

TRUE/FALSE. Write 'T' if the statement is true and 'F' if the statement is false.

- 1) The process of making capital investment decisions is referred to as capital return. 1) _____
- 2) Self-scan check-out machines are an example of capital assets. 2) _____
- 3) Capital budgeting is based on job costing. 3) _____
- 4) IFRS requires that companies use capital budgeting techniques. 4) _____
- 5) IFRS and ASPE are based on accrual accounting but capital budgeting uses cash flows. 5) _____
- 6) Choosing among alternative capital investments is called capital rationing. 6) _____
- 7) Post-audits of capital investments help determine the net cash flows generated by capital investments. 7) _____
- 8) The costs to develop a major website for a company would be considered to be a capital asset if those costs are significant. 8) _____
- 9) The cost associated with renovating a warehouse to be used as a restaurant would be considered to be a capital asset. 9) _____
- 10) The health care insurance cost of a company for its assembly-line workers would be considered to be a capital asset. 10) _____
- 11) Capital investment analysis in sustainability should consider future cost savings such as fewer lawsuits and regulatory fines. 11) _____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

- 12) Which of the following items would be considered to be a capital asset? 12) _____
 - A) Construction of new store building
 - B) Purchase of office supplies to be used internally over the next year
 - C) Payment for this year's advertising campaign
 - D) Donation of money to United Way

- 13) What is the name given to choosing among different alternative investments due to limited resources? 13) _____
A) Resource rationing B) Capital rationing
C) Capital investing D) Resource allocation
- 14) Which of the following is true regarding capital rationing decisions for capital assets? 14) _____
A) Companies should always choose the investment with the highest NPV.
B) Companies should always choose the investment with the highest ARR.
C) Companies should always choose the investment with the shortest payback period.
D) Companies may have to choose a subset of available capital investments.
- 15) After a company invests in capital assets, which of the following will it perform in order to compare the actual to the projected net cash inflows? 15) _____
A) Post-audit B) Pre and post analysis
C) Cash flow analysis D) Post-cash flow
- 16) Which term below is best described as a "formal means of analyzing long-range investment alternatives"? 16) _____
A) Capital budgeting B) Annuity
C) Time value of money D) Payback period
- 17) The following are all methods of analyzing capital investments EXCEPT 17) _____
A) Regression Analysis. B) Net Present Value (NPV).
C) Payback Period. D) Accounting Rate of Return (ARR).

ESSAY. Write your answer in the space provided or on a separate sheet of paper.

- 18) Identify and explain the steps involved in the capital budgeting process

TRUE/FALSE. Write 'T' if the statement is true and 'F' if the statement is false.

- 19) Investments with shorter payback periods are more desirable, all else being equal. 19) _____
- 20) The payback method can only be used when the net cash inflows from a capital investment are the same for each period. 20) _____
- 21) One of the criticisms of the payback period is that it ignores cash flows that occur after the payback period. 21) _____
- 22) Capital budgeting predictions must consider factors such as changing consumer preferences, competition, and government regulations. 22) _____
- 23) The accounting rate of return method of analyzing capital budgeting decisions measures the average annual rate of return from using the asset over its entire life. 23) _____

- 24) The accounting rate of return is a measure of liquidity computed by dividing the average annual cash flows from an asset by the average amount invested in the asset. 24) _____
- 25) Accrual-based accounting is used in determining the accounting rate of return. 25) _____
- 26) The payback method primarily focuses on time and not profitability. 26) _____
- 27) The Accounting Rate of Return is the only method approved by IFRS. 27) _____
- 28) One advantage of the accounting rate of return is that it considers the time value of money. 28) _____
- 29) One disadvantage of the payback method is that it does not consider the time value of money. 29) _____
- 30) The payback method is widely considered to be the best capital budgeting method because it considers the time it takes to recoup the cost of the capital asset. 30) _____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

- 31) How does depreciation affect the calculation of a project's payback period? 31) _____
 A) Depreciation does not affect the payback calculation.
 B) Depreciation is deducted from the annual cash inflows.
 C) Depreciation is only deducted if the payback period exceeds five years.
 D) Depreciation is added to the annual cash inflows.
- 32) Which term below is best described as "the length of time required to recover the cost of an investment"? 32) _____
 A) Payback period
 B) Time value of money
 C) Capital budgeting
 D) Annuity
- 33) Which capital budgeting method uses accrual accounting, rather than net cash flows, as a basis for calculations? 33) _____
 A) NPV
 B) IRR
 C) Payback
 D) ARR
- 34) How does depreciation affect the calculation of a project's accounting rate of return (ARR)? 34) _____
 A) Depreciation is added to the annual cash inflows.
 B) Depreciation is deducted from the annual cash inflows.
 C) Depreciation is only deducted if the ARR is less than the minimum required rate of return.
 D) Depreciation does not affect ARR.
- 35) When computing the payback period for a capital asset with equal annual net cash inflows, which of the following is used as the equation's numerator? 35) _____
 A) Total cash inflows
 B) Net cash outflow
 C) Expected annual cash inflow
 D) Amount invested

- 36) When computing the accounting rate of return for a capital asset, which of the following is used as the equation's numerator? 36) _____
- A) Total amount invested in the asset
 - B) Average annual operating income from the asset
 - C) Average net cash flows from the asset
 - D) Average amount invested in the asset
- 37) All else being equal, a company would choose to invest in a capital asset if which of the following is TRUE? 37) _____
- A) If the payback period equals the amount invested
 - B) If the expected accounting rate of return is greater than the required rate of return
 - C) If the average amount invested is equal to the net cash inflows
 - D) If the expected accounting rate of return is less than the required rate of return
- 38) Which of the following is the formula for calculating the accounting rate of return for a capital asset? 38) _____
- A) $(\text{Average annual cash inflows} - \text{depreciation expense}) / (\text{amount invested in asset} + \text{residual value of asset})$
 - B) $\text{Average annual net cash inflow from asset} / \text{amount invested in asset}$
 - C) $\text{Average annual operating income from asset} / \text{amount invested in asset}$
 - D) $(\text{Average annual operating income} + \text{depreciation expense}) / \text{amount invested in asset}$

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

Latimer Corporation is considering two alternative investment proposals with the following data:

	Proposal X	Proposal Y
Investment	\$812,500	\$390,000
Useful life	8 years	8 years
Estimated annual net cash inflows for 8 years	\$125,000	\$78,000
Residual value	\$40,000	\$-
Depreciation method	Straight-line	Straight-line
Required rate of return	14%	10%

- 39) How long is the payback period for Proposal X at Latimer Corporation? 39) _____
- A) 20.31 years
 - B) 10.42 years
 - C) 6.50 years
 - D) 5.00 years
- 40) How long is the payback period for Proposal Y at Latimer Corporation? 40) _____
- A) 5.00 years
 - B) 9.75 years
 - C) 20.31 years
 - D) 6.50 years
- 41) What is the accounting rate of return for Proposal X at Latimer Corporation? 41) _____
- A) 27.27%
 - B) 4.22%
 - C) 3.50%
 - D) 15.38%
- 42) What is the accounting rate of return for Proposal Y at Latimer Corporation? 42) _____
- A) 8.78%
 - B) 20.00%
 - C) 32.50%
 - D) 7.50%

- 43) Brackett Corporation is adding a new product line that will require an investment of \$120,000. The product line is estimated to generate cash inflows of \$25,000 the first year, \$23,000 the second year, and \$18,000 each year thereafter for ten more years. What is the payback period?
- A) 6.67 years B) 6.00 years C) 6.32 years D) 4.80 years

43) _____

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

Boyle Company is evaluating two possible investments in depreciable plant assets. The company uses the straight-line method of depreciation. The following information is available:

	Investment A	Investment B
Initial capital investment	\$100,000	\$150,000
Estimated useful life	3 years	3 years
Estimated residual value	\$10,000	\$15,000
Estimated annual net cash inflow of 3 years	\$25,000	\$40,000
Required rate of return	10%	12%

- 44) How long is the payback period for Investment A at Boyle Company?
- A) 10.00 years B) 3.60 years C) 4.00 years
- 45) How long is the payback period for Investment B at Boyle Company?
- A) 3.75 years B) 2.40 years C) 3.38 years
- 46) What is the accounting rate of return for Investment A at Boyle Company?
- A) 5.0% B) 25.0% C) -5.0%
- 47) What is the accounting rate of return for Investment B at Boyle Company?
- A) -3.3% B) -5.0% C) 2.0%

D) 2.49 years

D) 10.00 years

D) -25.0%

D) 3.3%

- 48) Mahtomedi Corporation is considering investing in specialized equipment costing \$240,000. The equipment has a useful life of 5 years and a residual value of \$20,000. Depreciation is calculated using the straight-line method. The expected net cash inflows from the investment are:

Year 1	\$60,000
Year 2	\$90,000
Year 3	\$110,000
Year 4	\$40,000
Year 5	\$25,000
Total cash inflows	\$325,000

Mahtomedi Corporation's required rate of return on investments is 14%.

What is the accounting rate of return on the investment?

- A) 9.25% B) 16.40% C) 8.75% D) 6.67%

48) _____

49) Richol Corporation is considering an investment in new equipment costing \$180,000. The equipment will be depreciated on a straight-line basis over a five-year life and is expected to generate net cash inflows of \$45,000 the first year, \$65,000 the second year, and \$90,000 every year thereafter until the fifth year. What is the payback period for this investment? The equipment has no residual value.

49) _____

- A) 2.00 years B) 4.00 years C) 2.37 years D) 2.78 years

50) Suppose Barnes & Noble Booksellers is considering investing in warehouse-management software that costs \$500,000, has \$50,000 residual value and should lead to cash cost savings of \$120,000 per year for its five-year life. In calculating the ARR, which of the following figures should be used as the equation's denominator?

50) _____

- A) \$275,000 B) \$500,000 C) \$250,000 D) \$225,000

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

Dazzle Company uses straight-line depreciation and is considering a capital expenditure for which the following relevant cash data have been estimated:

Estimated useful life:	3 years
Initial investment:	\$500,000
Savings year 1:	\$200,000
Savings year 2:	\$150,000
Savings year 3:	\$225,000
Residual value after 3 yrs	\$20,000

51) Total net inflows from savings at Dazzle Company DURING the useful life of the asset are

51) _____

- A) \$595,000. B) \$555,000. C) \$75,000. D) \$575,000.

52) Total operating income at Dazzle Company from the asset over the 3-year period is

52) _____

- A) \$75,000. B) \$415,000. C) \$160,000. D) \$95,000.

53) The total depreciation expense at Dazzle Company over the life of the asset is

53) _____

- A) \$520,000. B) \$575,000. C) \$160,000. D) \$480,000.

54) The accounting rate of return at Dazzle Company is closest to

54) _____

- A) 6.33%. B) 38.33%. C) 32.00%. D) 5.51%.

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

Williams Department Stores is considering two possible expansion plans. One proposal involves opening 5 stores in Manitoba at a cost of \$1,800,000. Under the other proposal, the company would focus on Alberta and open 6 stores at a cost of \$2,400,000. The following information is available:

	Manitoba proposal	Alberta proposal
Required investment	\$1,800,000	\$2,400,000
Estimated life	10 years	10 years
Estimated residual value	\$50,000	\$80,000
Estimated annual cash inflows over the next 10 years	\$400,000	\$500,000
Required rate of return	10%	10%

- 55) The payback period for the Alberta proposal is closest to 55) _____
 A) 7.0 years. B) 4.5 years. C) 4.8 years. D) 6.0 years.
- 56) The payback period for the Manitoba proposal is closest to 56) _____
 A) 4.5 years. B) 4.8 years. C) 3.6 years. D) 36.0 years.
- 57) The accounting rate of return for the Alberta proposal is closest to 57) _____
 A) 20.83%. B) 11.17%. C) 12.50%. D) 10.83%.
- 58) The accounting rate of return for the Manitoba proposal is closest to 58) _____
 A) 12.22%. B) 22.22%. C) 12.50%. D) 11.17%.
- 59) Rinky Dink Family Fun Centre bought new bumper boats for its recreation facility. The useful life is 6 years. The bumper boats had a total cost \$5,338 and will generate \$1,570 total cash inflows each year for the life of the boats. The residual value of the bumper boats is \$650. The payback period in years is closest to 59) _____
 A) 3.81. B) 3.40. C) 2.40. D) 2.99.
- 60) Sierra Discount Drugstore bought a new high-speed photo printer for customers to be able to bring in their digital pictures to make high-quality prints. Its useful life is 6 years. The printer cost \$8,170 and will generate annual cash inflows of \$2,150. The residual value of the printer is \$1,320. The payback period in years is closest to 60) _____
 A) 3.19. B) 4.41. C) 2.35. D) 3.80.

- 61) Buster Corporation is evaluating a capital investment project which would require an initial invest of \$285,000 to purchase machinery. The annual revenues and expenses generated solely by this pro each year during the project's nine year life would be: 61) _____

Sales	\$185,000
Variable expenses	\$38,000
Contribution margin	\$147,000
Fixed expenses:	
Salaries expense	\$31,000
Rent expense	\$24,000
Depreciation expense	\$30,000
Total fixed expenses	\$85,000
Operating income	\$62,000

The residual value of the machinery at the end of the nine years would be \$15,000. The payback pe of this potential project in years would be closest to

- A) 1.6. B) 4.6. C) 3.1. D) 3.7.
- 62) Sawyer & Cecil, Computer Consultants, is considering an investment in computer and network equipment costing \$254,000. This equipment would allow them to offer new programming services to clients. The equipment will be depreciated on the straight-line basis over an eight-year period with an estimated residual value of \$60,000. Using the accounting rate of return model, what is the minimum average annual operating income that must be generated from this investment in order to achieve a 12% accounting rate of return? 62) _____
- A) \$23,280 B) \$7,200 C) \$30,480 D) \$31,750

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

The Warren Company is considering investing in two alternative projects:

	Project 1	Project 2
Investment	\$400,000	\$250,000
Useful life (years)	5	6
Estimated annual net cash inflows for useful life	\$100,000	\$45,000
Residual value	\$25,000	\$15,000
Depreciation method	Straight-line	Straight-line
Required rate of return	12%	8%

- 63) What is the payback period for Project 1? 63) _____
- A) 8.89 years B) 4.00 years C) 16.00 years D) 5.56 years
- 64) What is the payback period for Project 2? 64) _____
- A) 4.00 years B) 5.56 years C) 16.00 years D) 10.00 years
- 65) What is the accounting rate of return for Project 1? 65) _____
- A) 43.75% B) 25.00% C) 1.88% D) 6.25%

- 66) What is the accounting rate of return for Project 2? 66) _____
 A) 33.67% B) 2.33% C) 3.00% D) 18.00%

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

Pitt Company is evaluating two possible investments in depreciable plant assets. The company uses the straight-line method of depreciation. The following information is available:

	Investment A	Investment B
Initial capital investment	\$112,500	\$160,000
Estimated useful life	5 years	5 years
Estimated residual value	\$10,000	\$15,000
Estimated annual net cash inflow For 3 years	\$25,000	\$40,000
Required rate of return	10%	12%

- 67) How long is the payback period for Investment A? 67) _____
 A) 2.49 years B) 4.10 years C) 4.50 years D) 11.25 years
- 68) How long is the payback period for Investment B? 68) _____
 A) 3.63 years B) 10.67 years C) 4.00 years D) 2.40 years

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

- 69) Simone Corporation bought a new machine which cost \$90,000, has a useful life of 10 years, and will generate annual cash inflows of \$25,000. The residual value of the machine is \$8,500. What is the payback period? 69) _____
- 70) Abdul Corporation bought a new machine, which cost \$87,000, has a useful life of 10 years, and will generate annual cash inflows of \$15,000. The residual value of the machine is \$5,700. What is the payback period? 70) _____
- 71) The Toth Company bought a new specialty machine that cost \$100,000 with a 4-year life with a \$12,000 residual value. The company plans to generate annual cash inflows of \$30,000 each year for 4 years. Calculate the accounting rate of return. 71) _____
- 72) The Jones Company bought a new specialty machine that cost \$120,000 with a 6-year life with no residual value. The company plans to generate annual cash inflows of \$25,000 each year for 6 years. Calculate the accounting rate of return. 72) _____
- 73) The Harris Corporation bought a used machine that cost it \$170,000 with a 15-year remaining life and no residual value. They plan to generate annual cash inflows of \$30,000 over 15 years. Calculate the accounting rate of return. 73) _____

74) Meccah, Inc., is considering investing \$250,000 in a machine that will last 4 years with no residual value. The new machine will generate annual operating income of \$60,000 per year for 4 years. What is the accounting rate of return? 74) _____

75) Ryan Manufacturing is considering acquiring another facility for a cost of \$610,000. The required payback period is 4.5 years. Assume annual net cash inflows are \$160,000 for the first two years and \$125,000 for years 3 and 4. What must the inflow be in the fifth year to meet the 4.5 year payback period? 75) _____

76) Lincoln Transportation Services is considering a capital expenditure proposal for the improvement of its distribution centre. The project would require a capital investment of \$240,000; have a 10 year useful life with no residual value and generate net cash flows of \$60,000 per year Lincoln uses the straight line method of amortization on all capital assets. 76) _____

Compute the payback period for this proposal.

77) Lincoln Transportation Services is considering a capital expenditure proposal for the improvement of its distribution centre. The project would require a capital investment of \$240,000; have a 10 year useful life with no residual value and generate net cash flows of \$60,000 per year Lincoln uses the straight line method of amortization on all capital assets. 77) _____

Compute the accounting rate of return for this proposal

78) Lincoln Transportation Services is considering a capital expenditure proposal for the improvement of its distribution centre. The project would require a capital investment of \$228,000; have a 6 year useful life with no residual value and generate net cash flows of \$4 per year Lincoln uses the straight line method of amortization on all capital assets. 78) _____

Compute the payback period for this proposal.

79) Lincoln Transportation Services is considering a capital expenditure proposal for the improvement of its distribution centre. The project would require a capital investment of \$228,000; have a 6 year useful life with no residual value and generate net cash flows of \$7 per year Lincoln uses the straight line method of amortization on all capital assets. 79) _____

Compute the accounting rate of return for this proposal.

- 80) Lincoln Transportation Services is considering a capital expenditure proposal for the improvement of its distribution centre. The project would require a capital investment of \$228,000; have a 6 year useful life with no residual value and generate net cash flows as follow:

80) _____

Year	Annual Net Cash Inflow
1	\$48,000
2	60,000
3	84,000
4	90,000
5	90,000
6	45,000

Lincoln uses the straight line method of amortization on all capital assets.

Compute the payback period for this proposal.

- 81) Lincoln Transportation Services is considering a capital expenditure proposal for the improvement of its distribution centre. The project would require a capital investment of \$228,000; have a 6 year useful life with no residual value and generate net cash flows as follow:

81) _____

Year	Annual Net Cash Inflow
1	\$48,000
2	60,000
3	84,000
4	90,000
5	90,000
6	45,000

Lincoln uses the straight line method of amortization on all capital assets.

Compute the accounting rate of return for this proposal.

- 82) Lincoln Transportation Services is considering a capital expenditure proposal for the improvement of its distribution centre. The project would require a capital investment of \$300,000; have a 5 year useful life with no residual value and generate net cash flows as follow:

82) _____

Year	Annual Net Cash Inflow
1	\$90,000
2	90,000
3	72,000
4	96,000
5	120,000

Lincoln uses the straight line method of amortization on all capital assets.

Compute the payback period for this proposal.

- 83) Lincoln Transportation Services is considering a capital expenditure proposal for the improvement of its distribution centre. The project would require a capital investment of \$300,000; have a 5 year useful life with no residual value and generate net cash flows as follow:

83) _____

Year	Annual Net Cash Inflow
1	\$90,000
2	90,000
3	72,000
4	96,000
5	120,000

Lincoln uses the straight line method of amortization on all capital assets.

Compute the accounting rate of return for this proposal.

- 84) Lincoln Transportation Services is considering a capital expenditure proposal for the improvement of its distribution centre. The project would require a capital investment of \$252,000; have a 5 year useful life with no residual value and generate net cash flows as follow:

84) _____

Year	Annual Net Cash Inflow
1	\$90,000
2	90,000
3	72,000
4	48,000
5	24,000

Lincoln uses the straight line method of amortization on all capital assets.

Compute the payback period for this proposal.

- 85) Lincoln Transportation Services is considering a capital expenditure proposal for the improvement of its distribution centre. The project would require a capital investment of \$252,000; have a 6 year useful life with no residual value and generate net cash flows as follow:

85) _____

Year	Annual Net Cash Inflow
1	\$90,000
2	90,000
3	72,000
4	48,000
5	24,000

Lincoln uses the straight line method of amortization on all capital assets.

Compute the accounting rate of return for this proposal.

- 86) Buller Manufacturing is considering acquiring another facility for a cost of \$610,000. The required payback period is 4.5 years. Assume annual net cash inflows are \$150,000 for the first two years and \$125,000 for years 3 and 4. What must the inflow be in the fifth year to meet the 4.5 year payback period?

86) _____

ESSAY. Write your answer in the space provided or on a separate sheet of paper.

- 87) Compare and contrast the benefits and drawbacks of the Payback and Accounting Rate of Return methods of evaluating capital projects.

TRUE/FALSE. Write 'T' if the statement is true and 'F' if the statement is false.

- 88) The net present value method incorporates the time value of money.

88) _____

- 89) The principal amount and the interest rate are the only factors needed to calculate the time value of money.

89) _____

- 90) Calculating interest on the principal and on all the interest earned to date is called compound interest.

90) _____

- 91) Calculating interest on the principal only is called compound interest.

91) _____

- 92) When computing the time value of money, the interest rate must always be expressed as an annual rate.

92) _____

- 93) The Future Value of \$1 table is used to calculate how much \$100 would be worth in 5 years.

93) _____

- 94) The three factors that affect the time value of money are principal, number of periods, and interest rate.

94) _____

95) An ordinary annuity is is an annuity in which installments occur at the beginning of each period. 95) _____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

96) Which term below is best described as the "relationship among principle, interest rate, and time"? 96) _____
A) Time value of money B) Annuity
C) Capital budgeting D) Payback period

97) Which term below is best described as "a stream of equal periodic payments"? 97) _____
A) Annuity B) Capital budgeting
C) Payback period D) Time value of money

98) Which of the following explains the time value of money? 98) _____
A) Money is more valuable over time.
B) A stream of payments is received over time.
C) Invested money earns income over time.
D) Interest is always compounded over time.

99) Your grandmother has promised to give you \$2,000 a year at the end of each of the next four years if you earn Cs or better in all of your courses each year. Using a discount rate of 8%, which of the following is correct for determining the present value of the gift? 99) _____
A) $PV = \$2,000 \times (PV \text{ factor}, i = 4\%, n = 8)$
B) $PV = \$2,000 \times (\text{Annuity FV factor}, i = 8\%, n = 4)$
C) $PV = \$2,000 \times (\text{Annuity PV factor}, i = 8\%, n = 4)$
D) $PV = \$2,000 \times 8\% \times 4$

100) You won the lottery and have a number of choices as to how to take the money. Which choice yields a greater present value? 100) _____
A) \$10,000 a year at the end of each of the next 6 years using a 6% discount rate
B) \$84,000 (lump sum) 7 years from now using a 6% discount rate
C) \$92,000 (lump sum) 7 years from now using an 8% discount rate
D) \$45,000 (lump sum) now using a 6% discount rate

101) Your rich aunt has promised to give you \$3,000 a year at the end of each of the next four years to help with college. Using a discount rate of 10%, the present value of the gift can be stated as 101) _____
A) $PV = \$3,000 (\text{Annuity FV factor}, i = 10\%, n = 4)$.
B) $PV = \$3,000 \times 10\% \times 5$.
C) $PV = \$3,000 (\text{PV factor}, i = 4\%, n = 4)$.
D) $PV = \$3,000 (\text{Annuity PV factor}, i = 10\%, n = 4)$.

102) You win the lottery and must decide how to take the payout. Use an 8% discount rate. What is the present value of \$10,000 a year received at the end of each of the next six years? 102) _____
A) \$46,230 B) \$60,000 C) \$10,000 D) \$49,928

- 103) Assuming an interest rate of 10%, the present value of \$40,000 to be received 8 years from now would be closest to 103) _____
 A) \$15,440. B) \$85,760. C) \$18,660. D) \$16,960.
- 104) Assuming an interest rate of 10%, the present value of \$12,000 received at the end of each year for 6 years would be closest to 104) _____
 A) \$52,264. B) \$6,768. C) \$72,000. D) \$92,592.
- 105) Assuming an interest rate of 10%, if you invest a lump sum of \$4,000 now, the balance of your investment in 7 years will be closest to 105) _____
 A) \$28,000. B) \$10,376. C) \$7,796. D) \$19,472.
- 106) If you invest \$1,000 at the end of every year for five years at an interest rate of 10%, the balance of your investment in 5 years will be closest to 106) _____
 A) \$1,611. B) \$6,105. C) \$3,791. D) \$5,000.
- 107) Assuming an interest rate of 6%, the present value of \$20,000 to be received 9 years from now would be closest to 107) _____
 A) \$14,940. B) \$31,880. C) \$33,784. D) \$11,840.
- 108) Assuming an interest rate of 6%, the present value of \$16,000 received at the end of each year for 6 years would be closest to 108) _____
 A) \$128,000. B) \$10,640. C) \$111,600. D) \$78,672.
- 109) Assuming an interest rate of 6%, if you invest a lump sum of \$6,000 now, the balance of your investment in 7 years will be closest to 109) _____
 A) \$33,492. B) \$36,000. C) \$10,746. D) \$9,024.
- 110) If you invest \$4,000 at the end of every year for nine years at an interest rate of 6%, the balance of your investment in 5 years will be closest to 110) _____
 A) \$16,848. B) \$22,548. C) \$36,000. D) \$5,352.
- 111) Assuming an interest rate of 6%, the present value of \$18,000 received at the end of each year for 6 years would be closest to 111) _____
 A) \$108,000. B) \$11,970. C) \$125,550. D) \$88,506.
- 112) Assuming an interest rate of 6%, if you invest a lump sum of \$6,500 now, the balance of your investment in 7 years will be closest to 112) _____
 A) \$11,642. B) \$36,283. C) \$9,776. D) \$45,500.
- 113) If you invest \$5,000 at the end of every year for ten years at an interest rate of 6%, the balance of your investment in 5 years will be closest to 113) _____
 A) \$65,905. B) \$64,308. C) \$57,455. D) \$50,000.

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

- 114) You win the lottery and must decide how to take the payout. Use an 8% discount rate for a 114) _____
parts of this question.

Required:

1. What is the present value of \$10,000 a year received at the end of each of the next six years?
2. What is the present value of taking a \$50,000 lump sum now?
3. What is the present value of a \$85,000 lump sum taken in 7 years?

- 115) Solve the following two cases (the cases are independent). 115) _____
1. If you invest \$4,000 today at 10% interest, what is the value of the investment at the end of 10 years?
 2. If you invest \$1,000 at the end of each of the next 5 years and the investment earns 10% interest, what is the value of the investment at the end of 5 years?

- 116) Assume that you want to retire early at age 55. You plan to save using one of the following strategies: (1) save \$4,000 a year in an RRSP beginning when you are 25 and ending when you are 55 (30 years) or (2) wait until you are 40 to start saving and then save \$8,000 per year for the next 15 years. Assume that you will earn the historic stock market average of 10% per year. 116) _____
- How much savings will you have accumulated at age 55 under the two options?

- 117) Assume that you want to retire early at age 55. You plan to save using one of the following strategies: (1) save \$4,000 a year in an RRSP beginning when you are 25 and ending when you are 55 (30 years) or (2) wait until you are 40 to start saving and then save \$8,000 per year for the next 15 years. Assume that you will earn the historic stock market average of 8% per year. 117) _____
- How much savings will you have accumulated at age 55 under the two options?

- 118) Assume that you want to retire early at age 60. You plan to save using one of the following strategies: (1) save \$2,000 a year in an RRSP beginning when you are 20 and ending when you are 60 (40 years) or (2) wait until you are 40 to start saving and then save \$8,000 per year for the next 20 years. Assume that you will earn the historic stock market average of 10% per year. 118) _____
- How much savings will you have accumulated at age 55 under the two options?

- 119) Assume that you want to retire early at age 60. You plan to save using one of the following strategies: (1) save \$2,000 a year in an RRSP beginning when you are 20 and ending when you are 60 (40 years) or (2) wait until you are 40 to start saving and then save \$8,000 per year for the next 20 years. Assume that you will earn the historic stock market average of 8% per year. 119) _____
- How much savings will you have accumulated at age 55 under the two options?

- 120) Assume you want to retire with \$1,000,000 in your RRSP at age 60. You estimate that you can save \$2,400 a year (\$200 per month) beginning when you are 30. If you estimate that your RRSP will grow at 12% per year, will you achieve your goal? 120) _____

- 121) Assume you want to retire with \$1,500,000 in your RRSP at age 65. You estimate that you can save \$2,000 a year beginning when you are 25. If you estimate that your RRSP will grow at 12% per year, will you achieve your goal? 121) _____
- 122) Assume you want to retire with \$1,500,000 in your RRSP at age 65. You estimate that you can save \$1,200 a year beginning when you are 25, or start saving \$4,000 when you are 40. If you estimate that your RRSP will grow at 12% per year, will either scenario achieve your goal? 122) _____
- 123) Assume you want to retire with \$1,000,000 in your RRSP at age 65. You estimate that you can save \$1,200 a year beginning when you are 25. When you are 50 you will be able to save \$4,000 a year. If you estimate that your RRSP will grow at 12% per year, will you achieve your goal? 123) _____
- 124) Your best friend just received a gift of \$10,000 from his favourite aunt. He wants to save the money to open his own business after school. He can (1) invest it risk-free at 3%, (2) take on moderate risk at 8%, or (3) take on high risk at 16%. Help your friend project the investment's worth at the end of four years under each investment strategy and explain the results to him. 124) _____
- 125) Your best friend just received a gift of \$12,000 from his favourite aunt. He wants to save the money to open his own business after school. He can (1) invest it risk-free at 3%, (2) take on moderate risk at 8%, or (3) take on high risk at 16%. Help your friend project the investment's worth at the end of four years under each investment strategy and explain the results to him. 125) _____
- 126) Your best friend just received a gift of \$10,000 from his favourite aunt. He wants to save the money to open his own business after school. He can (1) invest it risk-free at 3%, (2) take on moderate risk at 6%, or (3) take on high risk at 18%. Help your friend project the investment's worth at the end of five years under each investment strategy and explain the results to him. 126) _____
- 127) Your best friend just received a gift of \$12,000 from his favourite aunt. He wants to save the money to open his own business after school. He can (1) invest it risk-free at 3%, (2) take on moderate risk at 6%, or (3) take on high risk at 18%. Help your friend project the investment's worth at the end of five years under each investment strategy and explain the results to him. 127) _____
- 128) Annet wants to take the next five years off work to travel around the world. She estimates annual cash needs at \$40,000 (if she needs more, she'll work odd jobs). Annet believes she can invest her savings at 10% until she depletes her funds. 128) _____

How much money does Annet need now to fund her travels?

129) Jerome wants to take the next three years off work to travel around the world. He estimates annual cash needs at \$35,000 (if he needs more, he'll work odd jobs). Jerome believes he can invest his savings at 6% until he depletes his funds. 129) _____

How much money does Jerome need now to fund his travels?

130) James wants to take the next three years off work to travel around the world. He estimates annual cash needs at \$30,000 (if he needs more, he'll work odd jobs). James believes he can invest his savings at 10% until he depletes his funds. 130) _____

How much money does James need now to fund his travels?

131) An accounting student in her first year of college who is working on a 4-year degree receives from her parents \$200 in her first year. As an incentive to encourage her to graduate, they promise that in the second year she will receive double the amount of the first year, and in the third year she will receive double the amount of the second year. In her fourth year, she will receive \$1,000. If she invests her yearly gifts at a rate of 4% as she receives them, compare the value of the investment after five years with the value of the gift (present value). What is the investment loss if the gift is not invested? 131) _____

132) Jennifer recently earned a degree in accounting and her first employment opportunity is an accountant at a major corporation. The RRSP portion of her employment package has a personal investment cap at 20% of her salary and the employer contribution portion is 50% of her contribution. Her annual salary is \$56,500 and she chose to invest 14% annually. Calculate the value of her RRSP value after 10 years at 4%, and then calculate the value of her RRSP had she invested the maximum amount that her employer would match. 132) _____

TRUE/FALSE. Write 'T' if the statement is true and 'F' if the statement is false.

133) Net present value and the payback period are examples of discounted cash flow models used in capital budgeting decisions. 133) _____

134) In calculating the net present value of an investment in equipment, the required investment and its terminal residual value should be subtracted from the present value of all future cash inflows. 134) _____

135) The profitability index equals the present value of net cash inflows from the investment divided by the cost of the investment. 135) _____

136) The residual value is not considered in a NPV computation. 136) _____

137) A series of equal payments or deposits made at equal time intervals are called annuities. 137) _____

138) The interest rate that makes the net present value of the investment equal to zero is the internal rate of return. 138) _____

- 139) The internal rate of return is used as the discount rate when calculating the net present value of a project. 139) _____
- 140) When evaluating capital investment projects, if the internal rate of return is less than the required rate of return, the project will be rejected. 140) _____
- 141) When selecting a capital investment project from three alternatives, the project with the highest net present value will always be preferable. 141) _____
- 142) When evaluating the cash flows from an investment, a reduction in cash flows is also considered. 142) _____
- 143) NPV analysis allows a company to make an "apples to apples" comparison of cash flows at the same point in time. 143) _____
- 144) When the profitability index is greater than 1.00 for a project, that project has a positive net present value. 144) _____
- 145) Discount rate, hurdle rate, and required rate of return have the same meaning when calculating net present value. 145) _____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

- 146) A project has an internal rate of return which is equal to the company's discount rate. The project's profitability index
 A) would be 0.0.
 B) would be 1.0.
 C) would be 0.5.
 D) cannot be determined from information provided. 146) _____
- 147) If the discount rate is increased from 8% to 10%, what will happen to the net present value (NPV) of a project (assume all future cash flows are positive)?
 A) The discount rate change will not affect NPV.
 B) NPV will always decrease.
 C) NPV will always increase.
 D) We cannot determine the direction of the effect on NPV from the information provided. 147) _____
- 148) If the discount rate is decreased from 10% to 8%, what will happen to the net present value (NPV) of a project (assume all future cash flows are positive)?
 A) NPV will always decrease
 B) The change will not affect NPV
 C) NPV will always increase
 D) There is insufficient information to determine the answer 148) _____

- 149) If the discount rate is decreased from 9% to 7%, what will happen to the internal rate of return (IRR) of a project? 149) _____
- A) IRR will always increase.
 - B) The discount rate change will not affect IRR.
 - C) IRR will always decrease.
 - D) We cannot determine the direction of the effect on IRR from the information provided.
- 150) A company finds that the residual value of \$10,000 for the equipment in a capital budgeting project has been inadvertently omitted from the calculation of the net present value (NPV) for that project. How does this omission affect the NPV of that project? 150) _____
- A) The project's NPV should be lower, but be less than \$10,000 lower, with the residual value included.
 - B) The project's NPV should be \$10,000 lower with the residual value included.
 - C) The project's NPV should be higher, but be less than \$10,000 higher, with the residual value included.
 - D) The project's NPV should be \$10,000 higher with the residual value included.
- 151) In computing the IRR of an investment, a company would not consider 151) _____
- A) depreciation on the assets of the project.
 - B) the cost of the project.
 - C) predicted cash inflows over the life of the project.
 - D) present value factors.
- 152) Mansfield Motors is evaluating a capital investment opportunity. This project would require an initial investment of \$30,000 to purchase one machine and \$10,000 to purchase the other machine (both machines are required). The project equipment will have a residual value at the end of its life of \$3,000. The useful life of the equipment is 5 years. The new project is expected to generate additional net cash inflows of \$12,000 per year for each of the five years. Mansfield Motors' required rate of return is 14%. The net present value of this project is closest to 152) _____
- A) \$1,196. B) \$(361). C) \$26,386. D) (\$3,994).
- 153) Stensels, a plastics processor, is considering the purchase of a high-speed extruder as one option. The new extruder would cost \$50,000 and would have a residual value of \$5,000 at the end of its 8 year life. The annual operating expenses of the new extruder would be \$8,000. The other option that Stensels has is to rebuild its existing extruder. The rebuilding would require an investment of \$30,000 and would extend the life of the existing extruder by 8 years. The existing extruder has annual operating costs of \$11,000 per year and does not have a residual value. Stensels' discount rate is 14%. Using net present value analysis, which option is the better option and by how much? 153) _____
- A) Better by \$4,330 to purchase new extruder
 - B) Better by \$6,083 to rebuild existing extruder
 - C) Better by \$4,330 to rebuild existing extruder
 - D) Better by \$6,083 to purchase new extruder

- 154) Home Products, Inc. is evaluating the purchase of a new machine to use in its manufacturing process. The new machine would cost \$40,000 and have a useful life of 6 years. At the end of the machine's life, it would have a residual value of \$2,500. Annual cost savings from the new machine would be \$12,400 per year for each of the six years of its life. Home Products, Inc. has a minimum required rate of return of 16% on all new projects. The net present value of the new machine would be closest to 154) _____
- A) \$5,694. B) \$6,719. C) \$46,719. D) \$4,669.

- 155) Baker Enterprises is evaluating the purchase of a new computer network system. The new system would cost \$24,000 and have a useful life of 6 years. At the end of the system's life, it would have a residual value of \$3,000. Annual operating cost savings from the new system would be \$8,800 per year for each of the six years of its life. Baker Enterprises has a minimum required rate of return of 12% on all new projects. The net present value of the new network system would be closest to 155) _____
- A) \$37,698. B) \$13,698. C) \$10,656. D) \$12,177.

- 156) Camtash Corporation is considering the purchase of a machine that would cost \$21,628 and would have a useful life of 5 years. The machine would generate \$6,300 of net annual cash inflows per year for each of the 5 years of its life. The internal rate of return on the machine would be closest to 156) _____
- A) 10%. B) 14%. C) 12%. D) 8%.

- 157) Salvador Corporation is considering the purchase of a special blow-molding machine that would cost \$64,366 and would have a useful life of 8 years. The machine would generate \$11,200 of net annual cash inflows per year for each of the 8 years of its life. The internal rate of return on the machine would be closest to 157) _____
- A) 10%. B) 14%. C) 8%. D) 12%.

- 158) Lombard Corporation is evaluating the purchase of a new machine that would have an initial cost of \$120,000. This new machine would have a profitability index of 1.25. The company's discount rate is 12%. What is the present value of the net cash inflows of the new machine project? 158) _____
- A) \$1,000,000 B) \$150,000 C) \$14,400 D) \$96,000

- 159) Speedy Company has three potential projects from which to choose. Selected information on each of the three projects follows: 159) _____

	Project A	Project B	Project C
Investment required	\$42,500	\$65,800	\$53,700
Present value of net cash inflows	\$45,700	\$75,400	\$70,200

Using the profitability index, rank the projects from most profitable to least profitable.

- A) C, B, A B) B, A, C C) A, B, C D) B, C, A
- 160) Copper Creations is evaluating a project that would require an initial investment of \$36,000. The present value of the net cash inflows associated with this project would be \$43,920. The profitability index for this project would be closest to 160) _____
- A) 1.22. B) 4.55. C) 0.82. D) 0.22.

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

Miami Marine Enterprises is evaluating the purchase of an elaborate hydraulic lift system for all of its locations to use for the lift trucks brought in for repair. The company has narrowed their choices down to two: the B14 Model and the F54 Model. Financial data for the two choices follows:

	B14 Model	F54 Model
Investment	\$320,000	\$240,000
Useful life (years)	8	8
Estimated annual net cash inflows for useful life	\$75,000	\$40,000
Residual value	\$30,000	\$10,000
Depreciation method	Straight-line	Straight-line
Required rate of return	14%	10%

- 161) The present value of future cash inflows from the F54 Model is closest to 161) _____
 A) \$213,400. B) \$218,070. C) \$(21,930). D) \$190,230.
- 162) The present value of future cash inflows from the B14 Model is closest to 162) _____
 A) \$38,455. B) \$358,455. C) \$410,655. D) \$218,070.
- 163) The net present value of the F54 Model is closest to 163) _____
 A) \$218,070 positive. B) \$178,070 positive.
 C) \$38,455 positive. D) \$21,930 negative.
- 164) The net present value of the B14 Model is closest to 164) _____
 A) \$21,930 negative. B) \$38,455 positive.
 C) \$358,455 positive. D) \$17,395 positive.
- 165) Using the net present value model, which alternative should Miami Marine Enterprises select? 165) _____
 A) The B14 Model should be selected. B) The F54 Model should be selected.
 C) Both investments should be selected. D) Neither investment should be selected.

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

Moreno Corporation is considering investing in specialized equipment costing \$525,000. The equipment has a useful life of 5 years and a residual value of \$55,000. Depreciation is calculated using the straight-line method. The expected net cash inflows from investment are:

Year 1	\$245,000
Year 2	\$190,000
Year 3	\$152,000
Year 4	\$112,000
Year 5	\$95,000
	\$794,000

Moreno Corporation's required rate of return is 14%.

- 166) The net present value of the Moreno Corporation's investment is closest to 166) _____
- A) \$269,000 positive. B) \$54,184 positive.
C) \$25,639 positive. D) \$82,729 positive.
- 167) Is the internal rate of return of the Moreno Corporation investment equal to, higher than, or lower than 14%? 167) _____
- A) Lower than 14%
B) Equal to 14%
C) Higher than 14%
D) Cannot be determined from the given data

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

Sommer Corporation is deciding whether to automate one phase of its production process. The equipment has a six-year life and will cost \$410,000. Projected net cash inflows from the equipment are as follows:

Year 1	\$115,000
Year 2	\$100,000
Year 3	\$110,000
Year 4	\$100,000
Year 5	\$95,000
Year 6	\$90,000

Sommer Corporation's hurdle rate is 12%. Assume the residual value is zero.

- 168) The net present value of the Sommer Corporation equipment is closest to 168) _____
- A) \$15,000. B) \$13,810. C) \$(13,810). D) \$2,302.
- 169) If Sommer Corporation decides to refurbish the equipment at a cost of \$50,000 at the end of year 6, it could be used for one more year and would have a \$30,000 residual value at the end of year 7. Assume the cash inflow in year 7 is \$65,000. The NPV of just the refurbishment is closest to 169) _____
- A) \$41,170. B) \$17,590. C) \$4,030. D) \$15,820.

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

Williams Department Stores is considering two possible expansion plans. One proposal involves opening 5 stores in Manitoba at a cost of \$1,800,000. Under the other proposal, the company would focus on Alberta and open 6 stores at a cost of \$2,400,000. The following information is available:

	Manitoba proposal	Alberta proposal
Required investment	\$1,800,000	\$2,400,000
Estimated life	10 years	10 years
Estimated residual value	\$50,000	\$80,000
Estimated annual cash inflows over the next 10 years	\$400,000	\$500,000
Required rate of return	10%	10%

170) The net present value of the Manitoba proposal is closest to 170) _____
 A) \$677,300. B) \$461,650. C) \$1,291,800. D) \$658,000.

171) The net present value of the Alberta proposal is closest to 171) _____
 A) \$677,300. B) \$684,600. C) \$672,500. D) \$703,380.

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

Corky's Amusement Park is evaluating the purchase of a new game to be located on its Midway. Corky's has narrowed their choices down to two: the Wacky Water Race game and the Whack-A-Mole game. Financial data about the two choices follows.

	Wacky Water Race	Whack-A-Mole
Investment	\$32,000	\$22,000
Useful life	5	5
Estimated annual net cash inflows for 8 years	\$9,000	\$5,000
Residual value	\$2,000	\$1,000
Depreciation method	straight-line	straight-line
Required rate of return	8%	10%

172) The total present value of future cash inflows from the Whack-A-Mole game is closest to 172) _____
 A) \$41,576. B) \$19,576. C) \$20,586. D) \$18,955.

173) The total present value of future cash inflows from the Wacky Water Race game is closest to 173) _____
 A) \$5,299. B) \$37,299. C) \$19,576. D) \$35,481.

174) The net present value of the Whack-A-Mole game is closest to 174) _____
 A) \$3,937. B) (\$3,937). C) (\$2,424). D) \$2,424.

175) The net present value of the Wacky Water Race game is closest to 175) _____
 A) \$(3,045). B) \$5,299. C) \$(5,299). D) \$3,045.

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

Wet Water Company drills residential and commercial wells. The company is in the process of analyzing the purchase of a new drill. Information on the proposal is provided below:

Initial investment:	
Asset	\$56,000
Operations (per year for six years):	
Cash receipts	\$60,000
Cash expenditures	\$44,000
Disinvestment: Salvage value of drill (end of year six)	\$5,000
Discount rate 6 percent	

Note: Other than the initial investment, cash flows are end of period.

- 176) In what range is the internal rate of return for the Wet Water Company's new drill? 176) _____
 A) 18 percent to 21% B) 14 percent to 17 percent
 C) 10 percent to 13 percent D) greater than 21%
- 177) What is the net present value for the Wet Water Company's new drill? 177) _____
 A) \$25,002.48 B) \$14,922.62 C) \$26,201.99 D) \$29,766.40
- 178) Brown Corporation recently purchased a new machine for \$339,013.20. The new equipment has a useful life of 10 years. Net cash flows will be \$60,000 per year, end of year payments. What is the internal rate of return? 178) _____
 A) 14 percent B) 10 percent C) 12 percent D) 16 percent
- 179) Soda Manufacturing Company provides vending machines for soft drink manufacturers. The company has been investigating a new piece of machinery for its production department. The old equipment has a remaining life of 1 year and no sales value. The new equipment has a value of \$52,650 with a three-year life. The expected additional cash inflows are \$25,000 per year, end of year payments. What is the internal rate of return? 179) _____
 A) 24 percent B) 12 percent C) 20 percent D) 16 percent

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

Neptune Ltd. wants to expand its operations by manufacturing a new product line. New equipment will cost \$225,000. Incremental sales are estimated at \$150,000 per year for 6 years. Variable costs of producing the new product line are 52% of sales and incremental annual fixed costs are \$25,000. The equipment can be salvaged after 6 years for 16% of its original cost. The company's required rate of return for new projects is 18%. Ignore income taxes.

- 180) What is the net present value of the Neptune Ltd. investment? 180) _____
 A) \$93,000 B) (\$60,613) C) (\$47,277) D) (\$26,291)
- 181) What is the internal rate of return of the Neptune Ltd. investment? 181) _____
 A) 10.00% B) 12.75% C) 6.86% D) 13.62%

- 182) Shirt Company wants to purchase a new cutting machine for its sewing plant. The investment is expected to generate annual cash inflows of \$300,000 recognized at the end of each year. The required rate of return is 12 percent and the new machine is expected to last for 4 years. What is the maximum dollar amount Shirt Company would be willing to spend for the machine? 182) _____
 A) \$791,740 B) \$720,600 C) \$911,205 D) \$957,600
- 183) Weston Ltd. is considering investing in a new piece of equipment for its factory. It estimates that the machine will generate an additional \$120,000 per year in revenues. The contribution margin on these incremental revenues is estimated at 40%. Incremental annual operating costs are estimated to be \$8,200. The equipment would have a salvage value of \$14,000 at the end of 6 years. The company's required rate of return is 13%. What is the net present value of this investment if the equipment costs \$250,000? (Ignore income taxes.) 183) _____
 A) \$11,768 B) (\$51,393) C) \$2,800 D) (\$84,173)

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

- 184) Snow Mountain Sports makes snowboards. The company wants to add a new machine that would cost \$80,000 and have a useful life of 5 years and no residual value. The company expects the machine will generate \$23,000 annual cash inflows for 5 years. The discount rate is 10%. What is the net present value of the investment? 184) _____
- 185) John owns a golf course and wants to add some computers to the lounge. The computers would cost \$14,000 and would have a 3 year life and no residual value. John expects the computers to generate \$5,000 annual cash inflows for 3 years. The discount rate is 8%. What is the net present value of the investment? 185) _____
- 186) Maxwell Company is deciding whether to automate one phase of its production process. The equipment has a six year life and will cost \$450,000. The interest rate is 12%. Net cash inflow year: 186) _____

Year 1	\$80,000
Year 2	\$70,000
Year 3	\$95,000
Year 4	\$75,000
Year 5	\$84,000
Year 6	\$96,000

Required:

- What is the present value of the net inflow for year 1?
- What is the present value of the net inflow for year 5?

- 187) Golden Corporation is evaluating the purchase of an elaborate hydraulic lift system for all locations to use for the boats brought in for repair. The company has narrowed their choice down to two: the C23 Model and the Q12 Model. Financial data about the two choices follows:

187) _____

	C23	Q12
Investment	\$360,000	\$165,000
Useful life (years)	8	10
Estimated annual net cash inflows for useful life	\$80,000	\$25,000
Residual value	\$20,000	\$12,000
Depreciation method	straight-line	straight-line
Required rate of return	14%	10%

Required:

1. Calculate the net present value of the Q12 Model.
2. Calculate the net present value of the C23 Model.
3. Using the net present value method, which alternative should Golden Corporation select?

- 188) JE Trim is considering investing \$50,000 in a new molding planer that will have no residual value. The new equipment is expected to result in increased annual net cash inflows of \$10,000 per year for the next 10 years. Assuming that JE Trim Music uses an 8% hurdle rate, what is net present value (NPV) of the investment? Is this a favourable investment?

188) _____

- 189) Assume that Credit Valley's managers developed the following estimates concerning the expansion (all numbers assumed) of the executive golf course facilities:

189) _____

Number of additional golfers per day	60
Average number of days in season	140
Useful life of expansion (in years)	10
Average cash spent by golfers per day	\$250
Average variable cost of serving each golfer per day	\$100
Cost of expansion	\$6,000,000
Discount (hurdle) rate	12%
Residual value of investment	0

What is the project's IRR? Is the project an attractive investment? Justify your answer.

- 190) Assume that Credit Valley's managers developed the following estimates concerning the expansion (all numbers assumed) of the executive golf course facilities:

190) _____

Number of additional golfers per day	80
Average number of days in season	150
Useful life of expansion (in years)	10
Average cash spent by golfers per day	\$225
Average variable cost of serving each golfer per day	\$100
Cost of expansion	\$7,500,000
Discount (hurdle) rate	14%
Residual value of investment	0

What is the project's IRR? Is the project an attractive investment? Justify your answer.

- 191) Assume that the managers of Shaw's Creek developed the following estimates concerning expansion (all numbers assumed) of the executive golf course facilities:

191) _____

Number of additional golfers per day	100
Average number of days in season	150
Useful life of expansion (in years)	8
Average cash spent by golfers per day	\$225
Average variable cost of serving each golfer per day	\$100
Cost of expansion	\$7,500,000
Discount (hurdle) rate	14%
Residual value of investment	0

What is the project's IRR? Is the project an attractive investment? Justify your answer.

- 192) Assume that the managers of Shaw's Creek developed the following estimates concerning expansion (all numbers assumed) of the executive golf course facilities:

192) _____

Number of additional golfers per day	75
Average number of days in season	130
Useful life of expansion (in years)	8
Average cash spent by golfers per day	\$200
Average variable cost of serving each golfer per day	\$75
Cost of expansion	\$5,000,000
Discount (hurdle) rate	14%
Residual value of investment	0

What is the project's IRR? Is the project an attractive investment? Justify your answer.

- 193) Martin is considering a capital investment that costs \$680,000 and will provide the net cash inflows listed below.

193) _____

Year	Net Cash Inflow
1	350,000
2	250,000
3	200,000

Required:

1. Using a hurdle rate of 10%, find the net present value of the investment.
2. What is the internal rate of return of the capital investment?

- 194) Martin is considering a capital investment that costs \$900,000 and will provide the net cash inflows listed below.

194) _____

Year	Net Cash Inflow
1	450,000
2	350,000
3	250,000

Required:

1. Using a hurdle rate of 10%, find the Net present Value of the investment.
2. What is the Internal Rate of return of the capital investment?

- 195) Andrea is considering a capital investment that costs \$750,000 and will provide the net cash inflows listed below.

195) _____

Year	Net Cash Inflow
1	400,000
2	300,000
3	200,000

Required:

1. Using a hurdle rate of 10%, find the Net present Value of the investment.
2. What is the Internal Rate of return of the capital investment?

- 196) Andrea is considering a capital investment that costs \$1,000,000 and will provide the net cash inflows listed below.

196) _____

Year	Net Cash Inflow
1	500,000
2	450,000
3	250,000

Required:

1. Using a hurdle rate of 10%, find the Net present Value of the investment.
2. What is the Internal Rate of return of the capital investment?

- 197) Evergreen Manufacturing Company is deciding whether to install solar panels at its factor 197) _____
The equipment has a 6 year life and will cost \$20,000. The discount rate is 8%. Net cash sav
in utility costs:

Year 1	\$3,000
Year 2	\$3,200
Year 3	\$3,400
Year 4	\$4,000
Year 5	\$4,600
Year 6	\$5,000

What is the net present value of the project?

- 198) The Zero Machine Company is evaluating a capital expenditure proposal that requires an 198) _____
investment of \$20,960 and has predicted cash inflows of \$5,000 per year for 10 years. It wil
no
salvage value.

Required:

- Using a required rate of return of 16%, determine the net present value of the investme
proposal.
- Determine the proposals internal rate of return.

- 199) Next Service Centre is considering purchasing a new computer network for \$95,000. Its 199) _____
anticipated eight-year life will generate additional client revenue of \$33,000 annually with
operating costs, excluding depreciation, of \$15,000. At the end of eight years, it will have a
salvage value of \$14,500 and return \$5,000 in working capital. Taxes are not considered.

Required:

- If the company has a required rate of return of 14%, what is the net present value of th
proposed investment?
- What is the internal rate of return?

- 200) Anderson Equipment Manufacturing produces equipment for the natural gas industry. 200) _____
The company management is considering purchasing new controllers for the fabricating
machines. The new controllers are expected to increase efficiency and product quality.
The engineering staff estimate that annual net cash savings from increased efficiency will
be \$35,000 per year for four years. The existing controllers can be sold for \$8,000. The new
controllers have a purchase price of \$75,000 and will require installation costs in the
amount of \$4,500. The annual software contract for the new controllers is \$1,700; the
controllers will be depreciated using the straight-line method. The salvage value of the ne
controllers at the end of four years is estimated to be \$10,000. The company has a required
of return of 15%.

Required:

- Determine the net present value of the investment in the new controllers.
- Calculate the internal rate of return of the investment in the new controllers.

- 201) Lion Enterprises Inc. is evaluating 3 investment alternatives. Each alternative requires a cash outflow of \$102,000. The cash inflows are summarized below (ignore taxes): 201) _____

	Project A	Project B	Project C
Year 1	\$55,000	\$30,000	\$0
Year 2	\$40,000	\$30,000	\$0
Year 3	\$20,000	\$30,000	\$45,000
Year 4	\$5,000	\$30,000	\$55,000
Year 5	\$2,000	\$30,000	\$65,000

The company has a required rate of return of 9%.

Required:

Evaluate and rank each alternative using net present value (NPV).

Use the information below to answer the following questions:

Atlantic Playland is considering purchasing a water park facility on leased land in Nova Scotia for \$1,800,000. The new facility will generate annual net cash inflows of \$600,000 for eight years (at the same time the land lease will expire). Engineers estimate that the facility will remain useful for eight years and have no residual value. The company uses straight-line depreciation. Its owners want payback in less than five years and an ARR of 10% or more. Management uses a 12% hurdle rate on investments of this nature.

- 202) Compute the payback period for Atlantic Playland. 202) _____
- 203) Compute the Accounting Rate of Return for Atlantic Playland. 203) _____
- 204) Compute the Net Present Value for this project. 204) _____
- 205) Compute the Internal Rate of Return for this Project. 205) _____
- 206) Would you recommend investing in this project? Why or Why not? 206) _____

TRUE/FALSE. Write 'T' if the statement is true and 'F' if the statement is false.

- 207) Neither the payback period nor the ARR capital budgeting method recognizes the time value of money. 207) _____
- 208) The payback and accounting rate of return models are conceptually better than the discounted cash flow models because they are based on cash flows, and they consider both profitability and the time value of money. 208) _____
- 209) The net present value model differs from the IRR model in that it does not show the project's unique rate of return. 209) _____

- 210) The discounted cash flow methods for capital budgeting are generally considered superior to the payback period and the ARR because they consider the time value of money. 210) _____
- 211) The Internal Rate of Return and the Accounting Rate of Return are the only recognized capital budgeting methods. 211) _____
- 212) Capital budgeting methods will not work with unequal cash flows during the capital asset's life. Other methods must be utilized in those cases. 212) _____
- 213) Capital budgeting techniques such as payback method and net present value are based upon Generally Accepted Accounting Principles (GAAP) and accrual accounting. 213) _____
- 214) The net present value method is preferable over the internal rate of return method when an organization does not require the same rate of return each year of the project. 214) _____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

- 215) When the present value of expected cash inflows from a project equals the present value of expected cash outflows of a project, the discount rate is the 215) _____
 A) net present value rate. B) required rate.
 C) hurdle rate. D) internal rate of return.
- 216) A company is evaluating a variety of different capital investment opportunities. The company can only choose one project due to limited funds. What would be the best capital budgeting method for this company to use to select a project? 216) _____
 A) Profitability index B) Net present value method
 C) Accounting rate of return method D) Payback method
- 217) Which of the following capital budgeting methods uses accrual accounting income? 217) _____
 A) Internal rate of return method B) Net present value method
 C) Payback method D) Accounting rate of return method
- 218) Which of the following capital budgeting models is generally the simplest to compute? 218) _____
 A) Accounting rate of return B) Net present value
 C) Internal rate of return D) Payback
- 219) Which of the following capital budgeting methods is based on cash flows, profitability, and the time value of money? 219) _____
 A) Payback and accounting rate of return
 B) Payback and net present value
 C) Net present value and internal rate of return
 D) Accounting rate of return and internal rate of return

- 220) Which of the following is generally considered to be the most superior method for making capital budgeting decisions? 220) _____
 A) Net present value method B) Payback method
 C) Incremental method D) Accounting rate of return method
- 221) Which term below is best described as "management's minimum desired rate of return on an investment?" 221) _____
 A) Internal rate of return B) Payback return
 C) Discount rate D) Net present value
- 222) Which term below is best described as "a measure of profitability computed by dividing the average annual operating income by the amount of the investment?" 222) _____
 A) Accounting rate of return B) Discount rate
 C) Internal rate of return D) Net present value
- 223) Which term below is best described as the "rate of return that makes the NPV of a capital project equal to zero"? 223) _____
 A) Accounting rate of return B) Discount rate
 C) Internal rate of return D) Net present value
- 224) Which term below is best described as the "decision model that computes the difference between the present value of the investment's net cash inflows, using a desired rate of return, and the cost of the initial investment"? 224) _____
 A) Accounting rate of return B) Discount rate
 C) Internal rate of return D) Net present value

ESSAY. Write your answer in the space provided or on a separate sheet of paper.

- 225) What are the four alternative methods for evaluating capital budgeting projects? What is an advantage and disadvantage of each method?
- 226) Cast Iron Stove Company wants to buy a molding machine that can be integrated into its computerized manufacturing process. It has received three bids for the machine and related manufacturer's specifications. The range from \$3,500,000 to \$3,550,000. The estimated annual savings of the machines range from \$260,000 to \$270,000. The payback periods are almost identical and the net present values are all within \$8,000 of each other. The president just doesn't know what to do about which vendor to choose since all of the selection criteria are so close together.

Required:

What suggestions do you have for the president with regard to specific qualitative factors that could be considered?

- 227) The following table contains information about four projects in which Nova Corporation has the opportunity to invest. This information is based on estimates that different managers have prepared about their potential projects.

Project	Investment Required	Net Present Value	Life of Project	Internal Rate of Return	Profitability Index	Payback Period in Years	Accounting Rate of Return
A	\$ 220,000	\$ 52,350	5	22%	1.26	2.86	18%
B	\$ 395,000	\$ 72,230	6	25%	1.18	2.96	15%
C	\$ 975,000	\$200,075	3	20%	1.22	2.11	11%
D	\$1,000,000	\$ 85,000	4	13%	1.06	3.00	22%

Requirements

- Rank the four projects in order of preference by using the following:
 - Net present value
 - Internal rate of return
 - Payback period
 - Accounting rate of return
- Which method or methods do you think are best for evaluating capital investment projects in general? Why?

Answer Key

Testname: UNTITLED3

- 1) FALSE
- 2) TRUE
- 3) FALSE
- 4) FALSE
- 5) TRUE
- 6) TRUE
- 7) FALSE
- 8) TRUE
- 9) TRUE
- 10) FALSE
- 11) TRUE
- 12) A
- 13) B
- 14) D
- 15) A
- 16) A
- 17) A
- 18) The first step in the capital budgeting process is to identify potential investments—for example, new technology and equipment that may make the company more efficient, competitive, and profitable. Employees, consultants, and outside sales vendors often offer capital investment proposals to management.
The second step for managers is to project the investments' net cash inflows. As discussed previously, this step can be time consuming and difficult. However, managers make the best projections possible given the information they have.
The third step is to analyze the investments using one or more of the four methods of analysis (Payback Period, Accounting Rate of Return, Net Present Value, Internal Rate of Return).
The fourth step, capital rationing, involves choosing among alternative capital investments based on the availability of funds. That is, a company may not be able to pursue all good investments.
The fifth step is to perform post-audits of capital investments. After investing in the assets, companies compare the actual net cash inflows generated by the investment to the projected net cash inflows. Post-audits help companies determine whether the investments are going as planned and deserve continued support or whether they should abandon the project.
- 19) TRUE
- 20) FALSE
- 21) TRUE
- 22) TRUE
- 23) TRUE
- 24) FALSE
- 25) TRUE
- 26) TRUE
- 27) FALSE
- 28) FALSE
- 29) TRUE
- 30) FALSE
- 31) A

Answer Key

Testname: UNTITLED3

- 32) A
- 33) D
- 34) B
- 35) D
- 36) B
- 37) B
- 38) C
- 39) C
- 40) A
- 41) C
- 42) D
- 43) B
- 44) C
- 45) A
- 46) C
- 47) A
- 48) C
- 49) D
- 50) B
- 51) D
- 52) D
- 53) D
- 54) A
- 55) C
- 56) A
- 57) B
- 58) C
- 59) B
- 60) D
- 61) C
- 62) C
- 63) B
- 64) B
- 65) D
- 66) B
- 67) C
- 68) C
- 69) $\$90,000/\$25,000 = 3.60$ years
- 70) $\$90,000/\$15,000 = 6.00$ years
- 71) 8.00%
- 72) 4.17%
- 73) 10.98%
- 74) 24%

Answer Key

Testname: UNTITLED3

75) \$80,000

76) $\$240,000 / \$60,000 = 4$ years

77) Annual depreciation = $\$240,000 / 10 = \$24,000$

ARR = $(\$60,000 - \$24,000) / \$240,000 = 15\%$

78) $\$228,000 / \$40,000 = 5.7$ years

79) Annual depreciation = $\$228,000 / 6 = \$38,000$

ARR = $(\$70,000 - \$38,000) / \$228,000 = 14\%$

80)

Year	Annual Net Cash Inflow	Cumulative Net Cash Inflow
1	\$48,000	\$48,000
2	60,000	108,000
3	84,000	192,000
4	90,000	282,000
5	90,000	372,000
6	45,000	417,000

After three years, the company will have recovered \$192,000 of the \$228,000 initially invested. The company needs to recover an additional \$36,000 ($\$228,000 - \$192,000$) to reach payback. The company anticipates net cash inflows of \$90,000 in year 4.

Payback = 3 years + $(\$36,000 / \$90,000) = 3.4$ years

81) Accounting rate of return = $\frac{\text{Average annual net cash inflows} - \text{Annual Depreciation Expense}}{\text{Initial Investment}}$

$$\text{ARR} = \frac{\$69,500^a - \$38,000^b}{\$228,000}$$

$$\text{Accounting rate of return} = \frac{\$31,500}{\$228,000} = 13.80\%$$

^aAverage annual cash inflow = $\$417,000 / 6 = \$69,500$

^bAnnual depreciation = $\$228,000 / 6 = \$38,000$

82)

Year	Annual Net Cash Inflow	Cumulative Net Cash Inflow
1	\$90,000	\$90,000
2	90,000	180,000
3	72,000	252,000
4	96,000	348,000
5	120,000	468,000

After three years, the company will have recovered \$252,000 of the \$300,000 initially invested. The company needs to recover an additional \$48,000 ($\$300,000 - \$252,000$) to reach payback. The company anticipates net cash inflows of \$96,000 in year 4, so:

Payback = 3 years + $(\$48,000 / \$96,000) = 3.5$ years

Answer Key

Testname: UNTITLED3

$$83) \text{ Accounting rate of return} = \frac{\text{Average annual net cash inflows} - \text{Annual Depreciation Expense}}{\text{Initial Investment}}$$

$$\text{ARR} = \frac{\$93,600^a - \$60,000^b}{\$300,000}$$

$$\text{Accounting rate of return} = \frac{\$33,600}{\$300,000} = 11.20\%$$

^aAverage annual cash inflow = \$468,000/5 = \$93,600

^bAnnual depreciation = \$300,000/5 = \$60,000

84)

Year	Annual Net Cash Inflow	Cumulative Net Cash Inflow
1	\$90,000	\$90,000
2	90,000	180,000
3	65,000	245,000
4	55,000	300,000
5	24,000	324,000

After three years, the company will have recovered \$245,000 of the \$252,000 initially invested. The company needs to recover an additional \$7,000 (\$252,000 – \$245,000) to reach payback. The company anticipates net cash inflows of \$55,000 in year 4, so:

$$\text{Payback} = 3 \text{ years} + (7,000 / 55,000) = 3.13 \text{ years}$$

85)

$$\text{Accounting rate of return} = \frac{\text{Average annual net cash inflows} - \text{Annual Depreciation Expense}}{\text{Initial Investment}}$$

$$\text{ARR} = \frac{\$64,800^a - \$50,400^b}{\$252,000}$$

$$\text{Accounting rate of return} = \frac{\$14,400}{\$252,000} = 5.7\%$$

^aAverage annual cash inflow = \$324,000/5 = \$64,800

^bAnnual depreciation = \$252,000/5 = \$50,400

86) \$120,000

87) The payback period and ARR methods are simple and quick to compute, so managers often use them to screen out undesirable investments and to gain a more complete picture of the investment's desirability. However, both methods ignore the time value of money.

The payback period focuses on the time it takes for the company to recoup its cash investment but ignores all cash flows occurring after the payback period.

The ARR, however, measures the profitability of the asset over its entire life using accrual accounting figures. It is the method that uses accrual accounting rather than net cash inflows in its computations. This is important because many companies evaluate managers based on accounting rates of return.

88) TRUE

89) FALSE

90) TRUE

Answer Key

Testname: UNTITLED3

- 91) FALSE
 92) FALSE
 93) TRUE
 94) TRUE
 95) FALSE
 96) A
 97) A
 98) C
 99) C
 100) A
 101) D
 102) A
 103) C
 104) A
 105) C
 106) B
 107) D
 108) D
 109) D
 110) B
 111) D
 112) C
 113) A
 114) 1. $(\$10,000 \times 4.623) = \$46,230$; Calculator $\$46,228.80$
 2. $\$50,000$
 3. $(\$85,000 \times 0.583) = \$49,555$; Calculator $\$49,596.68$
 115) 1. $FV = \$4,000 \times 1.611 = \$6,444$; Calculator $\$6,442.04$
 2. $FVA = \$1,000 \times 6.105 = \$6,105$; Calculator $\$6,105.10$

116)

Future Value	=	Annuity \times (Annuity FV factor, $i = 10\%$, $n = 30$)
	=	$\$4,000 \times (164.490)$
	=	$\$657,960$; Calculator $\$657,976.09$

Future Value	=	Annuity \times (Annuity FV factor, $i = 10\%$, $n = 15$)
	=	$\$8,000 \times (31.772)$
	=	$\$254,176$; Calculator $\$254,179.85$

Answer Key

Testname: UNTITLED3

117)

Future Value	=	Annuity \times (Annuity FV factor, $i = 8\%$, $n = 30$)
	=	$\$4,000 \times (113.280)$
	=	$\$453,120$; Calculator $\$453,132.84$

Future Value	=	Annuity \times (Annuity FV factor, $i = 8\%$, $n = 15$)
	=	$\$8,000 \times (27.152)$
	=	$\$217,216$; Calculator $\$217,216.91$

118)

Future Value	=	Annuity \times (Annuity FV factor, $i = 10\%$, $n = 40$)
	=	$\$2,000 \times (442.590)$
	=	$\$885,180$; Calculator $\$885,185.11$

Future Value	=	Annuity \times (Annuity FV factor, $i = 10\%$, $n = 20$)
	=	$\$8,000 \times (57.275)$
	=	$\$458,200$; Calculator $\$458,200$

119)

Future Value	=	Annuity \times (Annuity FV factor, $i = 8\%$, $n = 40$)
	=	$\$2,000 \times (259.060)$
	=	$\$518,120$; Calculator $\$518,113.04$

Future Value	=	Annuity \times (Annuity FV factor, $i = 8\%$, $n = 20$)
	=	$\$8,000 \times (45.762)$
	=	$\$366,096$; Calculator $\$366,095.71$

120) No

Future Value	=	Annuity \times (Annuity FV factor, $i = 12\%$, $n = 30$)
	=	$\$2,400 \times (241.330)$
	=	$\$579,192$

121) Yes

Future Value	=	Annuity \times (Annuity FV factor, $i = 12\%$, $n = 40$)
	=	$\$2,000 \times (767.090)$
	=	$\$1,534,180$

122) No

Future Value	=	Annuity \times (Annuity FV factor, $i = 12\%$, $n = 40$)
	=	$\$1,200 \times (767.090)$
	=	$\$920,508$

Future Value	=	Annuity \times (Annuity FV factor, $i = 12\%$, $n = 24$)
	=	$\$4,000 \times (133.330)$
	=	$\$533,320$

Answer Key

Testname: UNTITLED3

123) Yes

Future Value	=	Annuity \times (Annuity FV factor, $i = 12\%$, $n = 40$)
	=	$\$1,200 \times (767.090)$
	=	\$920,508

Future Value	=	Annuity \times (Annuity FV factor, $i = 12\%$, $n = 15$)
	=	$\$(4,000 - \$1,200) \times (37.280)$
	=	\$104,384

Future Value of \$1,200 for 40 years + Future Value of the additional \$2,800 for 15 years.

$$\$920,508 + \$104,384 = \$1,024,892$$

124)

Future Value	=	Investment \times (FV factor, $i = x$, $n = 4$)
At 3%:		
Future Value	=	$\$10,000 \times (1.126)$
	=	\$11,260; Calculator \$11,255.09
At 8%:		
Future Value	=	$\$10,000 \times (1.360)$
	=	\$13,600; Calculator \$13,604.89
At 16%:		
Future Value	=	$\$10,000 \times (1.811)$
	=	\$18,110; Calculator \$18,106.39

As the interest rate rises, the future value of the investment rises. However, the investments with higher interest rates are also riskier. Because of the higher risk, your friend stands a greater chance of losing his money in the 16% investment than he does with the alternate investments. His choice between investments will depend on how much risk he is willing to bear.

125)

Future Value	=	Investment \times (FV factor, $i = x$, $n = 4$)
At 3%:		
Future Value	=	$\$12,000 \times (1.126)$
	=	\$13,512; Calculator \$13,506.11
At 8%:		
Future Value	=	$\$12,000 \times (1.360)$
	=	\$16,320; Calculator \$16,325.87
At 16%:		
Future Value	=	$\$12,000 \times (1.811)$
	=	\$21,732; Calculator \$21,727.67

As the interest rate rises, the future value of the investment rises. However, the investments with higher interest rates are also riskier. Because of the higher risk, your friend stands a greater chance of losing his money in the 16% investment than he does with the alternate investments. His choice between investments will depend on how much risk he is willing to bear.

Answer Key

Testname: UNTITLED3

126)

Future Value	=	Investment \times (FV factor, $i = x$, $n = 5$)
At 3%:		
Future Value	=	$\$10,000 \times (1.159)$
	=	$\$11,590$; Calculator $\$11,592.74$
At 6%:		
Future Value	=	$\$10,000 \times (1.338)$
	=	$\$13,380$; Calculator $\$13,382.26$
At 18%:		
Future Value	=	$\$10,000 \times (2.288)$
	=	$\$22,880$; Calculator $\$22,877.58$

As the interest rate rises, the future value of the investment rises. However, the investments with higher interest rates are also riskier. Because of the higher risk, your friend stands a greater chance of losing his money in the 18% investment than he does with the alternate investments. His choice between investments will depend on how much risk he is willing to bear.

127)

Future Value	=	Investment \times (FV factor, $i = x$, $n = 5$)
At 3%:		
Future Value	=	$\$12,000 \times (1.159)$
	=	$\$13,908$; Calculator $\$13,911.29$
At 6%:		
Future Value	=	$\$12,000 \times (1.338)$
	=	$\$16,056$; Calculator $\$16,058.71$
At 18%:		
Future Value	=	$\$12,000 \times (2.288)$
	=	$\$27,456$; Calculator $\$27,453.09$

As the interest rate rises, the future value of the investment rises. However, the investments with higher interest rates are also riskier. Because of the higher risk, your friend stands a greater chance of losing his money in the 18% investment than he does with the alternate investments. His choice between investments will depend on how much risk he is willing to bear.

128)

Present Value	=	Annuity \times (Annuity PV factor, $n = 5$, $i = 10\%$)
	=	$\$40,000 \times (3.791) = \$151,640$
	=	$\$151,640$; Calculator $\$151,631.47$

129)

Present Value	=	Annuity \times (Annuity PV factor, $n = 3$, $i = 6\%$)
	=	$\$35,000 \times (2.673)$
	=	$\$93,555$; Calculator $\$93,555.42$

Answer Key

Testname: UNTITLED3

130)

Present Value	=	Annuity × (Annuity PV factor, n = 3, i = 10%)
	=	\$30,000 × (2.487)
	=	\$74,610; Calculator \$74,605.56

131) -\$251.40

132) \$142,451.19; \$203,501.70

133) FALSE

134) FALSE

135) TRUE

136) FALSE

137) TRUE

138) TRUE

139) FALSE

140) TRUE

141) FALSE

142) TRUE

143) TRUE

144) TRUE

145) TRUE

146) B

147) B

148) C

149) B

150) C

151) A

152) B

153) C

154) B

155) B

156) B

157) C

158) B

159) A

160) A

161) B

162) B

163) D

164) B

165) A

166) D

167) C

168) B

Answer Key

Testname: UNTITLED3

169) B

170) A

171) D

172) B

173) B

174) C

175) B

176) A

177) C

178) C

179) C

180) C

181) A

182) C

183) D

184) $(\$23,000 \times 3.791) - \$80,000 = \$7,193$; Calculator: \$7,188.10

185) $(\$5,000 \times 2.577) - 14,000 = (\$1,115)$; Calculator: (\$1,114.52)

186) 1. $\$80,000 \times .893 = \$71,440$; Calculator: \$71,428.57

2. $\$84,000 \times .567 = \$47,628$; Calculator :\$47,663.86

Answer Key

Testname: UNTITLED3

187) Part 1:

Estimated annual net cash inflows for useful life	\$25,000
Present value of an annuity factor	5.335
Cash flow present value	\$133,375
Residual value	\$12,000
Present value of \$1 factor	0.467
Residual value present value	\$5,604
Cash flow present value	\$133,375
Residual value present value	\$5,604
Investment	\$(165,000)
Net present value for Q12 Model	\$(26,021)
Calculator	\$(26,028.76)

Part 2:

Estimated annual net cash inflows for useful life	\$80,000
Present value of an annuity factor	4.639
Cash flow present value	\$371,120
Residual value	\$20,000
Present value of \$1 factor	0.351
Residual value present value	\$7,020
Cash flow present value	\$371,120
Residual value present value	\$7,020
Investment	\$(360,000)
Net present value for C23 Model	\$18,140
Calculator	\$18,120.29

Part 3:

The C23 Model should be selected since it has a positive net present value. The Q12 Model should not be selected because its net present value is negative.

188)

	Annuity PV factor × Net Cash at 8% Inflow	Total Present Value
Present value of annuity of equal annual net cash inflows for 10 years at 8%	6.710 × \$10,000	\$67,100
Investment		\$(50,000)
Net present value of studios		\$(17,100)
Calculator		\$17,100.81

Since the NPV is positive, the studio investment provides JE Trim's minimum required rate of return. Therefore, the investment is favourable.

Answer Key

Testname: UNTITLED3

189) Average annual net cash inflow from expansion:

Average cash received from each golfer per day	\$250
Average variable cost of serving each golfer per day	(100)
Average net cash inflow per golfer per day	\$150
Number of additional golfers per day	× 60
Average net cash inflow per day	\$9,000
Number of golf days per year	× 140
Average annual net cash inflow per year	<u>\$1,260,000</u>

$$\frac{\text{Investment's cost}}{\text{Amount of each equal net cash inflow}} = \text{Annuity PV factor}$$

$$\frac{\$6,000,000}{\$1,260,000} = \text{Annuity PV factor (n = 10, i = ?)}$$

$$4.762 = \text{Annuity PV factor (n = 10, i = ?)}$$

Looking at the present value of an annuity table, we find that the project's Annuity PV factor of 4.762 falls between 18% factor = 4.494) and 16% (PV factor = 4.833). Thus, the IRR is somewhere between 16%-18%. Calculator IRR = 16.4%

The project is attractive since it will earn a higher return than the company's 14% hurdle rate.

190) Average annual net cash inflow from expansion:

Average cash received from each golfer per day	\$225
Average variable cost of serving each golfer per day	(100)
Average net cash inflow per golfer per day	\$125
Number of additional golfers per day	× 80
Average net cash inflow per day	\$10,000
Number of golf days per year	× 150
Average annual net cash inflow per year	<u>\$1,500,000</u>

$$\frac{\text{Investment's cost}}{\text{Amount of each equal net cash inflow}} = \text{Annuity PV factor}$$

$$\frac{\$7,500,000}{\$1,500,000} = \text{Annuity PV factor (n = 10, i = ?)}$$

$$5.00 = \text{Annuity PV factor (n = 10, i = ?)}$$

Looking at the present value of an annuity table, we find that the project's Annuity PV factor of 5.00 falls between 14% factor = 5.216) and 16% (PV factor = 4.833). Thus, the IRR is somewhere between 14-16%. Calculator IRR = 15.1%

The project is attractive since it will earn a higher return than the company's 14% hurdle rate.

Answer Key

Testname: UNTITLED3

191) Average annual net cash inflow from expansion:

Average cash received from each golfer per day	\$225
Average variable cost of serving each golfer per day.	(100)
Average net cash inflow per golfer per day	\$125
Number of additional golfers per day	× 100
Average net cash inflow per day	\$12,500
Number of golf days per year	× 150
Average annual net cash inflow per year	<u>\$1,875,000</u>

$$\frac{\text{Investment's cost}}{\text{Amount of each equal net cash inflow}} = \text{Annuity PV factor}$$

$$\frac{\$7,500,000}{\$1,875,000} = \text{Annuity PV factor (n = 8, i = ?)}$$

$$4.00 = \text{Annuity PV factor (n = 8, i = ?)}$$

Looking at the present value of an annuity table, we find that the project's Annuity PV factor of 4.00 falls between 18% factor = 4.078) and 20% (PV factor = 3.837). Thus, the IRR is somewhere between 18-20%. Calculator IRR = 18.62%

The project is attractive since it will earn a higher return than the company's 14% hurdle rate.

192) Average annual net cash inflow from expansion:

Average cash received from each golfer per day	\$200
Average variable cost of serving each golfer per day.	(75)
Average net cash inflow per golfer per day	\$125
Number of additional golfers per day	× 75
Average net cash inflow per day	\$9,375
Number of golf days per year	× 130
Average annual net cash inflow per year	<u>\$1,218,750</u>

$$\frac{\text{Investment's cost}}{\text{Amount of each equal net cash inflow}} = \text{Annuity PV factor}$$

$$\frac{\$5,000,000}{\$1,218,750} = \text{Annuity PV factor (n = 8, i = ?)}$$

$$4.102 = \text{Annuity PV factor (n = 8, i = ?)}$$

Looking at the present value of an annuity table, we find that the project's Annuity PV factor of 4.102 falls between 16% factor = 4.344) and 18% (PV factor = 4.078). Thus, the IRR is somewhere between 16-18%. Calculator IRR = 17.8%

The project is attractive since it will earn a higher return than the company's 14% hurdle rate.

Answer Key

Testname: UNTITLED3

193) Requirement 1

Present value	=	Cash flow × (PV factor, i = 10%, n = 1,2,3)	
Year 1	=	\$350,000 × 0.909 =	\$318,150
Year 2	=	\$250,000 × 0.826 =	206,500
Year 3	=	\$200,000 × 0.751 =	150,200
		Total Present value	\$674,850
		Less: Investment	(680,000)
		Net Present Value (NPV)	<u>\$(5,150)</u>
		Calculator	<u><u>\$(4,943.65)</u></u>

Requirement 2

The IRR is the interest rate at which the investment's NPV = 0. Since the NPV was negative at 10% (in part 1), we'll try next.

Present value	=	Cash flow × (PV factor, i = 8%, n = 1,2,3)	
Year 1	=	\$350,000 × 0.926 =	\$324,100
Year 2	=	\$250,000 × 0.857 =	214,250
Year 3	=	\$200,000 × 0.794 =	158,800
		Total Present value	\$697,150
		Less: Investment	(680,000)
		Net Present Value (NPV)	<u>\$17,150</u>

Since the NPV is positive, the IRR must be greater than 8% and less than 10%. Calculator IRR = 9.54%

Answer Key

Testname: UNTITLED3

194) Requirement 1

Present value	=	Cash flow × (PV factor, i = 10%, n = 1,2,3)	
Year 1	=	\$450,000 × 0.909 =	\$409,050
Year 2	=	\$350,000 × 0.826 =	289,100
Year 3	=	\$250,000 × 0.751 =	<u>187,750</u>
		Total Present value	\$885,900
		Less: Investment	<u>(900,000)</u>
		Net Present Value (NPV)	<u>\$(14,100)</u>
		Calculator	<u><u>\$(13,824.19)</u></u>

Requirement 2

The IRR is the interest rate at which the investment's NPV = 0. Since the NPV was negative at 10% (in part 1), we'll try next.

Present value	=	Cash flow × (PV factor, i = 8%, n = 1,2,3)	
Year 1	=	\$450,000 × 0.926 =	\$416,700
Year 2	=	\$350,000 × 0.857 =	299,950
Year 3	=	\$250,000 × 0.794 =	<u>198,500</u>
		Total Present value	\$915,150
		Less: Investment	<u>(900,000)</u>
		Net Present Value (NPV)	<u><u>\$15,150</u></u>

Since the NPV is positive, the IRR must be greater than 8% and less than 10%. Calculator IRR = 9.03%

Answer Key

Testname: UNTITLED3

195) Requirement 1

Present value	=	Cash flow × (PV factor, i = 10%, n = 1,2,3)	
Year 1	=	\$400,000 × 0.909 =	\$363,600
Year 2	=	\$300,000 × 0.826 =	247,800
Year 3	=	\$200,000 × 0.751 =	<u>150,200</u>
		Total Present value	\$761,600
		Less: Investment	<u>(750,000)</u>
		Net Present Value (NPV)	<u>\$11,600</u>
		Calculator	<u>\$11,833.21</u>

Requirement 2

The IRR is the interest rate at which the investment's NPV = 0. Since the NPV was positive at 10% (in part 1), we'll try 12% next.

Present value	=	Cash flow × (PV factor, i = 12%, n = 1,2,3)	
Year 1	=	\$400,000 × 0.893 =	\$357,200
Year 2	=	\$300,000 × 0.797 =	239,100
Year 3	=	\$200,000 × 0.712 =	<u>142,400</u>
		Total Present value	\$738,700
		Less: Investment	<u>(750,000)</u>
		Net Present Value (NPV)	<u>\$(11,300)</u>

Since the NPV is negative, the IRR must be less than 12% and greater than 10%. Calculator IRR = 11.01%

Answer Key

Testname: UNTITLED3

196) Requirement 1

Present value	=	Cash flow × (PV factor, i = 10%, n = 1,2,3)	
Year 1	=	\$500,000 × 0.909 =	\$454,500
Year 2	=	\$450,000 × 0.826 =	371,700
Year 3	=	\$250,000 × 0.751 =	187,750
		Total Present value	\$1,013,450
		Less: Investment	(1,000,000)
		Net Present Value (NPV)	\$13,450
		Calculator	\$14,274.98

Requirement 2

The IRR is the interest rate at which the investment's NPV = 0. Since the NPV was positive at 10% (in part 1), we'll try 12% next.

Present value	=	Cash flow × (PV factor, i = 12%, n = 1,2,3)	
Year 1	=	\$500,000 × 0.893 =	\$446,500
Year 2	=	\$450,000 × 0.797 =	358,650
Year 3	=	\$250,000 × 0.712 =	178,000
		Total Present value	\$983,150
		Less: Investment	(1,000,000)
		Net Present Value (NPV)	\$(16,850)

Since the NPV is negative, the IRR must be less than 12% and greater than 10%. Calculator IRR = 10.9%

197) Calculator \$(2,558.06)

198) a. Initial investment \$(20,960.00)
 Pmt = 5,000; n = 10, i = 16 24,166.14
 Net present value \$3,206.14

b. Present value factor of an annuity of \$1.00 = \$20,960/\$5,000 = 4.192.

From the annuity table, the 4.192 factor is closest to the 10-year row at the 20% column. Therefore, the IRR is 20%; or, using a calculator: 20.0033%

Answer Key

Testname: UNTITLED3

199) a.

	Predicted Cash Flows	Year(s)	PV Factor	PV of Cash Flows
Initial investment	\$(95,000)	0	1.000	\$(95,000)
Annual operations, net	18,000	1 - 8	4.639	83,502
Salvage value, work cap	14,500	8	0.351	<u>5,090</u>
Net present value				<u><u>\$(6,408)</u></u>

b. Trial and error is necessary. You know it is below 14% because the answer to Part A was negative and, therefore, I than the discount rate. Therefore, let's try 12%.

	Predicted Cash Flows	Year(s)	PV Factor	PV Of Cash Flows
Initial investment	\$(95,000)	0	1.000	\$(95,000)
Annual operations, net	18,000	1 - 8	4.968	89,424
Salvage value, work cap	14,500	8	0.404	<u>5,858</u>
Net present value				<u><u>\$ 282</u></u>

The (almost) zero net present value indicates an internal rate of return of approximately 12%.

200) $CF_0 = \$8,000 - \$75,000 - \$4,500 = - \$71,500$

$CF_{1-3} = \$35,000 - \$1,700 = \$33,300$

$CF_4 = \$33,300 + \$10,000 = \$43,300$

a. NPV calculator = \$ 29,288.31

b. IRR calculator = 33.3%

201) Project A

NPV = \$2,411.57

$CF_0 - \$102,000$ $CF_1 = \$55,000$ $CF_2 = \$40,000$ $CF_3 = \$20,000$ $CF_4 = \$5,000$ $CF_5 = \$2,000$

Or individual cash flows PV = \$50,458.72 + \$33,667.20 + \$15,443.67 + \$3,542.13 + \$1,299.86 = \$104,411.58

$\$104,411.58 - \$102,000 = \$2,411.58$

Project B

NPV = \$14,689.54

$CF_0 - \$102,000$ $CF_1 \text{ to } 5 = \$30,000$

or PV of \$30,000 annuity 5n 9% = \$116,689.54

$\$116,689.54 - \$102,000 = \$14,689.54$

Project C

NPV = \$13,957.18

$CF_0 - \$102,000$ $CF_1 \text{ to } 2 = \$0$ $CF_3 = \$45,000$ $CF_4 = \$55,000$ $CF_5 = \$65,000$

or individual cash flows PV = \$0 + \$0 + \$34,748.26 + \$38,963.39 + \$42,245.54 = \$115,957.19

$\$115,957.19 - \$102,000 = \$13,957.19$

Ranking B #1, C#2, A#3

202) Amount Invested / Expected annual cash flows

$\$1,800,000 / \$600,000 = 3 \text{ years}$

Answer Key

Testname: UNTITLED3

203) Depreciation = \$1,800,000/8 = \$225,000

Average Operating Income / Amount Invested

$(\$600,000 - \$225,000) / \$1,800,000 = 20.83\%$

204)

	Annuity PV factor at i = 12%, n = 8	Total Present Value
Net present value:		
Present value of annuity of		
equal annual net cash		
inflows for 8 years at 12%	4.968 × \$600,000 per year =	\$ 2,980,800
Investment		(1,800,000)
Net present value		\$ 1,180,800

205) The positive NPV shows that the investment's rate of return is actually higher than 12%.

The internal rate of return is calculated as follows:

Investment's cost	=	Annuity PV factor (i = ?, n = ?)
Amount of each equal net cash inflow		
\$1,800,000	=	Annuity PV factor (i = ?, n = 8)
\$600,000		
3.00	=	Annuity PV factor (i = ?, n = 8)

Using the Present Value of Annuity of \$1 table (for n = 8), we find that 3.00 must be greater than 20% (3.837).

206) Invest in the project, because it has a positive net present value (an actual IRR of between 25—30%) and the payback period is shorter than five years. The ARR (21%) is also greater than 10% desired

207) TRUE

208) FALSE

209) TRUE

210) TRUE

211) FALSE

212) FALSE

213) FALSE

214) TRUE

215) D

216) A

217) D

218) D

219) C

220) A

Answer Key

Testname: UNTITLED3

221) C

222) A

223) C

224) D

225) The four methods are: 1. Net Present Value (NPV); 2. Internal Rate of Return (IRR); 3. Payback; and 4. Accrual Accounting Rate of Return (AARR). NPV has advantages in that it uses discounted cash flows, and can deal with uneven cash flows, considers the inflows and outflows of the project. A disadvantage of NPV is that the results indicate if it achieves a particular cost of capital or not, but it does not indicate what the rate of return actually is. The IRR method generates an expected rate of return for the investment given the time of the project and the discounting of cash flows. A disadvantage of the IRR is that the results are expressed in the form of a percentage rather than in dollars and it is difficult to use when the project has uneven cash flows. The payback is simple to use, and adapts to both even and uneven cash flows. It also highlights the liquidity of a project. A disadvantage to the payback is that it does not consider either the time value of money, or the cash flows that occur after the payback time period. The AARR method uses the information that is most often found in financial statements –including net income and depreciation. A drawback is that the method does not take into account the time value of money or the cash

226) The president needs to consider nonfinancial and qualitative factors between the three vendors. Quality of output units, manufacturing flexibility, and cycle time are all additional factors that can be considered about the machines. Other items might include worker safety, ease of learning and using, and ease of maintenance.

227) Requirement 1.

- a. Net present value: C, D, B, A
- b. Internal rate of return: B, A, C, D
- c. Payback period: C, A, B, D
- d. Accounting rate of return: D, A, B, C

Requirement 2.

Potential capital investments can be analyzed using five different methods (including the profitability index, which is a variation of the net present value method). Each method has its strengths and weaknesses; therefore, for optimal results companies generally use a combination of methods to make their final capital investment decisions. These methods include:

- 1) Net Present Value (NPV)—This method indicates profitability by comparing the present value of the investment's cash inflows with the cost of the investment (already stated at its present value). This method is superior because it incorporates the time value of money.

- 2) Profitability index—This method helps to compare the NPV across alternative investments of varying sizes.

- 3) Internal rate of return—This method also indicates profitability and incorporates the time value of money. This method will show us the actual rate of return being earned on the investment by equating the present value of the net cash inflows to the investment's cost. In other words, it is the interest rate that brings the investment's NPV to zero.