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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Question Type | Difficulty | LO1: ROI | LO2: Residual income | LO3: Operating performance measures | LO4: Balanced scorecard | Other topics | Professional exam adapted |
|  | 1 | T/F | M | x |  |  |  |  |  |
|  | 2 | T/F | M | x |  |  |  |  |  |
|  | 3 | T/F | M | x |  |  |  |  |  |
|  | 4 | T/F | M | x |  |  |  |  |  |
|  | 5 | T/F | E | x |  |  |  |  |  |
|  | 6 | T/F | M | x |  |  |  |  |  |
|  | 7 | T/F | E | x |  |  |  |  |  |
|  | 8 | T/F | M | x |  |  |  |  |  |
|  | 9 | T/F | E | x |  |  |  |  |  |
|  | 10 | T/F | M | x | x |  |  |  |  |
|  | 11 | T/F | E | x | x |  |  |  |  |
|  | 12 | T/F | M | x | x |  |  |  |  |
|  | 13 | T/F | M |  | x |  |  |  |  |
|  | 14 | T/F | M |  | x |  |  |  |  |
|  | 15 | T/F | E |  |  | x |  |  |  |
|  | 16 | T/F | E |  |  | x |  |  |  |
|  | 17 | T/F | E |  |  | x |  |  |  |
|  | 18 | T/F | E |  |  | x |  |  |  |
|  | 19 | T/F | M |  |  | x |  |  |  |
|  | 20 | T/F | E |  |  | x |  |  |  |
|  | 21 | T/F | E |  |  | x |  |  |  |
|  | 22 | T/F | M |  |  |  | x |  |  |
|  | 23 | T/F | M |  |  |  | x |  |  |
|  | 24 | T/F | M |  |  |  |  | x |  |
|  | 25 | T/F | E |  |  |  |  | x |  |
|  | 26 | T/F | E |  |  |  |  | x |  |
|  | 27 | Conceptual M/C | M | x |  |  |  |  |  |
|  | 28 | Conceptual M/C | M | x |  |  |  |  |  |
|  | 29 | Conceptual M/C | M | x |  |  |  |  |  |
|  | 30 | Conceptual M/C | M | x |  |  |  |  |  |
|  | 31 | Conceptual M/C | M | x | x |  |  |  | CMA |
|  | 32 | Conceptual M/C | M | x | x |  |  |  |  |
|  | 33 | Conceptual M/C | M |  | x |  |  |  |  |
|  | 34 | Conceptual M/C | M |  | x |  |  |  |  |
|  | 35 | Conceptual M/C | E |  |  | x |  |  |  |
|  | 36 | Conceptual M/C | E |  |  | x |  |  |  |
|  | 37 | Conceptual M/C | M |  |  |  |  | x |  |
|  | 38 | Single Part M/C | M | x |  |  |  |  |  |
|  | 39 | Single Part M/C | M | x |  |  |  |  |  |
|  | 40 | Single Part M/C | H | x |  |  |  |  |  |
|  | 41 | Single Part M/C | H | x |  |  |  |  |  |
|  | 42 | Single Part M/C | H | x |  |  |  |  |  |
|  | 43 | Single Part M/C | H | x |  |  |  |  |  |
|  | 44 | Single Part M/C | M | x | x |  |  |  |  |
|  | 45 | Single Part M/C | E |  | x |  |  |  |  |
|  | 46 | Single Part M/C | H |  | x |  |  |  |  |
|  | 47 | Single Part M/C | E |  | x |  |  |  |  |
|  | 48 | Single Part M/C | E |  | x |  |  |  |  |
|  | 49 | Single Part M/C | E |  |  | x |  |  |  |
|  | 50 | Single Part M/C | E |  |  | x |  |  |  |
|  | 51 | Single Part M/C | E |  |  | x |  |  |  |
|  | 52 | Single Part M/C | E |  |  | x |  |  |  |
|  | 53 | Single Part M/C | E |  |  | x |  |  |  |
|  | 54 | Single Part M/C | E |  |  | x |  |  |  |
|  | 55 | Single Part M/C | E |  |  | x |  |  |  |
| CH11-Ref1 | 56-58 | Multipart M/C | E | x |  |  |  |  |  |
| CH11-Ref2 | 59-62 | Multipart M/C | M-H | x |  |  |  |  |  |
| CH11-Ref3 | 63-65 | Multipart M/C | E | x |  |  |  |  |  |
| CH11-Ref4 | 66-68 | Multipart M/C | E | x |  |  |  |  |  |
| CH11-Ref5 | 69-72 | Multipart M/C | E | x | x |  |  |  |  |
| CH11-Ref6 | 73-74 | Multipart M/C | M | x | x |  |  |  |  |
| CH11-Ref7 | 75-78 | Multipart M/C | E | x | x |  |  |  |  |
| CH11-Ref8 | 79-80 | Multipart M/C | M | x | x |  |  |  |  |
| CH11-Ref9 | 81-84 | Multipart M/C | E-H | x | x |  |  |  |  |
| CH11-Ref10 | 85-86 | Multipart M/C | M | x | x |  |  |  |  |
| CH11-Ref11 | 87-88 | Multipart M/C | E |  | x |  |  |  |  |
| CH11-Ref12 | 89-90 | Multipart M/C | E |  | x |  |  |  |  |
| CH11-Ref13 | 91-93 | Multipart M/C | E-M |  |  | x |  |  |  |
| CH11-Ref14 | 94-96 | Multipart M/C | E-M |  |  | x |  |  |  |
| CH11-Ref15 | 97-99 | Multipart M/C | E-H |  |  | x |  |  |  |
| CH11-Ref16 | 100-102 | Multipart M/C | E |  |  | x |  |  |  |
|  | 103 | Problem | E | x |  |  |  |  |  |
|  | 104 | Problem | E | x |  |  |  |  |  |
|  | 105 | Problem | H | x | x |  |  |  |  |
|  | 106 | Problem | H | x | x |  |  |  |  |
|  | 107 | Problem | E | x | x |  |  |  |  |
|  | 108 | Problem | E | x | x |  |  |  |  |
|  | 109 | Problem | E |  | x |  |  |  |  |
|  | 110 | Problem | E |  | x |  |  |  |  |
|  | 111 | Problem | E |  | x |  |  |  |  |
|  | 112 | Problem | M |  |  | x |  |  |  |
|  | 113 | Problem | H |  |  | x |  |  |  |
|  | 114 | Problem | E |  |  | x |  |  |  |
|  | 115 | Problem | E |  |  | x |  |  |  |

Chapter 11

Performance Measurement in Decentralized Organizations

**True / False Questions**

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| 1. | Land held for possible plant expansion would not be included as an operating asset when computing return on investment (ROI).    True    False |

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| 2. | When used in return on investment (ROI) calculations, operating assets do not include investments in land held for future use and investments in other companies.    True    False |

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| 3. | A disadvantage of using ROI to evaluate performance is that it encourages the manager to reduce the investment in operating assets as well as increase net operating income.    True    False |

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| 4. | Operating assets include cash, accounts receivable, and inventory but not any depreciable fixed assets.    True    False |

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| 5. | Return on investment (ROI) equals margin multiplied by turnover.    True    False |

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| 6. | All other things being the same, a decrease in average operating assets will decrease return on investment (ROI).    True    False |

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| 7. | Margin equals net operating income divided by sales.    True    False |

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| 8. | Net operating income is income after interest and taxes.    True    False |

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| 9. | Average operating assets is used in the numerator to compute turnover in an ROI analysis.    True    False |

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| 10. | Suppose a company evaluates divisional performance using both ROI and residual income. The company's minimum required rate of return for the purposes of residual income calculations is 12%. If a division has a residual income of $6,000, then its ROI is greater than 12%.    True    False |

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| 11. | Return on investment is superior to residual income as a means of measuring performance because it encourages managers to make investment decisions that are more consistent with the interests of the company as a whole.    True    False |

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| 12. | ROI and residual income are tools used to evaluate managerial performance in profit centers.    True    False |

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| 13. | Residual income is the net operating income that an investment center earns above the minimum required return on the investment in fixed assets.    True    False |

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| 14. | Residual income should not be used to evaluate a profit center.    True    False |

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| 15. | Process Time is the only non-value-added component of Throughput Time.    True    False |

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| 16. | Move time is considered value-added time.    True    False |

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| 17. | Queue time is considered value-added time.    True    False |

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| 18. | Wait time is considered non-value-added time.    True    False |

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| 19. | A manufacturing cycle efficiency (MCE) ratio close to 1.00 is desirable because this is the ratio of value-added time to throughput time.    True    False |

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| 20. | Inspection Time is generally considered to be non-value-added time.    True    False |

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| 21. | Throughput time is the amount of time required to process raw materials into completed products.    True    False |

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| 22. | Because continuous improvement is very difficult, the emphasis in the balanced scorecard tends to be on meeting preset standards.    True    False |

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| 23. | A balanced scorecard should not contain any performance measures concerning customer satisfaction since the extent to which customers are satisfied is beyond the control of any manager in the company.    True    False |

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| 24. | All profit centers are responsibility centers, but not all responsibility centers are profit centers.    True    False |

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| 25. | A profit center is responsible for generating revenue and for controlling costs.    True    False |

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| 26. | A cost center is not a responsibility center.    True    False |

**Multiple Choice Questions**

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| 27. | A company that is seeking to increase ROI should attempt to decrease:      |  |  | | --- | --- | | A. | sales. |  |  |  | | --- | --- | | B. | turnover. |  |  |  | | --- | --- | | C. | margin. |  |  |  | | --- | --- | | D. | average operating assets. | |

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| 28. | Consider the following three conditions:  I. An increase in sales II. An increase in operating assets III. A reduction in expenses  Which of the above conditions provide a way in which a manager can improve return on investment?      |  |  | | --- | --- | | A. | Only I |  |  |  | | --- | --- | | B. | Only I and II |  |  |  | | --- | --- | | C. | Only I and III |  |  |  | | --- | --- | | D. | Only II and III | |

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| 29. | Net operating income is defined as:      |  |  | | --- | --- | | A. | net income plus interest and taxes. |  |  |  | | --- | --- | | B. | sales minus variable expenses. |  |  |  | | --- | --- | | C. | sales minus variable expenses and traceable fixed expenses. |  |  |  | | --- | --- | | D. | contribution margin minus traceable and common fixed expenses. | |

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| 30. | Which of the following would be an argument for the use of net book value in the computation of operating assets in return on investment calculations?      |  |  | | --- | --- | | A. | It allows the manager to replace old, worn-out equipment with a minimum adverse impact on ROI. |  |  |  | | --- | --- | | B. | It allows ROI to decrease over time as assets get older. |  |  |  | | --- | --- | | C. | It is consistent with how plant and equipment items are reported on the balance sheet. |  |  |  | | --- | --- | | D. | It eliminates both age of equipment and method of depreciation as factors in ROI computations. | |

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| 31. | Managerial performance can be measured in many different ways including return on investment (ROI) and residual income. A good reason for using residual income instead of ROI is:      |  |  | | --- | --- | | A. | Residual income can be computed without having to measure operating assets. |  |  |  | | --- | --- | | B. | Managers are more likely to accept projects that are beneficial to the company. |  |  |  | | --- | --- | | C. | ROI does not take into account both turnover and margin. |  |  |  | | --- | --- | | D. | A minimum rate of return does not have to be specified when the residual income approach is used. | |

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| 32. | Which of the following performance measures will decrease if the minimum required rate of return increases?          |  |  | | --- | --- | | A. | Option A |  |  |  | | --- | --- | | B. | Option B |  |  |  | | --- | --- | | C. | Option C |  |  |  | | --- | --- | | D. | Option D | |

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| 33. | Residual income:      |  |  | | --- | --- | | A. | is the return on investment (ROI) percentage multiplied by average operating assets. |  |  |  | | --- | --- | | B. | is the net operating income earned above a certain minimum required return on sales. |  |  |  | | --- | --- | | C. | is the net operating income earned above a certain minimum required return on average operating assets. |  |  |  | | --- | --- | | D. | will always be greater than zero. | |

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| 34. | All other things being the same, which of the following would increase the residual income?      |  |  | | --- | --- | | A. | Decrease in average operating assets. |  |  |  | | --- | --- | | B. | Decrease in sales. |  |  |  | | --- | --- | | C. | Increase in minimum required return. |  |  |  | | --- | --- | | D. | Decrease in net operating income. | |

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| 35. | Throughput Time consists of:      |  |  | | --- | --- | | A. | Process Time. |  |  |  | | --- | --- | | B. | Inspection Time and Move Time. |  |  |  | | --- | --- | | C. | Process Time, Inspection Time, and Move Time. |  |  |  | | --- | --- | | D. | Process Time, Inspection Time, Move Time, and Queue Time. | |

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| 36. | Manufacturing Cycle Efficiency (MCE) is computed as:      |  |  | | --- | --- | | A. | Throughput Time ÷ Delivery Cycle Time. |  |  |  | | --- | --- | | B. | Process Time ÷ Delivery Cycle Time. |  |  |  | | --- | --- | | C. | Value-Added Time ÷ Throughput Time. |  |  |  | | --- | --- | | D. | Value-Added Time ÷ Delivery-Cycle Time. | |

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| 37. | Contribution income statements are used to measure the performance of:      |  |  | | --- | --- | | A. | cost centers. |  |  |  | | --- | --- | | B. | both cost centers and profit centers. |  |  |  | | --- | --- | | C. | both cost centers and investment centers. |  |  |  | | --- | --- | | D. | both profit centers and investment centers. | |

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| 38. | Given the following data:      Return on investment (ROI) would be:      |  |  | | --- | --- | | A. | 5% |  |  |  | | --- | --- | | B. | 12% |  |  |  | | --- | --- | | C. | 25% |  |  |  | | --- | --- | | D. | 60% | |

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| 39. | CS Company has a profit margin of 11%. Sales are $320,000, net operating income is $35,200, and average operating assets are $128,000. What is the company's return on investment (ROI)?      |  |  | | --- | --- | | A. | 2.5 |  |  |  | | --- | --- | | B. | 11% |  |  |  | | --- | --- | | C. | 27.5% |  |  |  | | --- | --- | | D. | 0.40 | |

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| 40. | Last year a company had sales of $400,000, a turnover of 2.4, and a return on investment of 36%. The company's net operating income for the year was:      |  |  | | --- | --- | | A. | $144,000 |  |  |  | | --- | --- | | B. | $120,000 |  |  |  | | --- | --- | | C. | $80,000 |  |  |  | | --- | --- | | D. | $60,000 | |

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| 41. | The following information relates to last year's operations at the Paper Division of Germane Corporation:      What was the Paper Division's net operating income last year?      |  |  | | --- | --- | | A. | $24,300 |  |  |  | | --- | --- | | B. | $29,160 |  |  |  | | --- | --- | | C. | $145,800 |  |  |  | | --- | --- | | D. | $162,000 | |

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| 42. | For the past year, Allargando Company recorded sales of $500,000 and average operating assets of $250,000. What is the margin that Allargando Company needed to earn in order to achieve an ROI of 12%?      |  |  | | --- | --- | | A. | 6.00% |  |  |  | | --- | --- | | B. | 12.00% |  |  |  | | --- | --- | | C. | 2.00% |  |  |  | | --- | --- | | D. | 8.33% | |

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| 43. | Chabot Company had the following results last year: net operating income, $2,160; turnover, 5; and ROI 18%. Chabot Company's average operating assets were:      |  |  | | --- | --- | | A. | $300,000 |  |  |  | | --- | --- | | B. | $60,000 |  |  |  | | --- | --- | | C. | $10,800 |  |  |  | | --- | --- | | D. | $12,000 | |

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| 44. | Given the following data:      The residual income would be:      |  |  | | --- | --- | | A. | $2,800 |  |  |  | | --- | --- | | B. | $0 |  |  |  | | --- | --- | | C. | $6,000 |  |  |  | | --- | --- | | D. | $8,000 | |

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| 45. | If operating income is $60,000, average operating assets are $240,000, and the minimum required rate of return is 20%, what is the residual income?      |  |  | | --- | --- | | A. | 40% |  |  |  | | --- | --- | | B. | 25% |  |  |  | | --- | --- | | C. | $12,000 |  |  |  | | --- | --- | | D. | $48,000 | |

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| 46. | The following information relates to last year's operations at the Bread Division of Rison Bakery, Inc.:      What was the Bread Division's minimum required rate of return last year?      |  |  | | --- | --- | | A. | 12% |  |  |  | | --- | --- | | B. | 4% |  |  |  | | --- | --- | | C. | 15% |  |  |  | | --- | --- | | D. | 20% | |

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| 47. | Koogle Corporation uses residual income to evaluate the performance of its divisions. The company's minimum required rate of return is 13%. In August, the Commercial Products Division had average operating assets of $530,000 and net operating income of $76,700. What was the Commercial Products Division's residual income in August?      |  |  | | --- | --- | | A. | -$9,971 |  |  |  | | --- | --- | | B. | -$7,800 |  |  |  | | --- | --- | | C. | $7,800 |  |  |  | | --- | --- | | D. | $9,971 | |

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| 48. | In September, the Universal Solutions Division of Mcallister Corporation had average operating assets of $120,000 and net operating income of $12,800. The company uses residual income, with a minimum required rate of return of 12%, to evaluate the performance of its divisions. What was the Universal Solutions Division's residual income in September?      |  |  | | --- | --- | | A. | -$1,600 |  |  |  | | --- | --- | | B. | $1,600 |  |  |  | | --- | --- | | C. | -$1,536 |  |  |  | | --- | --- | | D. | $1,536 | |

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| 49. | Fruchter Corporation keeps careful track of the time required to fill orders. The times recorded for a particular order appear below:      The throughput time was:      |  |  | | --- | --- | | A. | 4.6 hours |  |  |  | | --- | --- | | B. | 32.8 hours |  |  |  | | --- | --- | | C. | 11.0 hours |  |  |  | | --- | --- | | D. | 37.4 hours | |

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| 50. | Mccubbin Corporation keeps careful track of the time required to fill orders. The times recorded for a particular order appear below:      The delivery cycle time was:      |  |  | | --- | --- | | A. | 25.0 hours |  |  |  | | --- | --- | | B. | 13.1 hours |  |  |  | | --- | --- | | C. | 27.0 hours |  |  |  | | --- | --- | | D. | 3.5 hours | |

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| 51. | Garde Corporation keeps careful track of the time required to fill orders. Data concerning a particular order appear below:      The throughput time was:      |  |  | | --- | --- | | A. | 36.2 hours |  |  |  | | --- | --- | | B. | 8.1 hours |  |  |  | | --- | --- | | C. | 3.3 hours |  |  |  | | --- | --- | | D. | 32.9 hours | |

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| 52. | Nash Corporation manufactures and sells custom snowmobiles. From the time an order is placed till the time the snowmobile reaches the customer averages 50 days. This 50 days is spent as follows:      What is Nash's manufacturing cycle efficiency (MCE) for its snowmobiles?      |  |  | | --- | --- | | A. | 30.0% |  |  |  | | --- | --- | | B. | 37.5% |  |  |  | | --- | --- | | C. | 40.0% |  |  |  | | --- | --- | | D. | 60.0% | |

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| 53. | Emerich Corporation keeps careful track of the time required to fill orders. The times recorded for a particular order appear below:      The manufacturing cycle efficiency (MCE) was closest to:      |  |  | | --- | --- | | A. | 0.18 |  |  |  | | --- | --- | | B. | 0.09 |  |  |  | | --- | --- | | C. | 0.03 |  |  |  | | --- | --- | | D. | 0.49 | |

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| 54. | Brletich Corporation keeps careful track of the time required to fill orders. Data concerning a particular order appear below:      The delivery cycle time was:      |  |  | | --- | --- | | A. | 9.1 hours |  |  |  | | --- | --- | | B. | 21.1 hours |  |  |  | | --- | --- | | C. | 22.5 hours |  |  |  | | --- | --- | | D. | 3.7 hours | |

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| 55. | Ok Corporation keeps careful track of the time required to fill orders. Data concerning a particular order appear below:      The manufacturing cycle efficiency (MCE) was closest to:      |  |  | | --- | --- | | A. | 0.47 |  |  |  | | --- | --- | | B. | 0.02 |  |  |  | | --- | --- | | C. | 0.07 |  |  |  | | --- | --- | | D. | 0.12 | |

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|  | Aguilera Industries is a division of a major corporation. Data concerning the most recent year appears below: |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 56. | The division's margin is closest to:      |  |  | | --- | --- | | A. | 32.3% |  |  |  | | --- | --- | | B. | 25.0% |  |  |  | | --- | --- | | C. | 29.2% |  |  |  | | --- | --- | | D. | 7.3% | |

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| 57. | The division's turnover is closest to:      |  |  | | --- | --- | | A. | 3.10 |  |  |  | | --- | --- | | B. | 13.70 |  |  |  | | --- | --- | | C. | 4.00 |  |  |  | | --- | --- | | D. | 0.29 | |

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| 58. | The division's return on investment (ROI) is closest to:      |  |  | | --- | --- | | A. | 2.1% |  |  |  | | --- | --- | | B. | 29.2% |  |  |  | | --- | --- | | C. | 22.6% |  |  |  | | --- | --- | | D. | 5.8% | |

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|  | The Portland Division's operating data for the past two years is as follows:      The Portland Division's margin in Year 2 was 150% of the margin for Year 1. |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 59. | The net operating income for Year 1 was:      |  |  | | --- | --- | | A. | $192,000 |  |  |  | | --- | --- | | B. | $128,000 |  |  |  | | --- | --- | | C. | $266,667 |  |  |  | | --- | --- | | D. | $208,000 | |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 60. | The turnover for Year 1 was:      |  |  | | --- | --- | | A. | 10.00 |  |  |  | | --- | --- | | B. | 2.00 |  |  |  | | --- | --- | | C. | 1.50 |  |  |  | | --- | --- | | D. | 3.20 | |

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| 61. | The sales for Year 2 were:      |  |  | | --- | --- | | A. | $750,000 |  |  |  | | --- | --- | | B. | $2,000,000 |  |  |  | | --- | --- | | C. | $3,846,154 |  |  |  | | --- | --- | | D. | $2,400,000 | |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 62. | The average operating assets for Year 2 were:      |  |  | | --- | --- | | A. | $750,000 |  |  |  | | --- | --- | | B. | $400,000 |  |  |  | | --- | --- | | C. | $1,200,000 |  |  |  | | --- | --- | | D. | $800,000 | |

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|  | Last year the Uptown Division of Gorcen Enterprises had sales of $300,000 and a net operating income of $24,000. The average operating assets at Uptown last year amounted to $120,000. |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 63. | Last year at Uptown the margin used to calculate ROI amounted to:      |  |  | | --- | --- | | A. | 8% |  |  |  | | --- | --- | | B. | 12% |  |  |  | | --- | --- | | C. | 20% |  |  |  | | --- | --- | | D. | 40% | |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 64. | At Uptown the turnover used to calculate ROI last year was:      |  |  | | --- | --- | | A. | 0.4 |  |  |  | | --- | --- | | B. | 2.5 |  |  |  | | --- | --- | | C. | 3.2 |  |  |  | | --- | --- | | D. | 5.0 | |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 65. | Last year at Uptown the return on investment was:      |  |  | | --- | --- | | A. | 8% |  |  |  | | --- | --- | | B. | 12% |  |  |  | | --- | --- | | C. | 20% |  |  |  | | --- | --- | | D. | 40% | |

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|  | Baad Industries is a division of a major corporation. Last year the division had total sales of $20,440,000, net operating income of $1,860,040, and average operating assets of $7,000,000. |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 66. | The division's margin is closest to:      |  |  | | --- | --- | | A. | 9.1% |  |  |  | | --- | --- | | B. | 34.2% |  |  |  | | --- | --- | | C. | 26.6% |  |  |  | | --- | --- | | D. | 43.3% | |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 67. | The division's turnover is closest to:      |  |  | | --- | --- | | A. | 0.27 |  |  |  | | --- | --- | | B. | 2.92 |  |  |  | | --- | --- | | C. | 10.99 |  |  |  | | --- | --- | | D. | 2.31 | |

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| 68. | The division's return on investment (ROI) is closest to:      |  |  | | --- | --- | | A. | 21.0% |  |  |  | | --- | --- | | B. | 26.6% |  |  |  | | --- | --- | | C. | 6.8% |  |  |  | | --- | --- | | D. | 2.5% | |

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|  | Daab Products is a division of a major corporation. The following data are for the most recent year of operations: |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 69. | The division's margin used to compute ROI is closest to:      |  |  | | --- | --- | | A. | 2.8% |  |  |  | | --- | --- | | B. | 28.8% |  |  |  | | --- | --- | | C. | 10.8% |  |  |  | | --- | --- | | D. | 26.0% | |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 70. | The division's turnover used to compute ROI is closest to:      |  |  | | --- | --- | | A. | 3.84 |  |  |  | | --- | --- | | B. | 0.11 |  |  |  | | --- | --- | | C. | 35.71 |  |  |  | | --- | --- | | D. | 3.47 | |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 71. | The division's return on investment (ROI) is closest to:      |  |  | | --- | --- | | A. | 10.8% |  |  |  | | --- | --- | | B. | 41.5% |  |  |  | | --- | --- | | C. | 0.3% |  |  |  | | --- | --- | | D. | 2.2% | |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 72. | The division's residual income is closest to:      |  |  | | --- | --- | | A. | $322,560 |  |  |  | | --- | --- | | B. | $622,560 |  |  |  | | --- | --- | | C. | $(829,440) |  |  |  | | --- | --- | | D. | $22,560 | |

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| --- | --- |
|  | The following information relates to the Quilt Division of TDS Corporation for last year: |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 73. | What was the Quilt Division's return on investment (ROI) for last year?      |  |  | | --- | --- | | A. | 13% |  |  |  | | --- | --- | | B. | 18% |  |  |  | | --- | --- | | C. | 40% |  |  |  | | --- | --- | | D. | 45% | |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 74. | Assume that Quilt was being evaluated solely on the basis of residual income. Which of the following investment opportunities would Quilt want to invest in?          |  |  | | --- | --- | | A. | Option A |  |  |  | | --- | --- | | B. | Option B |  |  |  | | --- | --- | | C. | Option C |  |  |  | | --- | --- | | D. | Option D | |

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|  | Cabal Products is a division of a major corporation. Last year the division had total sales of $10,040,000, net operating income of $582,320, and average operating assets of $4,000,000. The company's minimum required rate of return is 14%. |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 75. | The division's margin is closest to:      |  |  | | --- | --- | | A. | 5.8% |  |  |  | | --- | --- | | B. | 45.6% |  |  |  | | --- | --- | | C. | 14.6% |  |  |  | | --- | --- | | D. | 39.8% | |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 76. | The division's turnover is closest to:      |  |  | | --- | --- | | A. | 2.19 |  |  |  | | --- | --- | | B. | 17.24 |  |  |  | | --- | --- | | C. | 0.15 |  |  |  | | --- | --- | | D. | 2.51 | |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 77. | The division's return on investment (ROI) is closest to:      |  |  | | --- | --- | | A. | 4.1% |  |  |  | | --- | --- | | B. | 14.6% |  |  |  | | --- | --- | | C. | 36.6% |  |  |  | | --- | --- | | D. | 0.9% | |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 78. | The division's residual income is closest to:      |  |  | | --- | --- | | A. | $582,320 |  |  |  | | --- | --- | | B. | $22,320 |  |  |  | | --- | --- | | C. | $(823,280) |  |  |  | | --- | --- | | D. | $1,142,320 | |

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| --- | --- |
|  | Brandon, Inc. has provided the following data for last year's operations: |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 79. | Brandon's residual income is:      |  |  | | --- | --- | | A. | $2,000 |  |  |  | | --- | --- | | B. | $4,000 |  |  |  | | --- | --- | | C. | $3,500 |  |  |  | | --- | --- | | D. | $2,500 | |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 80. | Brandon's return on investment (ROI) is:      |  |  | | --- | --- | | A. | 6% |  |  |  | | --- | --- | | B. | 10% |  |  |  | | --- | --- | | C. | 15% |  |  |  | | --- | --- | | D. | 24% | |

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|  | The Jenkins Division recorded operating data as follows for the past year: |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 81. | For the past year, the return on investment was:      |  |  | | --- | --- | | A. | 5% |  |  |  | | --- | --- | | B. | 15% |  |  |  | | --- | --- | | C. | 30% |  |  |  | | --- | --- | | D. | 25% | |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 82. | For the past year, the margin used in ROI calculations was:      |  |  | | --- | --- | | A. | 15% |  |  |  | | --- | --- | | B. | 8.33% |  |  |  | | --- | --- | | C. | 10% |  |  |  | | --- | --- | | D. | 5% | |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 83. | For the past year, the turnover used in ROI calculations was:      |  |  | | --- | --- | | A. | 4 |  |  |  | | --- | --- | | B. | 3 |  |  |  | | --- | --- | | C. | 2 |  |  |  | | --- | --- | | D. | 12 | |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 84. | For the past year, the minimum required rate of return was:      |  |  | | --- | --- | | A. | 7% |  |  |  | | --- | --- | | B. | 8% |  |  |  | | --- | --- | | C. | 16% |  |  |  | | --- | --- | | D. | 14% | |

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| --- | --- |
|  | The North Division of the Lyman Company reported the following data for last year: |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 85. | The residual income for the North Division last year was:      |  |  | | --- | --- | | A. | $130,000 |  |  |  | | --- | --- | | B. | $126,000 |  |  |  | | --- | --- | | C. | $90,000 |  |  |  | | --- | --- | | D. | $70,000 | |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 86. | The return on investment last year for the North Division was:      |  |  | | --- | --- | | A. | 18% |  |  |  | | --- | --- | | B. | 40% |  |  |  | | --- | --- | | C. | 36% |  |  |  | | --- | --- | | D. | 80% | |

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| --- | --- |
|  | The West Division of Frede Corporation had average operating assets of $700,000 and net operating income of $120,800 in December. The minimum required rate of return for performance evaluation purposes is 16%. |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 87. | What was the West Division's minimum required return in December?      |  |  | | --- | --- | | A. | $112,000 |  |  |  | | --- | --- | | B. | $120,800 |  |  |  | | --- | --- | | C. | $131,328 |  |  |  | | --- | --- | | D. | $19,328 | |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 88. | What was the West Division's residual income in December?      |  |  | | --- | --- | | A. | $8,800 |  |  |  | | --- | --- | | B. | $(19,328) |  |  |  | | --- | --- | | C. | $(8,800) |  |  |  | | --- | --- | | D. | $19,328 | |

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| --- | --- |
|  | The Consumer Products Division of Mickolick Corporation had average operating assets of $450,000 and net operating income of $38,700 in August. The minimum required rate of return for performance evaluation purposes is 10%. |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 89. | What was the Consumer Products Division's minimum required return in August?      |  |  | | --- | --- | | A. | $3,870 |  |  |  | | --- | --- | | B. | $38,700 |  |  |  | | --- | --- | | C. | $48,870 |  |  |  | | --- | --- | | D. | $45,000 | |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 90. | What was the Consumer Products Division's residual income in August?      |  |  | | --- | --- | | A. | $3,870 |  |  |  | | --- | --- | | B. | $6,300 |  |  |  | | --- | --- | | C. | $(3,870) |  |  |  | | --- | --- | | D. | $(6,300) | |

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| --- | --- |
|  | Ricric Corporation has provided the following data for one of its products: |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 91. | The throughput time for this operation is:      |  |  | | --- | --- | | A. | 8 days |  |  |  | | --- | --- | | B. | 3 days |  |  |  | | --- | --- | | C. | 17 days |  |  |  | | --- | --- | | D. | 7.7 days | |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 92. | The delivery cycle time for this operation is:      |  |  | | --- | --- | | A. | 8 days |  |  |  | | --- | --- | | B. | 17 days |  |  |  | | --- | --- | | C. | 9.3 days |  |  |  | | --- | --- | | D. | 7.7 days | |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 93. | The manufacturing cycle efficiency for this operation is closest to:      |  |  | | --- | --- | | A. | 0.375 |  |  |  | | --- | --- | | B. | 0.45 |  |  |  | | --- | --- | | C. | 0.18 |  |  |  | | --- | --- | | D. | 0.33 | |

|  |  |
| --- | --- |
|  | Ebsen Corporation keeps careful track of the time required to fill orders. Data concerning a particular order appear below: |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 94. | The throughput time was:      |  |  | | --- | --- | | A. | 30.5 hours |  |  |  | | --- | --- | | B. | 4.5 hours |  |  |  | | --- | --- | | C. | 13.9 hours |  |  |  | | --- | --- | | D. | 26 hours | |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 95. | The manufacturing cycle efficiency (MCE) was closest to:      |  |  | | --- | --- | | A. | 0.84 |  |  |  | | --- | --- | | B. | 0.04 |  |  |  | | --- | --- | | C. | 0.17 |  |  |  | | --- | --- | | D. | 0.09 | |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 96. | The delivery cycle time was:      |  |  | | --- | --- | | A. | 2.9 hours |  |  |  | | --- | --- | | B. | 12.3 hours |  |  |  | | --- | --- | | C. | 30.5 hours |  |  |  | | --- | --- | | D. | 28.9 hours | |

|  |  |
| --- | --- |
|  | The following data pertain to operations at Quick Incorporated: |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 97. | The wait time for this operation would be:      |  |  | | --- | --- | | A. | 4 hours |  |  |  | | --- | --- | | B. | 2 hours |  |  |  | | --- | --- | | C. | 8 hours |  |  |  | | --- | --- | | D. | cannot be determined from information provided | |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 98. | The combined inspection and move time for this operation would be:      |  |  | | --- | --- | | A. | 4 hours |  |  |  | | --- | --- | | B. | 1 hour |  |  |  | | --- | --- | | C. | 2 hours |  |  |  | | --- | --- | | D. | cannot be determined from information provided | |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 99. | The manufacturing cycle efficiency (MCE) for this operation would be:      |  |  | | --- | --- | | A. | 50% |  |  |  | | --- | --- | | B. | 75% |  |  |  | | --- | --- | | C. | 25% |  |  |  | | --- | --- | | D. | 12% | |

|  |  |
| --- | --- |
|  | Jolin Corporation keeps careful track of the time required to fill orders. The times recorded for a particular order appear below: |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 100. | The delivery cycle time was:      |  |  | | --- | --- | | A. | 11 hours |  |  |  | | --- | --- | | B. | 37.1 hours |  |  |  | | --- | --- | | C. | 2 hours |  |  |  | | --- | --- | | D. | 38.5 hours | |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 101. | The throughput time was:      |  |  | | --- | --- | | A. | 12.4 hours |  |  |  | | --- | --- | | B. | 35.1 hours |  |  |  | | --- | --- | | C. | 38.5 hours |  |  |  | | --- | --- | | D. | 3.4 hours | |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 102. | The manufacturing cycle efficiency (MCE) was closest to:      |  |  | | --- | --- | | A. | 0.03 |  |  |  | | --- | --- | | B. | 0.16 |  |  |  | | --- | --- | | C. | 0.10 |  |  |  | | --- | --- | | D. | 0.48 | |

**Essay Questions**

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| --- | --- |
| 103. | Handle Fabrication is a division of a major corporation. Last year the division had total sales of $36,160,000, net operating income of $2,892,800, and average operating assets of $8,000,000. The company's minimum required rate of return is 12%.  **Required:**  What is the division's return on investment (ROI)? |

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| 104. | Gaal Industries is a division of a major corporation. Last year the division had total sales of $26,110,000, net operating income of $1,801,590, and average operating assets of $7,000,000. The company's minimum required rate of return is 18%.  **Required:**  a. What is the division's margin? b. What is the division's turnover? c. What is the division's return on investment (ROI)? |

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| 105. | Financial data for Redstone Company for last year appear below:          The company paid dividends of $32,200 last year. The "Investment in Balsam Company" on the statement of financial position represents an investment in the stock of another company.  **Required:**  a. Compute the company's margin, turnover, and return on investment for last year. b. The Board of Directors of Redstone has set a minimum required return of 25%. What was the company's residual income last year? |

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| 106. | Guerlane Fragrance Corporation has a perfume division, Essense, and a cologne division, Karisma. The following information relates to last year's operations at each division. The minimum required rate of return is the same for both divisions.      **Required:**  Compute the unknown quantities above [(a) through (g)]. SHOW YOUR COMPUTATIONS. |

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| 107. | Faas Wares is a division of a major corporation. The following data are for the latest year of operations:      **Required:**  a. What is the division's return on investment (ROI)? b. What is the division's residual income? |

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| 108. | Eacher Wares is a division of a major corporation. The following data are for the latest year of operations:      **Required:**  a. What is the division's margin? b. What is the division's turnover? c. What is the division's return on investment (ROI)? d. What is the division's residual income? |

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| 109. | Hysong Corporation uses residual income to evaluate the performance of its divisions. The minimum required rate of return for performance evaluation purposes is 11%. The Games Division had average operating assets of $530,000 and net operating income of $56,200 in June.  **Required:**  What was the Games Division's residual income in June? |

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| 110. | Iba Industries is a division of a major corporation. The following data are for the latest year of operations:      **Required:**  What is the division's residual income? |

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| 111. | The Casket Division of Landazuri Corporation had average operating assets of $620,000 and net operating income of $86,000 in February. The company uses residual income to evaluate the performance of its divisions, with a minimum required rate of return of 14%.  **Required:**  What was the Casket Division's residual income in February? |

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| 112. | During the most recent month at Luinstra Corporation, queue time was 4.5 days, inspection time was 0.8 day, process time was 1.9 days, wait time was 5.1 days, and move time was 0.7 day.  **Required:**  a. Compute the throughput time. b. Compute the manufacturing cycle efficiency (MCE). c. What percentage of the production time is spent in non-value-added activities? d. Compute the delivery cycle time. |

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| 113. | Rintharamy Corporation's management reports that its average delivery cycle time is 25.2 days, its average throughput time is 7.6 days, its manufacturing cycle efficiency (MCE) is 0.25, its average move time is 0.9 day, and its average queue time is 4.0 days.  **Required:**  a. What is the wait time? b. What is the process time? c. What is the inspection time? |

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| 114. | Hardenburg Corporation keeps careful track of the time required to fill orders. The times required for a particular order appear below:      **Required:**  a. Determine the throughput time. Show your work! b. Determine the manufacturing cycle efficiency (MCE), Show your work! c. Determine the delivery cycle time. Show your work! |

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| 115. | Pardun Corporation's management keeps track of the time it takes to process orders. During the most recent month, the following average times were recorded per order:      **Required:**  a. Compute the throughput time. b. Compute the manufacturing cycle efficiency (MCE). c. What percentage of the production time is spent in non-value-added activities? d. Compute the delivery cycle time. |

Chapter 11 Performance Measurement in Decentralized Organizations Answer Key

**True / False Questions**

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| 1. | Land held for possible plant expansion would not be included as an operating asset when computing return on investment (ROI).    **TRUE** |

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| *AACSB: Reflective Thinking AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Understand Difficulty: 2 Medium Learning Objective: 11-01 Compute return on investment (ROI) and show how changes in sales; expenses; and assets affect ROI.* |

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| 2. | When used in return on investment (ROI) calculations, operating assets do not include investments in land held for future use and investments in other companies.    **TRUE** |

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| *AACSB: Reflective Thinking AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Understand Difficulty: 2 Medium Learning Objective: 11-01 Compute return on investment (ROI) and show how changes in sales; expenses; and assets affect ROI.* |

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| 3. | A disadvantage of using ROI to evaluate performance is that it encourages the manager to reduce the investment in operating assets as well as increase net operating income.    **FALSE** |

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| *AACSB: Reflective Thinking AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Understand Difficulty: 2 Medium Learning Objective: 11-01 Compute return on investment (ROI) and show how changes in sales; expenses; and assets affect ROI.* |

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| 4. | Operating assets include cash, accounts receivable, and inventory but not any depreciable fixed assets.    **FALSE** |

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| *AACSB: Reflective Thinking AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Understand Difficulty: 2 Medium Learning Objective: 11-01 Compute return on investment (ROI) and show how changes in sales; expenses; and assets affect ROI.* |

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| 5. | Return on investment (ROI) equals margin multiplied by turnover.    **TRUE** |

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| *AACSB: Reflective Thinking AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Remember Difficulty: 1 Easy Learning Objective: 11-01 Compute return on investment (ROI) and show how changes in sales; expenses; and assets affect ROI.* |

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| 6. | All other things being the same, a decrease in average operating assets will decrease return on investment (ROI).    **FALSE** |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Analyze Difficulty: 2 Medium Learning Objective: 11-01 Compute return on investment (ROI) and show how changes in sales; expenses; and assets affect ROI.* |

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| 7. | Margin equals net operating income divided by sales.    **FALSE** |

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| *AACSB: Reflective Thinking AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Remember Difficulty: 1 Easy Learning Objective: 11-01 Compute return on investment (ROI) and show how changes in sales; expenses; and assets affect ROI.* |

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| 8. | Net operating income is income after interest and taxes.    **FALSE** |

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| *AACSB: Reflective Thinking AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Understand Difficulty: 2 Medium Learning Objective: 11-01 Compute return on investment (ROI) and show how changes in sales; expenses; and assets affect ROI.* |

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| 9. | Average operating assets is used in the numerator to compute turnover in an ROI analysis.    **TRUE** |

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| *AACSB: Reflective Thinking AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Remember Difficulty: 1 Easy Learning Objective: 11-01 Compute return on investment (ROI) and show how changes in sales; expenses; and assets affect ROI.* |

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| 10. | Suppose a company evaluates divisional performance using both ROI and residual income. The company's minimum required rate of return for the purposes of residual income calculations is 12%. If a division has a residual income of $6,000, then its ROI is greater than 12%.    **TRUE** |

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| *AACSB: Reflective Thinking AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Understand Difficulty: 2 Medium Learning Objective: 11-01 Compute return on investment (ROI) and show how changes in sales; expenses; and assets affect ROI. Learning Objective: 11-02 Compute residual income and understand its strengths and weaknesses.* |

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| 11. | Return on investment is superior to residual income as a means of measuring performance because it encourages managers to make investment decisions that are more consistent with the interests of the company as a whole.    **FALSE** |

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| *AACSB: Reflective Thinking AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Remember Difficulty: 1 Easy Learning Objective: 11-01 Compute return on investment (ROI) and show how changes in sales; expenses; and assets affect ROI. Learning Objective: 11-02 Compute residual income and understand its strengths and weaknesses.* |

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| 12. | ROI and residual income are tools used to evaluate managerial performance in profit centers.    **FALSE** |

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| *AACSB: Reflective Thinking AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Understand Difficulty: 2 Medium Learning Objective: 11-01 Compute return on investment (ROI) and show how changes in sales; expenses; and assets affect ROI. Learning Objective: 11-02 Compute residual income and understand its strengths and weaknesses.* |

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| 13. | Residual income is the net operating income that an investment center earns above the minimum required return on the investment in fixed assets.    **FALSE** |

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| *AACSB: Reflective Thinking AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Understand Difficulty: 2 Medium Learning Objective: 11-02 Compute residual income and understand its strengths and weaknesses.* |

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| 14. | Residual income should not be used to evaluate a profit center.    **TRUE** |

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| *AACSB: Reflective Thinking AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Understand Difficulty: 2 Medium Learning Objective: 11-02 Compute residual income and understand its strengths and weaknesses.* |

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| 15. | Process Time is the only non-value-added component of Throughput Time.    **FALSE** |

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| *AACSB: Reflective Thinking AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Remember Difficulty: 1 Easy Learning Objective: 11-03 Compute delivery cycle time; throughput time; and manufacturing cycle efficiency (MCE).* |

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| 16. | Move time is considered value-added time.    **FALSE** |

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| *AACSB: Reflective Thinking AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Remember Difficulty: 1 Easy Learning Objective: 11-03 Compute delivery cycle time; throughput time; and manufacturing cycle efficiency (MCE).* |

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| 17. | Queue time is considered value-added time.    **FALSE** |

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| *AACSB: Reflective Thinking AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Remember Difficulty: 1 Easy Learning Objective: 11-03 Compute delivery cycle time; throughput time; and manufacturing cycle efficiency (MCE).* |

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| 18. | Wait time is considered non-value-added time.    **TRUE** |

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| *AACSB: Reflective Thinking AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Remember Difficulty: 1 Easy Learning Objective: 11-03 Compute delivery cycle time; throughput time; and manufacturing cycle efficiency (MCE).* |

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| 19. | A manufacturing cycle efficiency (MCE) ratio close to 1.00 is desirable because this is the ratio of value-added time to throughput time.    **TRUE** |

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| *AACSB: Reflective Thinking AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Understand Difficulty: 2 Medium Learning Objective: 11-03 Compute delivery cycle time; throughput time; and manufacturing cycle efficiency (MCE).* |

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| 20. | Inspection Time is generally considered to be non-value-added time.    **TRUE** |

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| *AACSB: Reflective Thinking AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Remember Difficulty: 1 Easy Learning Objective: 11-03 Compute delivery cycle time; throughput time; and manufacturing cycle efficiency (MCE).* |

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| 21. | Throughput time is the amount of time required to process raw materials into completed products.    **TRUE** |

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| *AACSB: Reflective Thinking AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Remember Difficulty: 1 Easy Learning Objective: 11-03 Compute delivery cycle time; throughput time; and manufacturing cycle efficiency (MCE).* |

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| 22. | Because continuous improvement is very difficult, the emphasis in the balanced scorecard tends to be on meeting preset standards.    **FALSE** |

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| *AACSB: Reflective Thinking AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Understand Difficulty: 2 Medium Learning Objective: 11-04 Understand how to construct and use a balanced scorecard.* |

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| 23. | A balanced scorecard should not contain any performance measures concerning customer satisfaction since the extent to which customers are satisfied is beyond the control of any manager in the company.    **FALSE** |

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| *AACSB: Reflective Thinking AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Understand Difficulty: 2 Medium Learning Objective: 11-04 Understand how to construct and use a balanced scorecard.* |

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| 24. | All profit centers are responsibility centers, but not all responsibility centers are profit centers.    **TRUE** |

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| *AACSB: Reflective Thinking AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Understand Difficulty: 2 Medium Learning Objective: Other topics* |

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| 25. | A profit center is responsible for generating revenue and for controlling costs.    **TRUE** |

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| *AACSB: Reflective Thinking AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Remember Difficulty: 1 Easy Learning Objective: Other topics* |

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| 26. | A cost center is not a responsibility center.    **FALSE** |

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| *AACSB: Reflective Thinking AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Remember Difficulty: 1 Easy Learning Objective: Other topics* |

**Multiple Choice Questions**

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| 27. | A company that is seeking to increase ROI should attempt to decrease:      |  |  | | --- | --- | | A. | sales. |  |  |  | | --- | --- | | B. | turnover. |  |  |  | | --- | --- | | C. | margin. |  |  |  | | --- | --- | | **D.** | average operating assets. | |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Analyze Difficulty: 2 Medium Learning Objective: 11-01 Compute return on investment (ROI) and show how changes in sales; expenses; and assets affect ROI.* |

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| 28. | Consider the following three conditions:  I. An increase in sales II. An increase in operating assets III. A reduction in expenses  Which of the above conditions provide a way in which a manager can improve return on investment?      |  |  | | --- | --- | | A. | Only I |  |  |  | | --- | --- | | B. | Only I and II |  |  |  | | --- | --- | | **C.** | Only I and III |  |  |  | | --- | --- | | D. | Only II and III | |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Analyze Difficulty: 2 Medium Learning Objective: 11-01 Compute return on investment (ROI) and show how changes in sales; expenses; and assets affect ROI.* |

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| 29. | Net operating income is defined as:      |  |  | | --- | --- | | **A.** | net income plus interest and taxes. |  |  |  | | --- | --- | | B. | sales minus variable expenses. |  |  |  | | --- | --- | | C. | sales minus variable expenses and traceable fixed expenses. |  |  |  | | --- | --- | | D. | contribution margin minus traceable and common fixed expenses. | |

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| *AACSB: Reflective Thinking AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Understand Difficulty: 2 Medium Learning Objective: 11-01 Compute return on investment (ROI) and show how changes in sales; expenses; and assets affect ROI.* |

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| 30. | Which of the following would be an argument for the use of net book value in the computation of operating assets in return on investment calculations?      |  |  | | --- | --- | | A. | It allows the manager to replace old, worn-out equipment with a minimum adverse impact on ROI. |  |  |  | | --- | --- | | B. | It allows ROI to decrease over time as assets get older. |  |  |  | | --- | --- | | **C.** | It is consistent with how plant and equipment items are reported on the balance sheet. |  |  |  | | --- | --- | | D. | It eliminates both age of equipment and method of depreciation as factors in ROI computations. | |

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| *AACSB: Reflective Thinking AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Understand Difficulty: 2 Medium Learning Objective: 11-01 Compute return on investment (ROI) and show how changes in sales; expenses; and assets affect ROI.* |

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| 31. | Managerial performance can be measured in many different ways including return on investment (ROI) and residual income. A good reason for using residual income instead of ROI is:      |  |  | | --- | --- | | A. | Residual income can be computed without having to measure operating assets. |  |  |  | | --- | --- | | **B.** | Managers are more likely to accept projects that are beneficial to the company. |  |  |  | | --- | --- | | C. | ROI does not take into account both turnover and margin. |  |  |  | | --- | --- | | D. | A minimum rate of return does not have to be specified when the residual income approach is used. | |

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| *AACSB: Reflective Thinking AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Understand Difficulty: 2 Medium Learning Objective: 11-01 Compute return on investment (ROI) and show how changes in sales; expenses; and assets affect ROI. Learning Objective: 11-02 Compute residual income and understand its strengths and weaknesses. Source: CMA, adapted* |

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| 32. | Which of the following performance measures will decrease if the minimum required rate of return increases?          |  |  | | --- | --- | | A. | Option A |  |  |  | | --- | --- | | **B.** | Option B |  |  |  | | --- | --- | | C. | Option C |  |  |  | | --- | --- | | D. | Option D | |

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| *AACSB: Reflective Thinking AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Understand Difficulty: 2 Medium Learning Objective: 11-01 Compute return on investment (ROI) and show how changes in sales; expenses; and assets affect ROI. Learning Objective: 11-02 Compute residual income and understand its strengths and weaknesses.* |

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| 33. | Residual income:      |  |  | | --- | --- | | A. | is the return on investment (ROI) percentage multiplied by average operating assets. |  |  |  | | --- | --- | | B. | is the net operating income earned above a certain minimum required return on sales. |  |  |  | | --- | --- | | **C.** | is the net operating income earned above a certain minimum required return on average operating assets. |  |  |  | | --- | --- | | D. | will always be greater than zero. | |

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| *AACSB: Reflective Thinking AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Understand Difficulty: 2 Medium Learning Objective: 11-02 Compute residual income and understand its strengths and weaknesses.* |

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| 34. | All other things being the same, which of the following would increase the residual income?      |  |  | | --- | --- | | **A.** | Decrease in average operating assets. |  |  |  | | --- | --- | | B. | Decrease in sales. |  |  |  | | --- | --- | | C. | Increase in minimum required return. |  |  |  | | --- | --- | | D. | Decrease in net operating income. | |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Analyze Difficulty: 2 Medium Learning Objective: 11-02 Compute residual income and understand its strengths and weaknesses.* |

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| 35. | Throughput Time consists of:      |  |  | | --- | --- | | A. | Process Time. |  |  |  | | --- | --- | | B. | Inspection Time and Move Time. |  |  |  | | --- | --- | | C. | Process Time, Inspection Time, and Move Time. |  |  |  | | --- | --- | | **D.** | Process Time, Inspection Time, Move Time, and Queue Time. | |

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| *AACSB: Reflective Thinking AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Remember Difficulty: 1 Easy Learning Objective: 11-03 Compute delivery cycle time; throughput time; and manufacturing cycle efficiency (MCE).* |

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| 36. | Manufacturing Cycle Efficiency (MCE) is computed as:      |  |  | | --- | --- | | A. | Throughput Time ÷ Delivery Cycle Time. |  |  |  | | --- | --- | | B. | Process Time ÷ Delivery Cycle Time. |  |  |  | | --- | --- | | **C.** | Value-Added Time ÷ Throughput Time. |  |  |  | | --- | --- | | D. | Value-Added Time ÷ Delivery-Cycle Time. | |

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| *AACSB: Reflective Thinking AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Remember Difficulty: 1 Easy Learning Objective: 11-03 Compute delivery cycle time; throughput time; and manufacturing cycle efficiency (MCE).* |

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| 37. | Contribution income statements are used to measure the performance of:      |  |  | | --- | --- | | A. | cost centers. |  |  |  | | --- | --- | | B. | both cost centers and profit centers. |  |  |  | | --- | --- | | C. | both cost centers and investment centers. |  |  |  | | --- | --- | | **D.** | both profit centers and investment centers. | |

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| *AACSB: Reflective Thinking AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Understand Difficulty: 2 Medium Learning Objective: Other topics* |

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| 38. | Given the following data:      Return on investment (ROI) would be:      |  |  | | --- | --- | | A. | 5% |  |  |  | | --- | --- | | **B.** | 12% |  |  |  | | --- | --- | | C. | 25% |  |  |  | | --- | --- | | D. | 60% |   ROI = Net operating income ÷ Average operating assets = $30,000 ÷ $250,000 = 12% |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 2 Medium Learning Objective: 11-01 Compute return on investment (ROI) and show how changes in sales; expenses; and assets affect ROI.* |

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| 39. | CS Company has a profit margin of 11%. Sales are $320,000, net operating income is $35,200, and average operating assets are $128,000. What is the company's return on investment (ROI)?      |  |  | | --- | --- | | A. | 2.5 |  |  |  | | --- | --- | | B. | 11% |  |  |  | | --- | --- | | **C.** | 27.5% |  |  |  | | --- | --- | | D. | 0.40 |   ROI = Net operating income ÷ Average operating assets = $35,200 ÷ $128,000 = 27.5% |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 2 Medium Learning Objective: 11-01 Compute return on investment (ROI) and show how changes in sales; expenses; and assets affect ROI.* |

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| 40. | Last year a company had sales of $400,000, a turnover of 2.4, and a return on investment of 36%. The company's net operating income for the year was:      |  |  | | --- | --- | | A. | $144,000 |  |  |  | | --- | --- | | B. | $120,000 |  |  |  | | --- | --- | | C. | $80,000 |  |  |  | | --- | --- | | **D.** | $60,000 |   ROI = Margin × Turnover 36% = Margin × 2.4 Margin = 36% ÷ 2.4 = 15%  Margin = Net operating income ÷ Sales 15% = Net operating income ÷ $400,000 Net operating income = 15% × $400,000 = $60,000 |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 3 Hard Learning Objective: 11-01 Compute return on investment (ROI) and show how changes in sales; expenses; and assets affect ROI.* |

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| 41. | The following information relates to last year's operations at the Paper Division of Germane Corporation:      What was the Paper Division's net operating income last year?      |  |  | | --- | --- | | A. | $24,300 |  |  |  | | --- | --- | | **B.** | $29,160 |  |  |  | | --- | --- | | C. | $145,800 |  |  |  | | --- | --- | | D. | $162,000 |   ROI = Margin × Turnover 18% = Margin × 5 Margin = 18% ÷ 5 = 3.6% Margin = Net operating income ÷ Sales 3.6% = Net operating income ÷ $810,000 Net operating income = 3.6% × $810,000 = $29,160 |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 3 Hard Learning Objective: 11-01 Compute return on investment (ROI) and show how changes in sales; expenses; and assets affect ROI.* |

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| 42. | For the past year, Allargando Company recorded sales of $500,000 and average operating assets of $250,000. What is the margin that Allargando Company needed to earn in order to achieve an ROI of 12%?      |  |  | | --- | --- | | **A.** | 6.00% |  |  |  | | --- | --- | | B. | 12.00% |  |  |  | | --- | --- | | C. | 2.00% |  |  |  | | --- | --- | | D. | 8.33% |   Turnover = Sales ÷ Average operating assets = $500,000 ÷ $250,000 = 2 ROI = Margin × Turnover 12% = Margin × 2 Margin = 12% ÷ 2 = 6% |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 3 Hard Learning Objective: 11-01 Compute return on investment (ROI) and show how changes in sales; expenses; and assets affect ROI.* |

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| 43. | Chabot Company had the following results last year: net operating income, $2,160; turnover, 5; and ROI 18%. Chabot Company's average operating assets were:      |  |  | | --- | --- | | A. | $300,000 |  |  |  | | --- | --- | | B. | $60,000 |  |  |  | | --- | --- | | C. | $10,800 |  |  |  | | --- | --- | | **D.** | $12,000 |   ROI = Net operating income ÷ Average operating assets 18% = $2,160 ÷ Average operating assets Average operating assets = $2,160 ÷ 18% = $12,000 |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 3 Hard Learning Objective: 11-01 Compute return on investment (ROI) and show how changes in sales; expenses; and assets affect ROI.* |

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| 44. | Given the following data:      The residual income would be:      |  |  | | --- | --- | | **A.** | $2,800 |  |  |  | | --- | --- | | B. | $0 |  |  |  | | --- | --- | | C. | $6,000 |  |  |  | | --- | --- | | D. | $8,000 |   Margin = Net operating income ÷ Sales 0.10 = Net operating income ÷ $100,000 Net operating income = 0.10 × $100,000 = $10,000  Residual income = Net operating income - (Average operating assets × Minimum required rate of return) = $10,000 - ($40,000 × 0.18) = $10,000 - $7,200 = $2,800 |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 2 Medium Learning Objective: 11-01 Compute return on investment (ROI) and show how changes in sales; expenses; and assets affect ROI. Learning Objective: 11-02 Compute residual income and understand its strengths and weaknesses.* |

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| 45. | If operating income is $60,000, average operating assets are $240,000, and the minimum required rate of return is 20%, what is the residual income?      |  |  | | --- | --- | | A. | 40% |  |  |  | | --- | --- | | B. | 25% |  |  |  | | --- | --- | | **C.** | $12,000 |  |  |  | | --- | --- | | D. | $48,000 | |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 1 Easy Learning Objective: 11-02 Compute residual income and understand its strengths and weaknesses.* |

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| 46. | The following information relates to last year's operations at the Bread Division of Rison Bakery, Inc.:      What was the Bread Division's minimum required rate of return last year?      |  |  | | --- | --- | | **A.** | 12% |  |  |  | | --- | --- | | B. | 4% |  |  |  | | --- | --- | | C. | 15% |  |  |  | | --- | --- | | D. | 20% |   Residual income = Net operating income - (Average operating assets × Minimum required rate of return) $12,000 = $60,000 - ($400,000 × Minimum required rate of return) $400,000 × Minimum required rate of return = $60,000 - $12,000 $400,000 × Minimum required rate of return = $48,000 Minimum required rate of return = $48,000 ÷ $400,000 = 12% |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 3 Hard Learning Objective: 11-02 Compute residual income and understand its strengths and weaknesses.* |

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| 47. | Koogle Corporation uses residual income to evaluate the performance of its divisions. The company's minimum required rate of return is 13%. In August, the Commercial Products Division had average operating assets of $530,000 and net operating income of $76,700. What was the Commercial Products Division's residual income in August?      |  |  | | --- | --- | | A. | -$9,971 |  |  |  | | --- | --- | | B. | -$7,800 |  |  |  | | --- | --- | | **C.** | $7,800 |  |  |  | | --- | --- | | D. | $9,971 | |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 1 Easy Learning Objective: 11-02 Compute residual income and understand its strengths and weaknesses.* |

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| 48. | In September, the Universal Solutions Division of Mcallister Corporation had average operating assets of $120,000 and net operating income of $12,800. The company uses residual income, with a minimum required rate of return of 12%, to evaluate the performance of its divisions. What was the Universal Solutions Division's residual income in September?      |  |  | | --- | --- | | **A.** | -$1,600 |  |  |  | | --- | --- | | B. | $1,600 |  |  |  | | --- | --- | | C. | -$1,536 |  |  |  | | --- | --- | | D. | $1,536 | |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 1 Easy Learning Objective: 11-02 Compute residual income and understand its strengths and weaknesses.* |

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| 49. | Fruchter Corporation keeps careful track of the time required to fill orders. The times recorded for a particular order appear below:      The throughput time was:      |  |  | | --- | --- | | A. | 4.6 hours |  |  |  | | --- | --- | | B. | 32.8 hours |  |  |  | | --- | --- | | **C.** | 11.0 hours |  |  |  | | --- | --- | | D. | 37.4 hours |   Throughput time = Process time + Inspection time + Move time + Queue time = 1.8 hours + 0.1 hours + 2.7 hours + 6.4 hours = 11.0 hours |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 1 Easy Learning Objective: 11-03 Compute delivery cycle time; throughput time; and manufacturing cycle efficiency (MCE).* |

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| 50. | Mccubbin Corporation keeps careful track of the time required to fill orders. The times recorded for a particular order appear below:      The delivery cycle time was:      |  |  | | --- | --- | | A. | 25.0 hours |  |  |  | | --- | --- | | B. | 13.1 hours |  |  |  | | --- | --- | | **C.** | 27.0 hours |  |  |  | | --- | --- | | D. | 3.5 hours |   Throughput time = Process time + Inspection time + Move time + Queue time = 1.7 hours + 0.3 hours + 3.5 hours + 9.6 hours = 15.1 hours  Delivery cycle time = Wait time + Throughput time = 11.9 hours + 15.1 hours = 27.0 hours |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 1 Easy Learning Objective: 11-03 Compute delivery cycle time; throughput time; and manufacturing cycle efficiency (MCE).* |

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| 51. | Garde Corporation keeps careful track of the time required to fill orders. Data concerning a particular order appear below:      The throughput time was:      |  |  | | --- | --- | | A. | 36.2 hours |  |  |  | | --- | --- | | **B.** | 8.1 hours |  |  |  | | --- | --- | | C. | 3.3 hours |  |  |  | | --- | --- | | D. | 32.9 hours |   Throughput time = Process time + Inspection time + Move time + Queue time = 0.5 hours + 0.4 hours + 2.4 hours + 4.8 hours = 8.1 hours |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 1 Easy Learning Objective: 11-03 Compute delivery cycle time; throughput time; and manufacturing cycle efficiency (MCE).* |

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| 52. | Nash Corporation manufactures and sells custom snowmobiles. From the time an order is placed till the time the snowmobile reaches the customer averages 50 days. This 50 days is spent as follows:      What is Nash's manufacturing cycle efficiency (MCE) for its snowmobiles?      |  |  | | --- | --- | | A. | 30.0% |  |  |  | | --- | --- | | **B.** | 37.5% |  |  |  | | --- | --- | | C. | 40.0% |  |  |  | | --- | --- | | D. | 60.0% |   Throughput time = Process time + Inspection time + Move time + Queue time = 15 days + 5 days + 5 days + 15 days = 40 days MCE = Value-added time (Process time) ÷ Throughput (manufacturing cycle) time = 15 days ÷ 40 days = 37.5% |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 1 Easy Learning Objective: 11-03 Compute delivery cycle time; throughput time; and manufacturing cycle efficiency (MCE).* |

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| 53. | Emerich Corporation keeps careful track of the time required to fill orders. The times recorded for a particular order appear below:      The manufacturing cycle efficiency (MCE) was closest to:      |  |  | | --- | --- | | A. | 0.18 |  |  |  | | --- | --- | | **B.** | 0.09 |  |  |  | | --- | --- | | C. | 0.03 |  |  |  | | --- | --- | | D. | 0.49 |   Throughput time = Process time + Inspection time + Move time + Queue time = 1.1 hours + 0.4 hours + 3.9 hours + 6.3 hours = 11.7 hours  MCE = Value-added time (Process time) ÷ Throughput (manufacturing cycle) time = 1.1 hours ÷ 11.7 hours = 0.09 |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 1 Easy Learning Objective: 11-03 Compute delivery cycle time; throughput time; and manufacturing cycle efficiency (MCE).* |

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| 54. | Brletich Corporation keeps careful track of the time required to fill orders. Data concerning a particular order appear below:      The delivery cycle time was:      |  |  | | --- | --- | | A. | 9.1 hours |  |  |  | | --- | --- | | B. | 21.1 hours |  |  |  | | --- | --- | | **C.** | 22.5 hours |  |  |  | | --- | --- | | D. | 3.7 hours |   Throughput time = Process time + Inspection time + Move time + Queue time = 1.1 hours + 0.3 hours + 3.7 hours + 5.4 hours = 10.5 hours  Delivery cycle time = Wait time + Throughput time = 12.0 hours + 10.5 hours = 22.5 hours |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 1 Easy Learning Objective: 11-03 Compute delivery cycle time; throughput time; and manufacturing cycle efficiency (MCE).* |

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| 55. | Ok Corporation keeps careful track of the time required to fill orders. Data concerning a particular order appear below:      The manufacturing cycle efficiency (MCE) was closest to:      |  |  | | --- | --- | | A. | 0.47 |  |  |  | | --- | --- | | B. | 0.02 |  |  |  | | --- | --- | | **C.** | 0.07 |  |  |  | | --- | --- | | D. | 0.12 |   Throughput time = Process time + Inspection time + Move time + Queue time = 0.8 hours + 0.1 hours + 3.1 hours + 7.5 hours = 11.5 hours  MCE = Value-added time (Process time) ÷ Throughput (manufacturing cycle) time = 0.8 hours ÷ 11.5 hours = 0.07 |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 1 Easy Learning Objective: 11-03 Compute delivery cycle time; throughput time; and manufacturing cycle efficiency (MCE).* |

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|  | Aguilera Industries is a division of a major corporation. Data concerning the most recent year appears below: |

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| 56. | The division's margin is closest to:      |  |  | | --- | --- | | A. | 32.3% |  |  |  | | --- | --- | | B. | 25.0% |  |  |  | | --- | --- | | C. | 29.2% |  |  |  | | --- | --- | | **D.** | 7.3% |   Margin = Net operating income ÷ Sales = $1,752,000 ÷ $24,000,000 = 7.3% |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 1 Easy Learning Objective: 11-01 Compute return on investment (ROI) and show how changes in sales; expenses; and assets affect ROI.* |

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| 57. | The division's turnover is closest to:      |  |  | | --- | --- | | A. | 3.10 |  |  |  | | --- | --- | | B. | 13.70 |  |  |  | | --- | --- | | **C.** | 4.00 |  |  |  | | --- | --- | | D. | 0.29 |   Turnover = Sales ÷ Average operating assets = $24,000,000 ÷ $6,000,000 = 4 |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 1 Easy Learning Objective: 11-01 Compute return on investment (ROI) and show how changes in sales; expenses; and assets affect ROI.* |

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| 58. | The division's return on investment (ROI) is closest to:      |  |  | | --- | --- | | A. | 2.1% |  |  |  | | --- | --- | | **B.** | 29.2% |  |  |  | | --- | --- | | C. | 22.6% |  |  |  | | --- | --- | | D. | 5.8% |   ROI = Net operating income ÷ Average operating assets = $1,752,000 ÷ $6,000,000 = 29.2% |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 1 Easy Learning Objective: 11-01 Compute return on investment (ROI) and show how changes in sales; expenses; and assets affect ROI.* |

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|  | The Portland Division's operating data for the past two years is as follows:      The Portland Division's margin in Year 2 was 150% of the margin for Year 1. |

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| 59. | The net operating income for Year 1 was:      |  |  | | --- | --- | | A. | $192,000 |  |  |  | | --- | --- | | **B.** | $128,000 |  |  |  | | --- | --- | | C. | $266,667 |  |  |  | | --- | --- | | D. | $208,000 |   Year 2 ROI = Year 2 Margin × Year 2 Turnover 24% = Year 2 Margin × 2 Year 2 Margin = 24% ÷ 2 = 12%  Year 2 Margin = 150% × Year 1 Margin 12% = 150% × Year 1 Margin Year 1 Margin = 12% ÷ 150% = 8% Year 1 Margin = Year 1 Net operating income ÷ Year 1 Sales 8% = Year 1 Net operating income ÷ $1,600,000 Year 1 Net operating income = 8% × $1,600,000 = $128,000 |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 3 Hard Learning Objective: 11-01 Compute return on investment (ROI) and show how changes in sales; expenses; and assets affect ROI.* |

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| 60. | The turnover for Year 1 was:      |  |  | | --- | --- | | A. | 10.00 |  |  |  | | --- | --- | | B. | 2.00 |  |  |  | | --- | --- | | **C.** | 1.50 |  |  |  | | --- | --- | | D. | 3.20 |   Year 2 ROI = Year 2 Margin × Year 2 Turnover 24% = Year 2 Margin × 2 Year 2 Margin = 24% ÷ 2 = 12%  Year 2 Margin = 150% × Year 1 Margin 12% = 150% × Year 1 Margin Year 1 Margin = 12% ÷ 150% = 8%  Year 1 ROI = Year 1 Margin × Year 1 Turnover 12% = 8% × Year 1 Turnover Year 1 Turnover = 12% ÷ 8% = 1.5 |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 3 Hard Learning Objective: 11-01 Compute return on investment (ROI) and show how changes in sales; expenses; and assets affect ROI.* |

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| 61. | The sales for Year 2 were:      |  |  | | --- | --- | | A. | $750,000 |  |  |  | | --- | --- | | B. | $2,000,000 |  |  |  | | --- | --- | | C. | $3,846,154 |  |  |  | | --- | --- | | **D.** | $2,400,000 |   Year 2 ROI = Year 2 Margin × Year 2 Turnover 24% = Year 2 Margin × 2 Year 2 Margin = 24% ÷ 2 = 12%  Year 2 Margin = Year 2 Net operating income ÷ Year 2 Sales 12% = $288,000 ÷ Year 2 Sales Year 2 Sales = $288,000 ÷ 12% = $2,400,000 |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 3 Hard Learning Objective: 11-01 Compute return on investment (ROI) and show how changes in sales; expenses; and assets affect ROI.* |

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| 62. | The average operating assets for Year 2 were:      |  |  | | --- | --- | | A. | $750,000 |  |  |  | | --- | --- | | B. | $400,000 |  |  |  | | --- | --- | | **C.** | $1,200,000 |  |  |  | | --- | --- | | D. | $800,000 |   Year 2 ROI = Year 2 Net operating income ÷ Year 2 Average operating assets 24% = $288,000 ÷ Year 2 Average operating assets Year 2 Average operating assets = $288,000 ÷ 24% = $1,200,000 |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 2 Medium Learning Objective: 11-01 Compute return on investment (ROI) and show how changes in sales; expenses; and assets affect ROI.* |

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|  | Last year the Uptown Division of Gorcen Enterprises had sales of $300,000 and a net operating income of $24,000. The average operating assets at Uptown last year amounted to $120,000. |

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| 63. | Last year at Uptown the margin used to calculate ROI amounted to:      |  |  | | --- | --- | | **A.** | 8% |  |  |  | | --- | --- | | B. | 12% |  |  |  | | --- | --- | | C. | 20% |  |  |  | | --- | --- | | D. | 40% |   Margin = Net operating income ÷ Sales = $24,000 ÷ $300,000 = 8% |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 1 Easy Learning Objective: 11-01 Compute return on investment (ROI) and show how changes in sales; expenses; and assets affect ROI.* |

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| 64. | At Uptown the turnover used to calculate ROI last year was:      |  |  | | --- | --- | | A. | 0.4 |  |  |  | | --- | --- | | **B.** | 2.5 |  |  |  | | --- | --- | | C. | 3.2 |  |  |  | | --- | --- | | D. | 5.0 |   Turnover = Sales ÷ Average operating assets = $300,000 ÷ $120,000 = 2.5 |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 1 Easy Learning Objective: 11-01 Compute return on investment (ROI) and show how changes in sales; expenses; and assets affect ROI.* |

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| 65. | Last year at Uptown the return on investment was:      |  |  | | --- | --- | | A. | 8% |  |  |  | | --- | --- | | B. | 12% |  |  |  | | --- | --- | | **C.** | 20% |  |  |  | | --- | --- | | D. | 40% |   ROI = Net operating income ÷ Average operating assets = $24,000 ÷ $120,000 = 20% |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 1 Easy Learning Objective: 11-01 Compute return on investment (ROI) and show how changes in sales; expenses; and assets affect ROI.* |

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|  | Baad Industries is a division of a major corporation. Last year the division had total sales of $20,440,000, net operating income of $1,860,040, and average operating assets of $7,000,000. |

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| 66. | The division's margin is closest to:      |  |  | | --- | --- | | **A.** | 9.1% |  |  |  | | --- | --- | | B. | 34.2% |  |  |  | | --- | --- | | C. | 26.6% |  |  |  | | --- | --- | | D. | 43.3% |   Margin = Net operating income ÷ Sales = $1,860,040 ÷ $20,440,000 = 9.1% |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 1 Easy Learning Objective: 11-01 Compute return on investment (ROI) and show how changes in sales; expenses; and assets affect ROI.* |

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| 67. | The division's turnover is closest to:      |  |  | | --- | --- | | A. | 0.27 |  |  |  | | --- | --- | | **B.** | 2.92 |  |  |  | | --- | --- | | C. | 10.99 |  |  |  | | --- | --- | | D. | 2.31 |   Turnover = Sales ÷ Average operating assets = $20,440,000 ÷ $7,000,000 = 2.92 |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 1 Easy Learning Objective: 11-01 Compute return on investment (ROI) and show how changes in sales; expenses; and assets affect ROI.* |

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| 68. | The division's return on investment (ROI) is closest to:      |  |  | | --- | --- | | A. | 21.0% |  |  |  | | --- | --- | | **B.** | 26.6% |  |  |  | | --- | --- | | C. | 6.8% |  |  |  | | --- | --- | | D. | 2.5% |   ROI = Net operating income ÷ Average operating assets = $1,860,040 ÷ $7,000,000 = 26.572% |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 1 Easy Learning Objective: 11-01 Compute return on investment (ROI) and show how changes in sales; expenses; and assets affect ROI.* |

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|  | Daab Products is a division of a major corporation. The following data are for the most recent year of operations: |

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| 69. | The division's margin used to compute ROI is closest to:      |  |  | | --- | --- | | **A.** | 2.8% |  |  |  | | --- | --- | | B. | 28.8% |  |  |  | | --- | --- | | C. | 10.8% |  |  |  | | --- | --- | | D. | 26.0% |   Margin = Net operating income ÷ Sales = $322,560 ÷ $11,520,000 = 2.8% |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 1 Easy Learning Objective: 11-01 Compute return on investment (ROI) and show how changes in sales; expenses; and assets affect ROI.* |

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| 70. | The division's turnover used to compute ROI is closest to:      |  |  | | --- | --- | | **A.** | 3.84 |  |  |  | | --- | --- | | B. | 0.11 |  |  |  | | --- | --- | | C. | 35.71 |  |  |  | | --- | --- | | D. | 3.47 |   Turnover = Sales ÷ Average operating assets = $11,520,000 ÷ $3,000,000 = 3.84 |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 1 Easy Learning Objective: 11-01 Compute return on investment (ROI) and show how changes in sales; expenses; and assets affect ROI.* |

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| 71. | The division's return on investment (ROI) is closest to:      |  |  | | --- | --- | | **A.** | 10.8% |  |  |  | | --- | --- | | B. | 41.5% |  |  |  | | --- | --- | | C. | 0.3% |  |  |  | | --- | --- | | D. | 2.2% |   ROI = Net operating income ÷ Average operating assets = $322,560 ÷ $3,000,000 = 10.752% |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 1 Easy Learning Objective: 11-01 Compute return on investment (ROI) and show how changes in sales; expenses; and assets affect ROI.* |

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| 72. | The division's residual income is closest to:      |  |  | | --- | --- | | A. | $322,560 |  |  |  | | --- | --- | | B. | $622,560 |  |  |  | | --- | --- | | C. | $(829,440) |  |  |  | | --- | --- | | **D.** | $22,560 | |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 1 Easy Learning Objective: 11-02 Compute residual income and understand its strengths and weaknesses.* |

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|  | The following information relates to the Quilt Division of TDS Corporation for last year: |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 73. | What was the Quilt Division's return on investment (ROI) for last year?      |  |  | | --- | --- | | **A.** | 13% |  |  |  | | --- | --- | | B. | 18% |  |  |  | | --- | --- | | C. | 40% |  |  |  | | --- | --- | | D. | 45% |   ROI = Net operating income ÷ Average operating assets = $65,000 ÷ $500,000 = 13% |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 2 Medium Learning Objective: 11-01 Compute return on investment (ROI) and show how changes in sales; expenses; and assets affect ROI.* |

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| 74. | Assume that Quilt was being evaluated solely on the basis of residual income. Which of the following investment opportunities would Quilt want to invest in?          |  |  | | --- | --- | | **A.** | Option A |  |  |  | | --- | --- | | B. | Option B |  |  |  | | --- | --- | | C. | Option C |  |  |  | | --- | --- | | D. | Option D |   The Quilt Division's residual income would increase if either investment opportunity were accepted because the rates of returns on the projects exceed the minimum required rate of return. |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Evaluate Difficulty: 2 Medium Learning Objective: 11-01 Compute return on investment (ROI) and show how changes in sales; expenses; and assets affect ROI. Learning Objective: 11-02 Compute residual income and understand its strengths and weaknesses.* |

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|  | Cabal Products is a division of a major corporation. Last year the division had total sales of $10,040,000, net operating income of $582,320, and average operating assets of $4,000,000. The company's minimum required rate of return is 14%. |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 75. | The division's margin is closest to:      |  |  | | --- | --- | | **A.** | 5.8% |  |  |  | | --- | --- | | B. | 45.6% |  |  |  | | --- | --- | | C. | 14.6% |  |  |  | | --- | --- | | D. | 39.8% |   Margin = Net operating income ÷ Sales = $582,320 ÷ $10,040,000 = 5.8% |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 1 Easy Learning Objective: 11-01 Compute return on investment (ROI) and show how changes in sales; expenses; and assets affect ROI. Learning Objective: 11-02 Compute residual income and understand its strengths and weaknesses.* |

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| 76. | The division's turnover is closest to:      |  |  | | --- | --- | | A. | 2.19 |  |  |  | | --- | --- | | B. | 17.24 |  |  |  | | --- | --- | | C. | 0.15 |  |  |  | | --- | --- | | **D.** | 2.51 |   Turnover = Sales ÷ Average operating assets = $10,040,000 ÷ $4,000,000 = 2.51 |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 1 Easy Learning Objective: 11-01 Compute return on investment (ROI) and show how changes in sales; expenses; and assets affect ROI. Learning Objective: 11-02 Compute residual income and understand its strengths and weaknesses.* |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 77. | The division's return on investment (ROI) is closest to:      |  |  | | --- | --- | | A. | 4.1% |  |  |  | | --- | --- | | **B.** | 14.6% |  |  |  | | --- | --- | | C. | 36.6% |  |  |  | | --- | --- | | D. | 0.9% |   ROI = Net operating income ÷ Average operating assets = $582,320 ÷ $4,000,000 = 14.558% |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 1 Easy Learning Objective: 11-01 Compute return on investment (ROI) and show how changes in sales; expenses; and assets affect ROI. Learning Objective: 11-02 Compute residual income and understand its strengths and weaknesses.* |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 78. | The division's residual income is closest to:      |  |  | | --- | --- | | A. | $582,320 |  |  |  | | --- | --- | | **B.** | $22,320 |  |  |  | | --- | --- | | C. | $(823,280) |  |  |  | | --- | --- | | D. | $1,142,320 | |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 1 Easy Learning Objective: 11-01 Compute return on investment (ROI) and show how changes in sales; expenses; and assets affect ROI. Learning Objective: 11-02 Compute residual income and understand its strengths and weaknesses.* |

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|  | Brandon, Inc. has provided the following data for last year's operations: |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 79. | Brandon's residual income is:      |  |  | | --- | --- | | **A.** | $2,000 |  |  |  | | --- | --- | | B. | $4,000 |  |  |  | | --- | --- | | C. | $3,500 |  |  |  | | --- | --- | | D. | $2,500 |   Residual income = Net operating income - (Average operating assets × Minimum required rate of return) = $6,000 ÷ ($40,000 × 10%) = $2,000 |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 2 Medium Learning Objective: 11-02 Compute residual income and understand its strengths and weaknesses.* |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 80. | Brandon's return on investment (ROI) is:      |  |  | | --- | --- | | A. | 6% |  |  |  | | --- | --- | | B. | 10% |  |  |  | | --- | --- | | **C.** | 15% |  |  |  | | --- | --- | | D. | 24% |   ROI = Net operating income ÷ Average operating assets = $6,000 ÷ $40,000 = 15% |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 2 Medium Learning Objective: 11-01 Compute return on investment (ROI) and show how changes in sales; expenses; and assets affect ROI.* |

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|  | The Jenkins Division recorded operating data as follows for the past year: |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 81. | For the past year, the return on investment was:      |  |  | | --- | --- | | A. | 5% |  |  |  | | --- | --- | | **B.** | 15% |  |  |  | | --- | --- | | C. | 30% |  |  |  | | --- | --- | | D. | 25% |   ROI = Net operating income ÷ Average operating assets = $30,000 ÷ $200,000 = 15% |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 2 Medium Learning Objective: 11-01 Compute return on investment (ROI) and show how changes in sales; expenses; and assets affect ROI.* |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 82. | For the past year, the margin used in ROI calculations was:      |  |  | | --- | --- | | A. | 15% |  |  |  | | --- | --- | | B. | 8.33% |  |  |  | | --- | --- | | C. | 10% |  |  |  | | --- | --- | | **D.** | 5% |   Margin = Net operating income ÷ Sales = $30,000 ÷ $600,000 = 5% |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 1 Easy Learning Objective: 11-01 Compute return on investment (ROI) and show how changes in sales; expenses; and assets affect ROI.* |

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| 83. | For the past year, the turnover used in ROI calculations was:      |  |  | | --- | --- | | A. | 4 |  |  |  | | --- | --- | | **B.** | 3 |  |  |  | | --- | --- | | C. | 2 |  |  |  | | --- | --- | | D. | 12 |   Turnover = Sales ÷ Average operating assets = $600,000 ÷ $200,000 = 3 |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 2 Medium Learning Objective: 11-01 Compute return on investment (ROI) and show how changes in sales; expenses; and assets affect ROI.* |

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| 84. | For the past year, the minimum required rate of return was:      |  |  | | --- | --- | | A. | 7% |  |  |  | | --- | --- | | **B.** | 8% |  |  |  | | --- | --- | | C. | 16% |  |  |  | | --- | --- | | D. | 14% |   Residual income = Net operating income - (Average operating assets × Minimum required rate of return) $14,000 = $30,000 - ($200,000 × Minimum required rate of return) $200,000 × Minimum required rate of return = $30,000 - $14,000 $200,000 × Minimum required rate of return = $16,000 Minimum required rate of return = $16,000 ÷ $200,000 = 8% |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 3 Hard Learning Objective: 11-02 Compute residual income and understand its strengths and weaknesses.* |

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|  | The North Division of the Lyman Company reported the following data for last year: |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 85. | The residual income for the North Division last year was:      |  |  | | --- | --- | | **A.** | $130,000 |  |  |  | | --- | --- | | B. | $126,000 |  |  |  | | --- | --- | | C. | $90,000 |  |  |  | | --- | --- | | D. | $70,000 |   Residual income = Net operating income - (Average operating assets × Minimum required rate of return) = $200,000 - ($500,000 × 14%) = $130,000 |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 2 Medium Learning Objective: 11-02 Compute residual income and understand its strengths and weaknesses.* |

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| 86. | The return on investment last year for the North Division was:      |  |  | | --- | --- | | A. | 18% |  |  |  | | --- | --- | | **B.** | 40% |  |  |  | | --- | --- | | C. | 36% |  |  |  | | --- | --- | | D. | 80% |   ROI = Net operating income ÷ Average operating assets = $200,000 ÷ $500,000 = 40% |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 2 Medium Learning Objective: 11-01 Compute return on investment (ROI) and show how changes in sales; expenses; and assets affect ROI.* |

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|  | The West Division of Frede Corporation had average operating assets of $700,000 and net operating income of $120,800 in December. The minimum required rate of return for performance evaluation purposes is 16%. |

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| 87. | What was the West Division's minimum required return in December?      |  |  | | --- | --- | | **A.** | $112,000 |  |  |  | | --- | --- | | B. | $120,800 |  |  |  | | --- | --- | | C. | $131,328 |  |  |  | | --- | --- | | D. | $19,328 |   Minimum required return = Average operating assets × Minimum required rate of return = $700,000 × 16% = $112,000 |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 1 Easy Learning Objective: 11-02 Compute residual income and understand its strengths and weaknesses.* |

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| 88. | What was the West Division's residual income in December?      |  |  | | --- | --- | | **A.** | $8,800 |  |  |  | | --- | --- | | B. | $(19,328) |  |  |  | | --- | --- | | C. | $(8,800) |  |  |  | | --- | --- | | D. | $19,328 | |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 1 Easy Learning Objective: 11-02 Compute residual income and understand its strengths and weaknesses.* |

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|  | The Consumer Products Division of Mickolick Corporation had average operating assets of $450,000 and net operating income of $38,700 in August. The minimum required rate of return for performance evaluation purposes is 10%. |

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| 89. | What was the Consumer Products Division's minimum required return in August?      |  |  | | --- | --- | | A. | $3,870 |  |  |  | | --- | --- | | B. | $38,700 |  |  |  | | --- | --- | | C. | $48,870 |  |  |  | | --- | --- | | **D.** | $45,000 |   Minimum required return = Average operating assets × Minimum required rate of return = $450,000 × 10% = $45,000 |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 1 Easy Learning Objective: 11-02 Compute residual income and understand its strengths and weaknesses.* |

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| 90. | What was the Consumer Products Division's residual income in August?      |  |  | | --- | --- | | A. | $3,870 |  |  |  | | --- | --- | | B. | $6,300 |  |  |  | | --- | --- | | C. | $(3,870) |  |  |  | | --- | --- | | **D.** | $(6,300) | |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 1 Easy Learning Objective: 11-02 Compute residual income and understand its strengths and weaknesses.* |

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|  | Ricric Corporation has provided the following data for one of its products: |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 91. | The throughput time for this operation is:      |  |  | | --- | --- | | **A.** | 8 days |  |  |  | | --- | --- | | B. | 3 days |  |  |  | | --- | --- | | C. | 17 days |  |  |  | | --- | --- | | D. | 7.7 days |   Throughput time = Process time + Inspection time + Move time + Queue time = 3.0 days + 0.7 days + 0.3 days + 4.0 days = 8.0 days |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 1 Easy Learning Objective: 11-03 Compute delivery cycle time; throughput time; and manufacturing cycle efficiency (MCE).* |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 92. | The delivery cycle time for this operation is:      |  |  | | --- | --- | | A. | 8 days |  |  |  | | --- | --- | | **B.** | 17 days |  |  |  | | --- | --- | | C. | 9.3 days |  |  |  | | --- | --- | | D. | 7.7 days |   Throughput time = Process time + Inspection time + Move time + Queue time = 3.0 days + 0.7 days + 0.3 days + 4.0 days = 8.0 days  Delivery cycle time = Wait time + Throughput time = 9.0 days + 8.0 days = 17.0 days |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 1 Easy Learning Objective: 11-03 Compute delivery cycle time; throughput time; and manufacturing cycle efficiency (MCE).* |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 93. | The manufacturing cycle efficiency for this operation is closest to:      |  |  | | --- | --- | | **A.** | 0.375 |  |  |  | | --- | --- | | B. | 0.45 |  |  |  | | --- | --- | | C. | 0.18 |  |  |  | | --- | --- | | D. | 0.33 |   Throughput time = Process time + Inspection time + Move time + Queue time = 3.0 days + 0.7 days + 0.3 days + 4.0 days = 8.0 days  MCE = Value-added time (Process time) ÷ Throughput (manufacturing cycle) time = 3.0 days ÷ 8.0 days = 0.375 |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 2 Medium Learning Objective: 11-03 Compute delivery cycle time; throughput time; and manufacturing cycle efficiency (MCE).* |

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|  | Ebsen Corporation keeps careful track of the time required to fill orders. Data concerning a particular order appear below: |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 94. | The throughput time was:      |  |  | | --- | --- | | A. | 30.5 hours |  |  |  | | --- | --- | | B. | 4.5 hours |  |  |  | | --- | --- | | **C.** | 13.9 hours |  |  |  | | --- | --- | | D. | 26 hours |   Throughput time = Process time + Inspection time + Move time + Queue time = 1.3 hours + 0.3 hours + 2.9 hours + 9.4 hours = 13.9 hours |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 1 Easy Learning Objective: 11-03 Compute delivery cycle time; throughput time; and manufacturing cycle efficiency (MCE).* |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 95. | The manufacturing cycle efficiency (MCE) was closest to:      |  |  | | --- | --- | | A. | 0.84 |  |  |  | | --- | --- | | B. | 0.04 |  |  |  | | --- | --- | | C. | 0.17 |  |  |  | | --- | --- | | **D.** | 0.09 |   Throughput time = Process time + Inspection time + Move time + Queue time = 1.3 hours + 0.3 hours + 2.9 hours + 9.4 hours = 13.9 hours MCE = Value-added time (Process time) ÷ Throughput (manufacturing cycle) time = 1.3 hours ÷ 13.9 hours = 0.094 |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 2 Medium Learning Objective: 11-03 Compute delivery cycle time; throughput time; and manufacturing cycle efficiency (MCE).* |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 96. | The delivery cycle time was:      |  |  | | --- | --- | | A. | 2.9 hours |  |  |  | | --- | --- | | B. | 12.3 hours |  |  |  | | --- | --- | | **C.** | 30.5 hours |  |  |  | | --- | --- | | D. | 28.9 hours |   Delivery cycle time = Wait time + Throughput time = 16.6 hours + 13.9 hours = 30.5 hours |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 1 Easy Learning Objective: 11-03 Compute delivery cycle time; throughput time; and manufacturing cycle efficiency (MCE).* |

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|  | The following data pertain to operations at Quick Incorporated: |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 97. | The wait time for this operation would be:      |  |  | | --- | --- | | **A.** | 4 hours |  |  |  | | --- | --- | | B. | 2 hours |  |  |  | | --- | --- | | C. | 8 hours |  |  |  | | --- | --- | | D. | cannot be determined from information provided |   Delivery cycle time = Wait time + Throughput time 8 hours = Wait time + 4 hours Wait time = 8 hours - 4 hours = 4 hours |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 2 Medium Learning Objective: 11-03 Compute delivery cycle time; throughput time; and manufacturing cycle efficiency (MCE).* |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 98. | The combined inspection and move time for this operation would be:      |  |  | | --- | --- | | A. | 4 hours |  |  |  | | --- | --- | | **B.** | 1 hour |  |  |  | | --- | --- | | C. | 2 hours |  |  |  | | --- | --- | | D. | cannot be determined from information provided |   Throughput time = Process time + Inspection time + Move time + Queue time 4 hours = 1 hour + Inspection time + Move time + 2 hours Inspection time + Move time = 4 hours - 1 hour - 2 hours = 1 hour |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 3 Hard Learning Objective: 11-03 Compute delivery cycle time; throughput time; and manufacturing cycle efficiency (MCE).* |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 99. | The manufacturing cycle efficiency (MCE) for this operation would be:      |  |  | | --- | --- | | A. | 50% |  |  |  | | --- | --- | | B. | 75% |  |  |  | | --- | --- | | **C.** | 25% |  |  |  | | --- | --- | | D. | 12% |   MCE = Value-added time (Process time) ÷ Throughput (manufacturing cycle) time = 1 hour ÷ 4 hours = 25% |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 1 Easy Learning Objective: 11-03 Compute delivery cycle time; throughput time; and manufacturing cycle efficiency (MCE).* |

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|  | Jolin Corporation keeps careful track of the time required to fill orders. The times recorded for a particular order appear below: |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 100. | The delivery cycle time was:      |  |  | | --- | --- | | A. | 11 hours |  |  |  | | --- | --- | | B. | 37.1 hours |  |  |  | | --- | --- | | C. | 2 hours |  |  |  | | --- | --- | | **D.** | 38.5 hours |   Throughput time = Process time + Inspection time + Move time + Queue time = 1.2 hours + 0.2 hours + 2.0 hours + 9.0 hours = 12.4 hours Delivery cycle time = Wait time + Throughput time = 26.1 hours + 12.4 hours = 38.5 hours |

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| *AACSB: Analytic AICPA BB: Critical Thinking AICPA FN: Measurement Blooms: Apply Difficulty: 1 Easy Learning Objective: 11-03 Compute delivery cycle time; throughput time; and manufacturing cycle efficiency (MCE).* |

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| 101. | The throughput time was:      |  |  | | --- | --- | | **A.** | 12.4 hours |  |  |  | | --- | --- | | B. | 35.1 hours |  |  |  | | --- | --- | | C. | 38.5 hours |  |  |  | | --- | --- | | D. | 3.4 hours |   Throughput time = Process time + Inspection time + Move time + Queue time = 1.2 hours + 0.2 hours + 2.0 hours + 9.0 hours = 12.4 hours |

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| 102. | The manufacturing cycle efficiency (MCE) was closest to:      |  |  | | --- | --- | | A. | 0.03 |  |  |  | | --- | --- | | B. | 0.16 |  |  |  | | --- | --- | | **C.** | 0.10 |  |  |  | | --- | --- | | D. | 0.48 |   Throughput time = Process time + Inspection time + Move time + Queue time = 1.2 hours + 0.2 hours + 2.0 hours + 9.0 hours = 12.4 hours MCE = Value-added time (Process time) ÷ Throughput (manufacturing cycle) time = 1.2 hours ÷ 12.4 hours = 0.097 |

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**Essay Questions**

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| 103. | Handle Fabrication is a division of a major corporation. Last year the division had total sales of $36,160,000, net operating income of $2,892,800, and average operating assets of $8,000,000. The company's minimum required rate of return is 12%.  **Required:**  What is the division's return on investment (ROI)?     ROI = Net operating income ÷ Average operating assets = $2,892,800 ÷ $8,000,000 = 36.16% |

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| 104. | Gaal Industries is a division of a major corporation. Last year the division had total sales of $26,110,000, net operating income of $1,801,590, and average operating assets of $7,000,000. The company's minimum required rate of return is 18%.  **Required:**  a. What is the division's margin? b. What is the division's turnover? c. What is the division's return on investment (ROI)?     a. Margin = Net operating income ÷ Sales = $1,801,590 ÷ $26,110,000 = 6.9% b. Turnover = Sales ÷ Average operating assets = $26,110,000 ÷ $7,000,000 = 3.73 c. ROI = Net operating income ÷ Average operating assets = $1,801,590 ÷ $7,000,000 = 25.737% |

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| 105. | Financial data for Redstone Company for last year appear below:          The company paid dividends of $32,200 last year. The "Investment in Balsam Company" on the statement of financial position represents an investment in the stock of another company.  **Required:**  a. Compute the company's margin, turnover, and return on investment for last year. b. The Board of Directors of Redstone has set a minimum required return of 25%. What was the company's residual income last year?     a. Operating assets do not include investments in other companies or in undeveloped land.      Average operating assets = ($460,000 + $480,000) ÷ 2 = $470,000 Margin = Net operating income ÷ Sales = $122,200 ÷ $1,222,000 = 10% Turnover = Sales ÷ Average operating assets = $1,222,000 ÷ $470,000 = 2.6 ROI = Margin × Turnover = 10% × 2.6 = 26%  b. |

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| 106. | Guerlane Fragrance Corporation has a perfume division, Essense, and a cologne division, Karisma. The following information relates to last year's operations at each division. The minimum required rate of return is the same for both divisions.      **Required:**  Compute the unknown quantities above [(a) through (g)]. SHOW YOUR COMPUTATIONS.     (a) ROI = Net operating income ÷ Average operating assets 20% = Net operating income ÷ $120,000 Net operating income = 20% × $120,000 = $24,000 (b) Margin = Net operating income ÷ Sales Margin = $24,000 ÷ $360,000 = 6.67% (c) Turnover = Sales ÷ Average operating assets Turnover = $360,000 ÷ $120,000 = 3 (d) Margin = Net operating income ÷ Sales 5% = $10,000 ÷ Sales Sales = $10,000 ÷ 5% = $200,000 (e) Turnover = Sales ÷ Average operating assets 2.5 = $200,000 ÷ Average operating assets Average operating assets = $200,000 ÷ 2.5 = $80,000 (f) ROI = Margin × Turnover ROI = 5% × 2.5 = 12.5% (g) From Essense: Residual income = Net operating income - (Average operating assets × Minimum required rate of return) $6,000 = $24,000 - ($120,000 × Minimum required rate of return) $120,000 × Minimum required rate of return = $18,000 Minimum required rate of return = $18,000 ÷ $120,000 = 15% For Karisma: Residual income = Net operating income - (Average operating assets × Minimum required rate of return) Residual income = $10,000 - ($80,000 × 15%) = $(2,000) |

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| 107. | Faas Wares is a division of a major corporation. The following data are for the latest year of operations:      **Required:**  a. What is the division's return on investment (ROI)? b. What is the division's residual income?     a. ROI = Net operating income ÷ Average operating assets = $1,738,080 ÷ $6,000,000 = 28.968% b. Residual income = Net operating income - Minimum required rate of return × Average operating assets = $1,738,080 - (16% × $6,000,000) = $778,080 |

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| 108. | Eacher Wares is a division of a major corporation. The following data are for the latest year of operations:      **Required:**  a. What is the division's margin? b. What is the division's turnover? c. What is the division's return on investment (ROI)? d. What is the division's residual income?     a. Margin = Net operating income ÷ Sales = $1,000,960 ÷ $14,720,000 = 6.8% b. Turnover = Sales ÷ Average operating assets = $14,720,000 ÷ $4,000,000 = 3.68 c. ROI = Net operating income ÷ Average operating assets = $1,000,960 ÷ $4,000,000 = 25.024% d. Residual income = Net operating income - Minimum required rate of return × Average operating assets = $1,000,960 - 14% × $4,000,000 = $440,960 |

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| 109. | Hysong Corporation uses residual income to evaluate the performance of its divisions. The minimum required rate of return for performance evaluation purposes is 11%. The Games Division had average operating assets of $530,000 and net operating income of $56,200 in June.  **Required:**  What was the Games Division's residual income in June? |

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| 110. | Iba Industries is a division of a major corporation. The following data are for the latest year of operations:      **Required:**  What is the division's residual income?     Residual income = Net operating income - Minimum required rate of return × Average operating assets = $436,500 - 18% × $2,000,000 = $76,500 |

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| 111. | The Casket Division of Landazuri Corporation had average operating assets of $620,000 and net operating income of $86,000 in February. The company uses residual income to evaluate the performance of its divisions, with a minimum required rate of return of 14%.  **Required:**  What was the Casket Division's residual income in February? |

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| 112. | During the most recent month at Luinstra Corporation, queue time was 4.5 days, inspection time was 0.8 day, process time was 1.9 days, wait time was 5.1 days, and move time was 0.7 day.  **Required:**  a. Compute the throughput time. b. Compute the manufacturing cycle efficiency (MCE). c. What percentage of the production time is spent in non-value-added activities? d. Compute the delivery cycle time.     a. Throughput time = Process time + Inspection time + Move time + Queue time = 1.9 days + 0.8 days + 0.7 days + 4.5 days = 7.9 days b. MCE = Value-added time (Process time) ÷ Throughput time = 1.9 days ÷ 7.9 days = 0.24 c. Percentage of time spent on non-value-added activities = 100% - MCE% = 100% - 24% = 76% d. Delivery cycle time = Wait time + Throughput time = 5.1 days + 7.9 days = 13.0 days |

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| 113. | Rintharamy Corporation's management reports that its average delivery cycle time is 25.2 days, its average throughput time is 7.6 days, its manufacturing cycle efficiency (MCE) is 0.25, its average move time is 0.9 day, and its average queue time is 4.0 days.  **Required:**  a. What is the wait time? b. What is the process time? c. What is the inspection time?     a. Delivery cycle time = Wait time + Throughput time 25.2 days = Wait time + 7.6 days Wait time = 25.2 days - 7.6 days = 17.6 days b. MCE = Process time ÷ Throughput time 0.25 = Process time ÷ 7.6 days Process time = 0.25 × 7.6 days = 1.9 days c. Throughput time = Process time + Inspection time + Move time + Queue time 7.6 days = 1.9 days + Inspection time + 0.9 days + 4.0 days Inspection time = 7.6 days - 1.9 days - 0.9 days - 4.0 days = 0.8 days |

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| 114. | Hardenburg Corporation keeps careful track of the time required to fill orders. The times required for a particular order appear below:      **Required:**  a. Determine the throughput time. Show your work! b. Determine the manufacturing cycle efficiency (MCE), Show your work! c. Determine the delivery cycle time. Show your work!     a. Throughput time = Process time + Inspection time + Move time + Queue time = 1.4 hours + 0.1 hours + 3.3 hours + 9.7 hours = 14.5 hours b. MCE = Value-added time ÷ Throughput time = 1.4 hours ÷ 14.5 hours = 0.097 c. Delivery cycle time = Wait time + Throughput time = 19.9 hours + 14.5 hours = 34.4 hours |

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| 115. | Pardun Corporation's management keeps track of the time it takes to process orders. During the most recent month, the following average times were recorded per order:      **Required:**  a. Compute the throughput time. b. Compute the manufacturing cycle efficiency (MCE). c. What percentage of the production time is spent in non-value-added activities? d. Compute the delivery cycle time.    a. Throughput time = Process time + Inspection time + Move time + Queue time = 1.6 days + 0.8 days + 0.7 days + 3.9 days = 7.0 days b. MCE = Value-added time (Process time) ÷ Throughput time = 1.6 days ÷ 7.0 days = 0.23 (rounded) c. Percentage of time spent on non-value-added activities = 100% - MCE% = 100% - 23% = 77% d. Delivery cycle time = Wait time + Throughput time = 15.6 days + 7.0 days = 22.6 days |

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