$900,000	\$120,000	\$110,000
Midwestern	700,000	700,000	120,000	120,000
Western	1,000,000	1,400,000	200,000	180,000

The company is currently using a required rate of return of 15 percent.

Required:

- Compute the ROI using both book value and current value for all divisions. Round to three decimal places.
- Compute residual income using book value and current value for all divisions.
- Does book value or current value provide the better basis for performance evaluation? Why? Which division is the most successful?

Answer:

a.

Book value ROI: Eastern =  $\$120,000 / \$600,000 = 0.200$

Midwestern =  $\$120,000 / \$700,000 = 0.171$

Western =  $\$200,000 / \$1,000,000 = 0.200$

Current ROI: Eastern =  $\$110,000 / \$900,000 = 0.122$

Midwestern =  $\$120,000 / \$700,000 = 0.171$

Western =  $\$180,000 / \$1,400,000 = 0.129$

b.

Book value RI: Eastern =  $\$120,000 - (\$600,000 \times 0.15) = \$30,000$

Midwestern =  $\$120,000 - (\$700,000 \times 0.15) = \$15,000$

Western =  $\$200,000 - (\$1,000,000 \times 0.15) = \$50,000$

Current RI: Eastern =  $\$110,000 - (\$900,000 \times 0.15) = (\$25,000)$

Midwestern =  $\$120,000 - (\$700,000 \times 0.15) = \$15,000$

Western =  $\$180,000 - (\$1,400,000 \times 0.15) = (\$30,000)$

c.

Because it reflects current costs, current value is generally better than book value. Using this basis, the Midwestern Division is the most successful. It has the highest ROI and RI.

Diff: 2 Type: ES

Skill: Apply

Objective: LO 22-2

19) Holmes Electronics Ltd. has three divisions: Resistors, Semiconductors and Transistors, each located in a different geographic region. Data for its most recent year are presented below:

	Assets		Income	
	<u>Book value</u>	<u>Current value</u>	<u>Book value</u>	<u>Current value</u>
Resistors	\$750,000	\$980,000	\$180,000	\$130,000
Semiconductors	900,000	925,000	170,000	190,000
Transistors	1,600,000	1,800,000	260,000	210,000

The company is currently using a required rate of return of 16 percent.

Required:

- Compute the ROI using both book value and current value for all divisions. Round to four decimal places.
- Compute residual income using book value and current value for all divisions.
- Does book value or current value provide the better basis for performance evaluation? Why? Which division is the most successful?

Answer:

a.

Book value ROI: Resistors =  $\$180,000 / \$750,000 = 0.2400$

Semiconductors =  $\$170,000 / \$900,000 = 0.1889$

Transistors =  $\$260,000 / \$1,600,000 = 0.1625$

Current ROI: Resistors =  $\$130,000 / \$980,000 = 0.1326$

Semiconductors =  $\$190,000 / \$925,000 = 0.2054$

Transistors =  $\$210,000 / \$1,800,000 = 0.1167$

b.

Book value RI: Resistors =  $\$180,000 - (\$750,000 \times 0.16) = \$180,000 - \$120,000 = \$60,000$

Semiconductors =  $\$170,000 - (\$900,000 \times 0.16) = \$170,000 - \$144,000 = \$26,000$

Transistors =  $\$260,000 - (\$1,600,000 \times 0.16) = \$260,000 - \$256,000 = \$4,000$

Current RI: Resistors =  $\$130,000 - (\$980,000 \times 0.16) = \$130,000 - \$156,800 = (\$26,800)$

Semiconductors =  $\$190,000 - (\$925,000 \times 0.16) = \$190,000 - \$148,000 = \$42,000$

Transistors =  $\$210,000 - (\$1,800,000 \times 0.16) = \$210,000 - \$288,000 = (\$78,000)$

c.

Because it reflects current costs, current value is generally better than book value. Using this basis, the Semiconductor Division is the most successful. It has the highest ROI and RI.

Diff: 2 Type: ES

Skill: Apply

Objective: LO 22-2

20) The following data are available for a manufacturing business started as a new company five years ago when the construction cost index was 115:

Current liabilities	\$190,000
Operating income	\$329,000
NBV long-term assets (end year 4)	\$1,200,000
Current assets	\$600,000
Gross book value *	\$2,000,000
Estimated total useful life *	10 years
Age of assets *	5 years
Construction cost index end of year 5	130

\* = "of long-term assets at historical cost"

Required:

Calculate the return on investment and the residual income for year five based on current cost. The company's required rate of return is 12%.

Answer: Current cost BV =  $\$2,000,000 \times 130/115 = \$2,260,870$

Current cost depreciation =  $\$2,260,870/10 \text{ years} = \$226,087$

Year five current value operating income =  $\$329,000 + \$200,000 - \$226,087 = \$302,913$

Current value BV end of year five =  $\$2,260,870 - (\$226,087 \times 5) = \$1,130,435$

ROI =  $\$302,913/\$1,130,435 = 27\%$

Residual income =  $\$302,913 - (\$2,260,870 \times 12\%) = \$31,609$

Diff: 3 Type: ES

Skill: Apply

Objective: LO 22-2

21) Current cost is defined as the cost of purchasing an asset today identical to the one currently held.

Required:

Discuss why this is a useful concept and explain some difficulties in its use.

Answer: Current costs are useful because they eliminate differences in the investment base caused by differences in prices. This may enhance comparability among divisions, particularly those that are located in different geographic regions. As a result current cost ROIs will result in better representations of economic returns.

A major difficulty in using current costs is the valuation of an identical asset. Does the exact asset currently exist? Many assets become technologically obsolete quickly. Even if the asset exists, it is very likely that a company would not choose to replace its existing asset with an identical asset, even if it could. It would opt for a "better" asset.

Diff: 2 Type: ES

Skill: Understand

Objective: LO 22-2

22.3 Analyze the technical difficulties that arise when comparing the performance of divisions operating in different countries.

1) Comparing the performance of divisions of a multinational company operating in different countries is difficult because of the differences in economic, legal, political, social and cultural environments.

Answer: TRUE

Diff: 1 Type: TF

Skill: Remember

Objective: LO 22-3

2) Benchmarks represent 'best practices', and can be derived from either inside or outside the organization.

Answer: TRUE

Diff: 1 Type: TF

Skill: Remember

Objective: LO 22-3

3) Divisions operating in different countries often record performance in different currencies.

Answer: TRUE

Diff: 1 Type: TF

Skill: Remember

Objective: LO 22-3

4) If the exchange rate at the end of the a foreign subsidiary's first year was 5 Fidgets to 1 Canadian dollar, and if it was 8 Fidgets to 1 Canadian dollar at the end of the second (current) year, what exchange rate should be used to convert total assets if we want to calculate the company's ROI in Canadian dollars?

A) the rate in effect when the ROI is calculated

B) the rate estimated to be in effect when the ROI is to be reported in the financial statements

C) the average rate for the year, assuming that the rate changed approximately evenly throughout the year

D) the rate in effect when the assets were acquired (ie. 5 to 1)

E) it would be double-counting to convert the assets - leave both assets and income in fidgets and the exchange rate for the numerator cancels out the exchange rate for the denominator

Answer: D

Diff: 2 Type: MC

Skill: Understand

Objective: LO 22-3

5) If a company is a multinational company with operations in several different countries, one way to achieve comparability of historical-cost based ROIs for facilities in different countries is to

- A) restate the results of operations using the cash basis method of accounting.
- B) use GAAP for all reporting and calculations.
- C) restate the results of all operations in dollars.
- D) identify the rate of inflation in the most inflationary division and restate the other divisions' results using that rate.
- E) do nothing, the ROIs are comparable without adjustments.

Answer: C

Diff: 2 Type: MC

Skill: Understand

Objective: LO 22-3

6) Which of the following statements is TRUE?

- A) The economic, legal, political, social, and cultural environments are always similar across countries.
- B) Governments in some countries may impose controls and limit selling prices of a company's products.
- C) The availability of materials and skilled labour does not normally differ across countries.
- D) There are no difficulties in comparing performance of divisions across different countries.
- E) Nonfinancial performance measures should not be used when comparing performance of divisions in different countries.

Answer: B

Diff: 2 Type: MC

Skill: Remember

Objective: LO 22-3

7) \_\_\_\_\_ and \_\_\_\_\_ would be uncontrollable factors that a firm would need to consider when evaluating the return on investment of an international division.

- A) Manager's experience; currency stability
- B) Manager's compensation; political climate
- C) Required rate of return; legal requirements
- D) Custom duties; cultural environment
- E) Cultural requirements; required rate of return

Answer: D

Diff: 2 Type: MC

Skill: Understand

Objective: LO 22-3



8) The Irnakk Corporation manufactures iPod covers in Canada and China. The operations are organized as decentralized divisions. The following information is available for the year just ended:

	<u>Canada Division</u>	<u>China Division</u>
Operating income	\$2,400,000	11,400,000 yuan
Total assets	\$16,000,000	75,000,000 yuan

The exchange rate at the time of Irnakk's investment (the end of the previous year) in China was 7.5 Chinese yuan = \$1 Canadian. During the year, the yuan declined steadily in value and the exchange rate at the end of the current year was 8.5 yuan = \$1 Canadian. The average exchange rate during the year was 8 yuan = \$1 Canadian.

Required:

- Calculate the Canadian Division's ROI for last year based on dollars.
- Calculate the Chinese Division's ROI for last year based on yuan.
- Which of Irnakk's two divisions earned the better ROI? Explain your answer, complete with supporting calculations showing the China Division ROI in Canadian dollars.

Answer:

- Canadian Division's ROI for the year =  $\$2,400,000 / \$16,000,000 = 15\%$
- Chinese Division's ROI for the year =  $11,400,000 \text{ yuan} / 75,000,000 \text{ yuan} = 15.2\%$
- Three steps are used to determine the answer. First, convert total assets in the Chinese Division into dollars at the exchange rate prevailing when these assets were acquired (7.5 yuan = \$1):

Total assets =  $75,000,000 \text{ yuan} / 7.5 \text{ yuan per dollar} = \$10,000,000$

Second, convert operating income in the Chinese Division into dollars at the average exchange rate prevailing during the year when the operating income was earned:

$11,400,000 \text{ yuan} / 8 \text{ yuan per dollar} = \$1,425,000$

Third, calculate the Chinese Division's comparable ROI for the year =  $\$1,425,000 / \$10,000,000 = 14.25\%$

The Chinese Division's ROI measured in yuan is helped by the inflation that occurred in China during the year because inflation boosted the Chinese Division's operating income. Given that the assets were acquired the previous year, the asset values should not be increased to reflect the inflation that occurred during the current year. The net effect of inflation on ROI calculated in yuan is to use an inflated value in the numerator relative to the denominator. Adjusting for inflation using currency differences that represent differential inflation negates the effects of any differences in inflation rates between the two countries on the calculation of ROI. After these adjustments, the Canadian Division shows a higher ROI (15% from part (a) above) than the Chinese Division (14.25%).

Diff: 3 Type: ES

Skill: Apply

Objective: LO 22-3

9) The Shamrock Corporation manufactures flower pots in Canada and Ireland. The operations are organized as decentralized divisions. The following information is available for the year just ended:

	<u>Canada Division</u>	<u>Irish Division</u>
Operating income	\$900,000	1,250,000 €
Total assets	\$3,500,000	2,100,000 €

The exchange rate at the time of Shamrock's investment (the end of the previous year) in Ireland was \$1.35 Canadian to 1.00 Euro. During the year, the Euro weakened steadily in value and the exchange rate at the end of the current year was 1.24 Canadian = \$1.00 Euro. The average exchange rate during the year was 1.28 Canadian = \$1.00 Euro.

Required:

- Calculate the Canadian Division's ROI for last year based on dollars.
- Calculate the Irish Division's ROI for last year based on Euros.
- Which of Shamrock's two divisions earned the better ROI? Explain your answer, complete with supporting calculations showing the Irish Division ROI in Canadian dollars.

Answer:

- Canadian Division's ROI for the year =  $\$900,000 / \$3,500,000 = 26\%$
- Irish Division's ROI for the year =  $1,250,000 \text{ €} / 2,100,000 \text{ €} = 60\%$
- Three steps are used to determine the answer. First, convert total assets in the Euro Division into dollars at the exchange rate prevailing when these assets were acquired:

Total assets =  $2,100,000 \text{ €} / 0.741 \text{ € per dollar} = \$2,834,008$

Second, convert operating income in the Euro Division into dollars at the average exchange rate prevailing during the year when the operating income was earned:

$1,250,000 \text{ €} / 0.781 \text{ € per dollar} = \$1,600,512$

Third, calculate the Irish Division's comparable ROI for the year =  $\$1,600,512 / \$2,834,008 = 56.5\%$

The Irish Division's ROI measured in euros is helped by the weakening of that currency. The effect of a strengthening Canadian dollar is to reduce the converted operating income in relation to the converted investment cost thereby reducing the Irish Division ROI in Canadian dollars. The Irish Division is still a much better performer based on ROI even when the effect of the currency is taken into account.

Diff: 3 Type: ES

Skill: Apply

Objective: LO 22-3

10) A multinational established a division in a South American country as a subsidiary corporation, with an initial investment in total assets of 13 million CU's (the local currency is CU's), which cost the company \$3,250,000 Canadian at the time. The company sent an experienced manager to run the division, and gave her a target of 13% required rate of return, promising a bonus if this was met and/or exceeded.

After one year, the subsidiary manager was pleased to report a 20% ROI.

You have been able to determine the following data pertaining to the subsidiary:

- Exchange rate at end of year was 8 CU's to 1 Cdn dollar
- Operating income was earned evenly throughout the year
- The exchange rate changed approximately evenly throughout the year

Required:

- a. Calculate the subsidiary's income in CU's.
- b. Calculate the subsidiary's return on investment in Canadian dollars.
- c. Calculate the subsidiary's residual income in Canadian dollars.

Answer:

- a.  $\text{income} \div 13,000,000 \text{ CU's} = .20$   
 $\text{income} = 2,600,000 \text{ CU's}$
- b. Old exchange rate = 4 CU's to 1 Cdn dollar (\$13,000,000 CU/\$3,250,000 Cdn)  
Average exchange rate =  $(4 + 8) \div 2 = 6 \text{ CU's to 1 Cdn dollar}$   
 $2,600,000 \text{ CU's} \div 6 = \$433,333$   
 $\$433,333 \div \$3,250,000 = 13.33\%$

- c.  $\$433,333 - (0.13 \times 3,250,000) = \$10,833$

Diff: 3 Type: ES

Skill: Analyze

Objective: LO 22-3

22.4 Evaluate the behavioural effects of salaries and incentives in compensation arrangements.

1) An important consideration in designing compensation arrangements is the tradeoff between creating incentives, and reducing risk.

Answer: FALSE

Explanation: ..., and imposing risk.

Diff: 2 Type: TF

Skill: Remember

Objective: LO 22-4

2) Moral hazard describes contexts in which, once risk is shared, the individual fails to make as much effort to avoid harm as when risk was not shared.

Answer: TRUE

Diff: 1 Type: TF

Skill: Remember

Objective: LO 22-4

3) Good performance measures do not change significantly with the manager's performance but change with factors that are beyond the manager's control.

Answer: FALSE

Explanation: Good performance measures correlate closely with manager's performance.

Diff: 2 Type: TF

Skill: Remember

Objective: LO 22-4

4) Well-designed compensation plans for executives focus on risk and long-term incentives.

Answer: FALSE

Explanation: Well-designed plans use a compensation mix that carefully balances risk and short and long-term incentives.

Diff: 2 Type: TF

Skill: Remember

Objective: LO 22-4

5) The only criticism of team-based compensation is that the incentives for individual employees to excel are diminished, harming overall performance.

Answer: FALSE

Explanation: An additional criticism is that there can be problems managing team members who are not productive contributors to the team's success but who, nevertheless, share in the team's rewards.

Diff: 2 Type: TF

Skill: Remember

Objective: LO 22-4

6) It is more cost-efficient for owners to bear risk than managers, because managers demand a premium (extra compensation) for bearing risk.

Answer: TRUE

Diff: 2 Type: TF

Skill: Remember

Objective: LO 22-4

7) \_\_\_\_\_ describes contexts in which, once risk is shared, the individual fails to make as much effort to avoid harm as when risk was not shared.

A) Goal congruence

B) Moral hazard

C) Management compensation

D) Incentive compensation

E) Executive compensation

Answer: B

Diff: 1 Type: MC

Skill: Understand

Objective: LO 22-4

- 8) The absence of good performance measures restricts the owner's ability to motivate managers through
- A) rewards for products.
  - B) performance-based incentives.
  - C) monetary rewards.
  - D) compensation.
  - E) non-financial rewards.

Answer: B

Diff: 2 Type: MC

Skill: Understand

Objective: LO 22-4

- 9) Which of the following statements is TRUE relative to performance evaluations?

- A) Managers should be evaluated for the whole organization's performance.
- B) Managers should be evaluated on things they can affect.
- C) Sales people cannot completely control the level of sales.
- D) Managers should not be evaluated on the things they can affect if the factors are not completely controllable.
- E) Managers should be evaluated on all items they affect regardless of the control they exert over them.

Answer: B

Diff: 2 Type: MC

Skill: Understand

Objective: LO 22-4

- 10) The benefits of tying performance measures more closely to a manager's efforts encourage the use of

- A) financial measures.
- B) nonfinancial measures.
- C) nonfinancial and financial measures.
- D) performance input measures.
- E) moral measures.

Answer: C

Diff: 2 Type: MC

Skill: Understand

Objective: LO 22-4

- 11) Measurement of one group's performance against the best possible level of performance exhibited by another group, either inside or outside the organization, is known as

- A) teamwork analysis.
- B) performance-variation analysis.
- C) comparative analysis.
- D) benchmarking.
- E) competition analysis.

Answer: D

Diff: 1 Type: MC

Skill: Remember

Objective: LO 22-4

- 12) Team incentives encourage cooperation by
- A) forcing people to work together on difficult tasks.
  - B) changing management style.
  - C) letting individuals help one another as they strive toward a common goal.
  - D) rewarding based on team performance.
  - E) rewarding team members individually.

Answer: D

Diff: 1 Type: MC

Skill: Understand

Objective: LO 22-4

13) Which type of compensation is most prevalent when a satisfactory performance measure cannot be designed?

- A) dividends
- B) stock options
- C) salary
- D) bonus based on ROI
- E) bonus based on ROI and/or RI

Answer: C

Diff: 1 Type: MC

Skill: Understand

Objective: LO 22-4

14) Bob Cellular Phone uses ROI to measure divisional performance. Annual ROI calculations for each division have traditionally employed the ending amount of invested capital along with annual operating income and net revenue. The DuPont method is generally used. The company's Phone Accessories Division had the following results:

Previous Year ROI =  $(\$2,000,000/\$20,000,000) \times (\$20,000,000/\$10,000,000) = 0.20$

Current Year ROI =  $(\$2,400,000/\$25,000,000) \times (\$25,000,000/\$15,000,000) = 0.16$

Corporate management was disappointed in the performance of the division for the current year since it had made an additional investment in the division which was budgeted for a 23 percent ROI.

Required:

- a. Discuss some factors that may have contributed to the decrease in ROI for the current year.
- b. Assume total assets employed are 10% less than total assets. What is the effect of using total assets employed when calculating ROI?

Answer:

a. While sales increased by 25 percent, net income only increased by 20 percent. This may indicate that expenses increased more than they should have. Apparently the expected marginal net income from the new investment was \$1,150,000  $(\$5,000,000 \times 0.23)$ , and either sales were too low or expenses high for the new products. Start-up costs may have also contributed to the increased expenses of the first year's operations.

b. Total assets employed, =  $\$10,000,000 \times 90\% = \$9,000,000$

ROI =  $\$2,400,000/\$9,000,000 = 0.267$

Using this formulation of ROI, management would be pleased with their results, since actual results exceed the budget results.

Diff: 3 Type: ES

Skill: Understand

Objective: LO 22-4

15) Broughton Industries Ltd. is a publicly traded company and is organized into divisions. The company currently has a stock option plan for its head office executives only and it now is considering establishing an incentive program for its divisional managers. The proposal is to create a bonus pool based on a predetermined percentage of corporate net income after taxes. Divisional managers will be eligible for money from the bonus pool based on achievement of divisional return on investment (ROI). The calculation of the divisional ROI will be based on divisional net income (including an allocation of head office charges) and investment is defined as total assets.

Required:

Evaluate the proposed incentive plan. What changes would you recommend, if any, to the proposal?

Answer: The proposed bonus plan is cash based. In addition to the company achieving income and establishing the bonus pool maximum, it must ensure it has sufficient cash on hand to pay out the bonuses.

Pros of the proposal:

The company has clearly defined the basis of the bonus calculation.

The measure selected is objective and verifiable.

The measure is relatively straightforward to calculate and is based on data captured by the accounting system.

Divisional managers will be motivated to increase corporate income as this will increase the amount of funds available for bonus distribution.

Cons of the proposal:

ROI is a short term performance measure. Future performance may be neglected as managers seek to maximize short term results.

ROI can also be manipulated by managers through the timing of expenditures. Managers may defer asset replacement and/or discretionary fixed costs.

Although the measure is clearly defined, not all costs (head office) are under the control of the divisional managers. The allocation of corporate costs may be subject to dispute.

The plan needs to be defined a bit more precisely. What percentage of corporate income will be available?

How will the pool be shared among existing managers?

The plan is based on a single performance measure.

Recommendations may include:

Establishing multiple performance measures including non-financial performance measures.

Using Residual Income in lieu of return on investment.

Including non-cash based incentives.

Defining ROI as controllable divisional income instead of divisional net income.

Diff: 3 Type: ES

Skill: Analyze

Objective: LO 22-4



16) Endicott Inc. has four divisions. Each division produces and sells a variety of industrial products. The company is developing a compensation plan for division managers. Three options are being considered: (a) salary, (b) performance based incentive using RI, (c) mix of salary and a performance based incentive using RI. What factors should be considered in designing this plan?

Answer: The basic trade-off to consider in designing the compensation plan for division managers is between creating incentives to get managers to work hard and imposing risk on them. Compensation based on RI creates incentives for the managers to work hard, but they also bear risk because RI is affected by some factors outside their control. For example, a division manager may work hard but uncontrollable factors (such as economic conditions) may cause RI to be reduced, thereby reducing the manager's compensation. A salary, independent of RI performance, does not impose any risk on managers but it also creates no incentives for them. For this reason, many companies use a mix of salary and a performance based incentive—the salary component reduces risk while the performance based component creates incentives.

Diff: 2 Type: ES

Skill: Understand

Objective: LO 22-4

22.5 Apply strategic concepts to analyze the four levers of control and evaluate their usefulness.

1) Ethical behaviour on the part of managers, while important for its own sake, is not paramount in importance.

Answer: FALSE

Explanation: Ethical behaviour is important for creating long-term shareholder value.

Diff: 2 Type: TF

Skill: Remember

Objective: LO 22-5

2) An interactive control system is a formal information system that managers use to focus organization attention and learning on key strategic issues.

Answer: TRUE

Diff: 2 Type: TF

Skill: Remember

Objective: LO 22-5

3) Boundary systems describe standards of behaviour and codes of conduct expected of all employees, especially actions that are off-limits.

Answer: TRUE

Diff: 2 Type: TF

Skill: Remember

Objective: LO 22-5

4) The "four levers" of control are operating profit before taxes, return on investment, residual income, and economic value added.

Answer: FALSE

Explanation: The "four levers" of control are diagnostic control systems, boundary systems, belief systems, and interactive control systems.

Diff: 2 Type: TF

Skill: Remember

Objective: LO 22-5

5) Measures which monitor critical performance variables that help managers track progress toward achieving a company's strategic goals are collectively called diagnostic control systems.

Answer: TRUE

Diff: 2 Type: TF

Skill: Remember

Objective: LO 22-5

6) How should environmental and ethical issues affect managers' performance evaluations?

A) Socially responsible companies set aggressive targets for income and ROI, which must be met before environmental and ethical issues become relevant.

B) Environmental responsibilities are met by adhering to the law of the land (e.g., pollution laws).

C) Issues that may be ethical concerns in Canada (e.g., bribery) may not be illegal in other countries, and multi-national companies must adhere to local custom.

D) Socially responsible companies include environmental and ethical targets in managers' performance evaluations.

E) Illegal behaviour is not part of management's concern, unless it affects the bottom line.

Answer: D

Diff: 2 Type: MC

Skill: Understand

Objective: LO 22-5

7) Which of the following is a difference between a diagnostic control system and an interactive control system?

A) A diagnostic control system focuses on meeting expectations, while an interactive control system focuses on standards of ethical behaviour.

B) A diagnostic control system focuses on standards of ethical behaviour while an interactive control system focus on meeting expectations.

C) Both systems focus on standards of ethical behaviour and meeting expectations.

D) A diagnostic control system focuses on organizational attention and learning on key strategic issues, while an interactive control system focuses on meeting expectations.

E) A diagnostic control system focuses on meeting expectations, while an interactive control system focuses on organizational attention and learning on key strategic issues.

Answer: E

Diff: 2 Type: MC

Skill: Remember

Objective: LO 22-5

8) A control system that focuses on meeting expectations is known as a(n)

- A) diagnostic control system.
- B) boundary system.
- C) belief system.
- D) interactive control system.
- E) isolated system.

Answer: A

Diff: 2 Type: MC

Skill: Remember

Objective: LO 22-5

9) A control system that describes standards of behaviour and codes of conduct expected of all employees, especially actions that are off-limits, is known as a(n)

- A) diagnostic control system.
- B) boundary system.
- C) belief system.
- D) interactive control system.
- E) isolated system.

Answer: B

Diff: 2 Type: MC

Skill: Remember

Objective: LO 22-5

10) A part of a control system that articulates the mission, purpose, and core values of a company is known as a(n)

- A) diagnostic control system.
- B) boundary system.
- C) belief system.
- D) interactive control system.
- E) isolated system.

Answer: C

Diff: 2 Type: MC

Skill: Remember

Objective: LO 22-5

11) A control system that attempts to focus an organization's attention and learning on key strategic issues is known as a(n)

- A) diagnostic control system.
- B) boundary system.
- C) belief system.
- D) interactive control system.
- E) isolated system.

Answer: D

Diff: 2 Type: MC

Skill: Remember

Objective: LO 22-5

12) Managers use \_\_\_\_\_ to create an ongoing dialog around the organization's key strategic issues to personally involve themselves in subordinates' decision-making activities.

- A) diagnostic control systems
- B) boundary systems
- C) belief systems
- D) interactive control systems
- E) isolated systems

Answer: D

Diff: 2 Type: MC

Skill: Remember

Objective: LO 22-5

13) "Levers of control," in addition to a diagnostic control system, are needed in an organization because

- A) diagnostic controls have been found to lead to poor financial performance.
- B) diagnostic controls have no place in a Balanced Scorecard system.
- C) pressure to perform on diagnostic controls may lead to unethical behaviour.
- D) they are mandated by the external accounting agencies.
- E) they are mandated by taxation agencies.

Answer: C

Diff: 2 Type: MC

Skill: Remember

Objective: LO 22-5

14) Alpine Ltd. has two divisions. Division A manufactures components that can be sold in the external market place or transferred to Division B for further processing. The following data relate to Division A's component product.

Variable manufacturing costs/unit	\$925
Fixed costs/unit at capacity	\$275
Selling price/unit	\$1,800

The capacity of the plant is 2,500 units per year.

Division B has offered to purchase 350 units from Division A at a price of \$1,600/unit, which is the market price of the component. The manager of Division A has refused this offer stating that it would only return a rate of 25.00%, when the divisional target return on sales is 28.00%. The Division A manager also states that additional fixed costs of \$195,000 would be required to produce the 350 units.

The corporate required rate of return is 18% of assets and the existing asset base in Division A is \$2,500,000.

Required:

- How many units must Division A sell in order to achieve its required ROR? What profit margin would be earned at this level of sales?
- Assume Division A currently sells 2,000 units to the external market and can accept Division B's offer without affecting its external sales. Evaluate the refusal of Division B's offer from the standpoint of the corporation as a whole and from Division A manager's perspective.
- Assume Division A currently sells 2,000 units to the external market and can accept Division B's offer without affecting its external sales. Calculate Division A's residual income with and without the sale to Division B.
- What recommendations would you give to the President of Alpine Ltd. with respect to performance evaluation of the divisions?

Answer:

a.

Target ROI = 18% \* \$2,500,000 = \$450,000

Fixed costs at capacity = \$275 \* 2,500 = \$687,500

Division must cover fixed costs of \$687,500 + target ROI of \$450,000 or \$1,137,500

CM on current sales = \$1,800 - \$925 = \$875

[Fixed Costs + Target OI]/Unit CM = Required sales in units

\$1,137,500/\$875 = 1,300 units

Sales at 1,300 units = 1,300 \* \$1,800 = \$2,340,000

Profit margin = \$450,000/\$2,340,000 = 19.2%

b.

Division B's offer is profitable,

Division A will make CM of \$1,600 - \$925 = \$675/unit

Total CM = \$675 \* 350 = \$236,250

The additional CM exceeds the incremental fixed costs of \$195,000 by \$41,250.

Division A would report a return on sales of 29.51% without the internal sale calculated as follows:

Sales	2,000 * \$1,800	\$3,600,000
CM	2,000 * \$875	\$1,750,000
Fixed Costs	2,500 * \$275	\$687,500
OI		\$1,062,500
ROS	1,062.5/3,600	29.51%

With the internal transfer Division A would report a return on sales of 26.53% calculated as follows:

Sales	\$3,600,000 + [350 * \$1,600]	\$4,160,000
CM on external	2,000 * \$875	\$1,750,000
CM on internal	350 * \$675	\$236,250
Fixed costs	2,500 * \$275	\$687,500
Fixed costs	special order	\$195,000
Profit		\$1,103,750
ROS	1,103.75/4160	26.53%

This comparison highlights Division A manager's point that the target return on sales will not be met if the internal transfer is accepted.

Note the ROIs would be:

Without the transfer: \$1,062,500/\$2,500,000 = 42.5%

With the transfer: \$1,103,750/\$2,500,000 = 44.15%

We see that ROI would be improved with the internal transfer.

From the company's perspective, the transfer SHOULD occur. Division B would have to purchase the component in the market at \$1,600, yet Division A's outlay cost to produce is only \$925 (variable cost) + \$557.14 (\$195,000/350) or \$1,482.14. Therefore the costs to make are less than the costs to buy, so the company should manufacture the component.

c.

Residual income (without the transfer) = \$1,062,500 - (.18 \* \$2,500,000) = \$1,062,500 - \$450,000 = \$612,500

Residual income (with the transfer) \$1,103,750 - (.18 \* \$2,500,000) = \$1,103,750 - \$450,000 = \$653,750.

In this case the Division A manager is motivated to accept the internal transfer because it increases the residual income of the division.

d.

Note that in this case, the ROI does improve. This may not always be the case. Residual income will encourage goal congruent behaviour as any returns over the corporate minimum will be viewed as favourable. However RI, (like ROI) remains a short term measure. Consideration should be given to including both non-financial performance measures and measures that are more long-term in nature.

Diff: 3 Type: ES

Skill: Analyze

Objective: Cumulative

15) Briefly explain each of the four levers of control. Why does a company need to implement more than a diagnostic control system?

Answer: The four levers of control are diagnostic control systems, boundary systems, belief systems, and interactive control systems. Companies must strive for performance, behave ethically, inspire employees, and respond to strategic threats and opportunities in the environment. Diagnostic control systems involve measures that help a company to diagnose whether or not a company is performing according to expectations. Boundary systems describe standards of behaviour and codes of conduct expected of all employees, especially actions that are off-limits. Belief systems articulate the mission, purpose, and core values of a company. Interactive control systems are formal information systems that managers use to focus organization attention and learning on key strategic issues.

The "levers of control," in addition to diagnostic control systems, are needed since the pressure to perform on diagnostic goals can be so strong that management might take steps to cut corners and make their performance look better than it really is. In addition, diagnostic systems might focus management too much on meeting short term goals that organization learning and attention to key strategic issues might be inadequate for the future.

Diff: 2 Type: ES

Skill: Understand

Objective: LO 22-5