Principles of Corporate Finance 13th edition Brealey Test Bank

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Principles of Corporate Finance, 13e **(Brealey)**
Chapter 2 How to Calculate Present Values

1) The present value of $100 expected two years from today at a discount rate of 6 percent is
A) $112.36.
B) $106.00.
C) $100.00.
D) $89.00.

Answer: D
Explanation: PV = 100/(1.06^2) = 89.00.
Difficulty: 1 Easy
Topic: Net Present Value
Learning Objective: 02-01 Future Values and Present Values
Bloom's: Understand
AACSB: Analytical Thinking
Accessibility: Keyboard Navigation

2) Present value is defined as:
A) future cash flows discounted to the present by an appropriate discount rate.
B) inverse of future cash flows.
C) present cash flows compounded into the future.
D) future cash flows multiplied by the factor $(1 + r)^t$.

Answer: A
Difficulty: 1 Easy
Topic: Net Present Value
Learning Objective: 02-01 Future Values and Present Values
Bloom's: Understand
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Accessibility: Keyboard Navigation

3) If the annual interest rate is 12 percent, what is the two-year discount factor?
A) 0.7972
B) 0.8929
C) 1.2544
D) 0.8065

Answer: A
Explanation: DF2 = 1/(1.12^2) = 0.7972.
Difficulty: 1 Easy
Topic: Net Present Value
Learning Objective: 02-01 Future Values and Present Values
Bloom's: Understand
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4) If the present value of cash flow X is $240, and the present value of cash flow Y is $160, then the present value of the combined cash flows is:
A) $240.
B) $160.
C) $80.
D) $400.

Answer: D
Explanation: PV (x + y) = PV (x) + PV (y) = 240 + 160 = 400.
Difficulty: 2 Medium
Topic: Net Present Value
Learning Objective: 02-01 Future Values and Present Values
Bloom's: Understand
AACSB: Analytical Thinking
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5) The rate of return is also called the:
A) discount rate.
B) discount rate and hurdle rate only.
C) discount rate, hurdle rate, and opportunity cost of capital.
D) discount rate and opportunity cost of capital only.

Answer: C
Difficulty: 1 Easy
Topic: Net Present Value
Learning Objective: 02-01 Future Values and Present Values
Bloom's: Understand
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6) The present value of $121,000 expected one year from today at an interest rate (discount rate) of 10 percent per year is:
A) $121,000.
B) $100,000.
C) $110,000.
D) $108,900.

Answer: C
Explanation: PV = (121,000)/(1.10) = 110,000.
Difficulty: 1 Easy
Topic: Net Present Value
Learning Objective: 02-01 Future Values and Present Values
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7) The one-year discount factor, at a discount rate of 25 percent per year, is:
A) 1.25.
B) 1.0.
C) 0.8.
D) 0.75.

Answer: C
Explanation: Discount factor = 1/1.25 = 0.8.
Difficulty: 1 Easy
Topic: Net Present Value
Learning Objective: 02-01 Future Values and Present Values
Bloom's: Understand
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8) The one-year discount factor, at an interest rate of 100 percent per year, is:
A) 1.50.
B) 0.50.
C) 0.25.
D) 1.00.

Answer: B
Explanation: Discount factor = 1/(1 + 1.00) = 0.5.
Difficulty: 1 Easy
Topic: Net Present Value
Learning Objective: 02-01 Future Values and Present Values
Bloom's: Understand
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9) The present value of $100,000 expected at the end of one year, at a discount rate of 25 percent per year, is:
A) $80,000.
B) $125,000.
C) $100,000.
D) $75,000.

Answer: A
Explanation: PV = (100,000)/(1 + 0.25) = 80,000.
Difficulty: 1 Easy
Topic: Net Present Value
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10) If the one-year discount factor is 0.8333, what is the discount rate (interest rate) per year?
A) 10 percent
B) 20 percent
C) 30 percent
D) 40 percent

Answer: B
Explanation: DF = $1/(1 + r)^1 = 0.8333; 1 + r = 1/0.8333; r = 20\%$.
Difficulty: 1 Easy
Topic: Net Present Value
Learning Objective: 02-01 Future Values and Present Values
Bloom's: Understand
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11) If the present value of $480 to be paid at the end of one year is $400, what is the one-year discount factor?
A) 0.8333
B) 1.20
C) 0.20
D) 1.00

Answer: A
Explanation: Discount factor is = 400/480 = 0.8333.
Difficulty: 1 Easy
Topic: Net Present Value
Learning Objective: 02-01 Future Values and Present Values
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12) If the present value of $250 expected one year from today is $200, what is the one-year discount rate?
A) 10 percent
B) 20 percent
C) 25 percent
D) 30 percent

Answer: C
Explanation: $1 + r = 250/200 = 1.25$; $r = 25\%$.
Difficulty: 1 Easy
Topic: Net Present Value
Learning Objective: 02-01 Future Values and Present Values
Bloom's: Understand
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13) If the one-year discount factor is 0.90, what is the present value of $120 expected one year from today?
A) $100
B) $96
C) $108
D) $133

Answer: C
Explanation: PV = (120)(0.90) = 108.
Difficulty: 1 Easy
Topic: Net Present Value
Learning Objective: 02-01 Future Values and Present Values
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14) If the present value of $600, expected one year from today, is $400, what is the one-year discount rate?
A) 15 percent
B) 20 percent
C) 25 percent
D) 50 percent

Answer: D
Explanation: $1 + r = (600)/(400) = 1.5$; $r = 50\%$.
Difficulty: 1 Easy
Topic: Net Present Value
Learning Objective: 02-01 Future Values and Present Values
Bloom's: Understand
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15) The present value formula for a cash flow expected one period from now is:
A) PV = $C_1 \times (1 + r)$.
B) PV = $C_1/(1 + \text{r})$.
C) PV = C_1/r.
D) PV = $(1 + r)/C_1$.

Answer: B
Difficulty: 1 Easy
Topic: Net Present Value
Learning Objective: 02-01 Future Values and Present Values
Bloom's: Remember
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16) The net present value formula for one period is:
A) NPV = $C_0 + [C_1/(1 + r)]$.
B) NPV = PV required investment.
C) NPV = C_0/C_1.
D) NPV = C_1/C_0.

Answer: A
Difficulty: 1 Easy
Topic: Net Present Value
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17) An initial investment of $400,000 is expected to produce an end-of-year cash flow of $480,000. What is the NPV of the project at a discount rate of 20 percent?
A) $176,000
B) $80,000
C) $0 (zero)
D) $64,000

Answer: C
Explanation: NPV = -400,000 + (480,000/1.2) = 0.
Difficulty: 1 Easy
Topic: Net Present Value
Learning Objective: 02-01 Future Values and Present Values
Bloom's: Understand
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18) If the present value of a cash flow generated by an initial investment of $200,000 is $250,000, what is the NPV of the project?
A) $250,000
B) $50,000
C) $200,000
D) -$50,000

Answer: B
Explanation: NPV = -200,000 + 250,000 = 50,000.
Difficulty: 1 Easy
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19) What is the present value of the following cash flows at a discount rate of 9 percent?

Year 1	Year 2	Year 3
$100,000	$150,000	$200,000

A) $372,431.81
B) $450,000.00
C) $405,950.68
D) $412,844.04

Answer: A
Explanation: PV = (100,000/1.09) + (150,000/(1.09^2)) + 200,000/(1.09^3) = 372,431.81.
Difficulty: 2 Medium
Topic: Net Present Value
Learning Objective: 02-01 Future Values and Present Values
Bloom's: Understand
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20) At an interest rate of 10 percent, which of the following sequences of cash flows should you prefer?

	Year 1	Year 2	Year 3
A	500	300	100
B	100	300	500
C	300	300	300
D	Any of the above as they all add up to $900		

A) Option A
B) Option B
C) Option C
D) Option D

Answer: A
Explanation: PV(A) = 777.61; PV(B) = 714.50; PV(C) = 746.05; A is preferred.
Difficulty: 2 Medium
Topic: Net Present Value
Learning Objective: 02-01 Future Values and Present Values
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21) What is the net present value of the following cash flow sequence at a discount rate of 11 percent?

t = 0	t = 1	t = 2
-120,000	300,000	-100,000

A) $69,108.03
B) $231,432.51
C) $80,000.00
D) $88,000.00

Answer: A
Explanation: NPV = -120,000 + (300,000/1.11) -(100,000/(1.11^2)) = 69,108.03.
Difficulty: 2 Medium
Topic: Net Present Value
Learning Objective: 02-01 Future Values and Present Values
Bloom's: Understand
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22) What is the net present value of the following sequence of annual cash flows at a discount rate of 16 percent APR?

t = 1	t = 2
-100,000	300,000

A) $136,741.97
B) $122,948.87
C) $158,620.69
D) $139,418.23

Answer: A
Explanation: PV = (-100,000/1.16) + (300,000/(1.16^2)) = 136,741.97.
Difficulty: 2 Medium
Topic: Net Present Value
Learning Objective: 02-01 Future Values and Present Values
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23) What is the net present value (NPV) of the following sequence of cash flows at a discount rate of 9 percent?

t = 0	t = 1	t = 2	t = 3
-250,000	100,000	150,000	200,000

A) $122,431.81
B) $200,000.00
C) $155,950.68
D) $177,483.77

Answer: A
Explanation: NPV = -250,000 + (100,000/1.09) + (150,000/(1.09^2)) + (200,000/(1.09^3)).

NPV = 122,431.81.
Difficulty: 2 Medium
Topic: Net Present Value
Learning Objective: 02-01 Future Values and Present Values
Bloom's: Understand
AACSB: Analytical Thinking
Accessibility: Keyboard Navigation

24) Which of the following statements regarding the NPV rule and the rate of return rule is false?
A) Accept a project if its NPV > 0.
B) Reject a project if the NPV < 0.
C) Accept a project if its rate of return > 0.
D) Accept a project if its rate of return > opportunity cost of capital.

Answer: C
Difficulty: 1 Easy
Topic: Net Present Value
Learning Objective: 02-01 Future Values and Present Values
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25) An initial investment of $500 produces a cash flow of $550 one year from today. Calculate the rate of return on the project.
A) 10 percent
B) 15 percent
C) 20 percent
D) 25 percent

Answer: A
Explanation: Rate of return = (550 - 500)/500 = 10%.
Difficulty: 1 Easy
Topic: Net Present Value
Learning Objective: 02-01 Future Values and Present Values
Bloom's: Understand
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26) According to the net present value rule, an investment in a project should be made if the:
A) net present value is greater than the cost of investment.
B) net present value is greater than the present value of cash flows.
C) net present value is positive.
D) net present value is negative.

Answer: C
Difficulty: 1 Easy
Topic: Net Present Value
Learning Objective: 02-01 Future Values and Present Values
Bloom's: Remember
AACSB: Analytical Thinking
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27) Which of the following statements regarding the net present value rule and the rate of return rule is false?
A) Accept a project if NPV > cost of investment.
B) Accept a project if NPV is positive.
C) Accept a project if return on investment exceeds the rate of return on an equivalent-risk investment in the financial market.
D) Reject a project if NPV is negative.

Answer: A
Difficulty: 1 Easy
Topic: Net Present Value
Learning Objective: 02-01 Future Values and Present Values
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28) The opportunity cost of capital for a risky project is:
A) the expected rate of return on a government security having the same maturity as the project.
B) the expected rate of return on a well-diversified portfolio of common stocks.
C) the expected rate of return on a security of similar risk as the project.
D) the expected rate of return on a typical bond portfolio.

Answer: C
Difficulty: 2 Medium
Topic: Net Present Value
Learning Objective: 02-01 Future Values and Present Values
Bloom's: Understand
AACSB: Analytical Thinking
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29) A perpetuity is defined as a sequence of:
A) equal cash flows occurring at equal intervals of time for a specific number of periods.
B) equal cash flows occurring at equal intervals of time forever.
C) unequal cash flows occurring at equal intervals of time forever.
D) unequal cash flows occurring at equal intervals of time for a specific number of periods.

Answer: B
Difficulty: 1 Easy
Topic: Perpetuities
Learning Objective: 02-02 Looking for Shortcuts - Perpetuities and Annuities
Bloom's: Remember
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30) Which of the following is generally considered an example of a perpetuity?
A) Interest payments on a 10-year bond
B) Interest payments on a 30-year bond
C) Interest payments on a consol
D) Interest payments on government bonds

Answer: C
Difficulty: 1 Easy
Topic: Perpetuities
Learning Objective: 02-02 Looking for Shortcuts - Perpetuities and Annuities
Bloom's: Remember
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31) You would like to have enough money saved after your retirement such that you and your heirs can receive $100,000 per year in perpetuity. How much would you need to have saved at the time of your retirement in order to achieve this goal? (Assume that the perpetuity payments start one year after the date of your retirement. The annual interest rate is 12.5 percent.)
A) $1,000,000
B) $10,000,000
C) $800,000
D) $1,125,000

Answer: C
Explanation: PV = (100,000/0.125) = 800,000.
Difficulty: 2 Medium
Topic: Perpetuities
Learning Objective: 02-02 Looking for Shortcuts - Perpetuities and Annuities
Bloom's: Apply
AACSB: Analytical Thinking
Accessibility: Keyboard Navigation

32) What is the present value of $10,000 per year in perpetuity at an annual interest rate of 10 percent? Assume the perpetuity starts in one year.
A) $10,000
B) $100,000
C) $200,000
D) $1,000

Answer: B
Explanation: PV = (10,000/0.10) = 100,000.
Difficulty: 1 Easy
Topic: Perpetuities
Learning Objective: 02-02 Looking for Shortcuts - Perpetuities and Annuities
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33) You would like to have enough money saved to receive $80,000 per year in perpetuity after retirement for you and your heirs. How much would you need to have saved in your retirement fund to achieve this goal? (Assume that the perpetuity payments start one year from the date of your retirement. The annual interest rate is 8 percent.)
A) $7,500,000
B) $750,000
C) $1,000,000
D) $800,000

Answer: C
Explanation: PV = (80,000/0.08) = 1,000,000.
Difficulty: 1 Easy
Topic: Perpetuities
Learning Objective: 02-02 Looking for Shortcuts - Perpetuities and Annuities
Bloom's: Understand
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34) You would like to have enough money saved to receive a $50,000 per year perpetuity after retirement. How much would you need to have saved in your retirement fund to achieve this goal? (Assume that the perpetuity payments start on the day of your retirement. The annual interest rate is 8 percent.)
A) $1,000,000
B) $675,000
C) $625,000
D) $500,000

Answer: B
Explanation: PV = [50,000/0.08)] × (1.08) = 675,000; or PV = 50,000 + (50,000/0.08).
Difficulty: 2 Medium
Topic: Perpetuities
Learning Objective: 02-02 Looking for Shortcuts - Perpetuities and Annuities
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35) You would like to have enough money saved to receive an $80,000 per year perpetuity after retirement. How much would you need to have saved in your retirement fund to achieve this goal? (Assume that the perpetuity payments start on the day of your retirement. The annual interest rate is 10 percent.)
A) $1,500,000
B) $880,000
C) $800,000
D) $80,000

Answer: B
Explanation: PV = [(80,000/0.10)] × (1.1) = 880,000; or PV = 80,000 + 80,000/0.10.
Difficulty: 2 Medium
Topic: Perpetuities
Learning Objective: 02-02 Looking for Shortcuts - Perpetuities and Annuities
Bloom's: Understand
AACSB: Analytical Thinking
Accessibility: Keyboard Navigation

36) An annuity is defined as a set of:
A) equal cash flows occurring at equal intervals of time for a specified period.
B) equal cash flows occurring at equal intervals of time forever.
C) unequal cash flows occurring at equal intervals of time forever.
D) unequal cash flows occurring at equal intervals of time for a specified period.

Answer: A
Difficulty: 1 Easy
Topic: Present Value - Annuity
Learning Objective: 02-02 Looking for Shortcuts - Perpetuities and Annuities
Bloom's: Remember
AACSB: Analytical Thinking
Accessibility: Keyboard Navigation

37) If you are paid $1,000 at the end of each year for the next five years, what type of cash flow did you receive?
A) Uneven cash flow stream
B) An annuity
C) An annuity due
D) A perpetuity

Answer: B
Difficulty: 1 Easy
Topic: Present Value - Annuity
Learning Objective: 02-02 Looking for Shortcuts - Perpetuities and Annuities
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38) If the three-year present value annuity factor is 2.673 and the two-year present value annuity factor is 1.833, what is the present value of $1 received at the end of the three years?
A) $1.19
B) $0.84
C) $0.89
D) $0.92

Answer: B
Explanation: PV = (2.673 - 1.833) × (1) = 0.84.
Difficulty: 2 Medium
Topic: Present Value - Annuity
Learning Objective: 02-02 Looking for Shortcuts - Perpetuities and Annuities
Bloom's: Understand
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39) If the five-year present value annuity factor is 3.60478 and the four-year present value annuity factor is 3.03735, what is the present value of the $1 received at the end of five years?
A) $0.63552
B) $1.76233
C) $0.56743
D) $1.2132

Answer: C
Explanation: PV = (3.60478 - 3.03735) × (1) = 0.56743.
Difficulty: 2 Medium
Topic: Present Value - Annuity
Learning Objective: 02-02 Looking for Shortcuts - Perpetuities and Annuities
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40) What is the eight-year present value annuity factor at a discount rate of 11 percent?
A) 5.7122
B) 11.8594
C) 5.1461
D) 6.9158

Answer: C
Explanation: PV annuity factor = (1/0.11) - (1/((0.11)(1.11^8))) = 5.1461.
Difficulty: 2 Medium
Topic: Present Value - Annuity
Learning Objective: 02-02 Looking for Shortcuts - Perpetuities and Annuities
Bloom's: Understand
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41) What is the six-year present value annuity factor at an interest rate of 9 percent?
A) 7.5233
B) 4.4859
C) 1.6771
D) 3.1432

Answer: B
Explanation: PV annuity factor = (1/0.09) - (1/((0.09)(1.09^6))) = 4.4859.
Difficulty: 2 Medium
Topic: Present Value - Annuity
Learning Objective: 02-02 Looking for Shortcuts - Perpetuities and Annuities
Bloom's: Understand
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42) What is the present value of a $1,000 per year annuity for five years at an interest rate of 12 percent?
A) $6,352.85
B) $3,604.78
C) $567.43
D) $2,743.28

Answer: B
Explanation: PV annuity factor = [(1/0.12) - (1/((0.12)(1.12^ 5)))] × 1,000 = 3,604.78.
Difficulty: 2 Medium
Topic: Present Value - Annuity
Learning Objective: 02-02 Looking for Shortcuts - Perpetuities and Annuities
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43) What is the present value of a six-year, $5,000 per year annuity at a discount rate of 10 percent?
A) $21,776.30
B) $3,371.91
C) $16,760.78
D) $18,327.82

Answer: A
Explanation: PV = [(1/0.10) - (1/((0.10)(1.10^6)))] × 5,000 = 21,776.30.
Difficulty: 2 Medium
Topic: Present Value - Annuity
Learning Objective: 02-02 Looking for Shortcuts - Perpetuities and Annuities
Bloom's: Understand
AACSB: Analytical Thinking
Accessibility: Keyboard Navigation

44) After retirement, you expect to live for 25 years. You would like to have $75,000 income each year. How much should you have saved in your retirement account to receive this income, if the annual interest rate is 9 percent per year? (Assume that the payments start on the day of your retirement.)
A) $736,693.47
B) $802,995.88
C) $2,043,750.21
D) $1,427,831.93

Answer: B
Explanation: PV = [[(1/0.09) - (1/((0.09)(1.09^25)))] × 75,000] × (1.09) = 802,995.88.
Alternatively, [(75,000/.09) × [1 - (1/(1.09^25)]] × (1.09) = 802,995.88.
Difficulty: 3 Hard
Topic: Future Value - Annuity
Learning Objective: 02-02 Looking for Shortcuts - Perpetuities and Annuities
Bloom's: Apply
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45) After retirement, you expect to live for 25 years. You would like to have $75,000 income each year. How much should you have saved in your retirement account to receive this income if the annual interest rate is 9 percent per year? (Assume that the payments start one year after your retirement.)
A) $736,693.47
B) $83,431.17
C) $1,875,000
D) $1,213,487.12

Answer: A
Explanation: PV = [(1/0.09) - (1/((0.09)(1.09^25)))] × 75,000 = 736,693.47. Alternatively, [(75,000/.09) × [1 - (1/(1.09^25)]] = 736,693.47.
Difficulty: 3 Hard
Topic: Future Value - Annuity
Learning Objective: 02-02 Looking for Shortcuts - Perpetuities and Annuities
Bloom's: Apply
AACSB: Analytical Thinking
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46) For $10,000, you can purchase a five-year annuity that will pay $2,504.57 per year for five years. The payments occur at the end of each year. Calculate the effective annual interest rate implied by this arrangement.
A) 8 percent
B) 9 percent
C) 10 percent
D) 11 percent

Answer: A
Explanation: Using a financial calculator: N = 5; PV = -10,000; PMT = 2504.57; FV = 0.

Compute: I = 8.0% [calculator setting: END].
Difficulty: 2 Medium
Topic: Present Value - Annuity
Learning Objective: 02-02 Looking for Shortcuts - Perpetuities and Annuities
Bloom's: Understand
AACSB: Analytical Thinking
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Principles of Corporate Finance 13th edition Brealey Test Bank

47) If the present value annuity factor for 10 years at 10 percent interest rate is 6.1446, what is the present value annuity factor for an equivalent annuity due?
A) 6.1446
B) 7.3800
C) 6.7590
D) 5.7321

Answer: C
Explanation: Annuity due: 6.1446 × 1.1 = 6.7590.
Difficulty: 2 Medium
Topic: Present Value - Annuity
Learning Objective: 02-02 Looking for Shortcuts - Perpetuities and Annuities
Bloom's: Understand
AACSB: Analytical Thinking
Accessibility: Keyboard Navigation

48) If the present value annuity factor is 3.8896, what is the present value annuity factor for an equivalent annuity due if the interest rate is 9 percent?
A) 3.5684
B) 4.2397
C) 3.8896
D) 5.3127

Answer: B
Explanation: Annuity due factor = 3.8896 × 1.09 = 4.2397.
Difficulty: 2 Medium
Topic: Present Value - Annuity
Learning Objective: 02-02 Looking for Shortcuts - Perpetuities and Annuities
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49) For $10,000, you can purchase a five-year annuity that will pay $2,358.65 per year for five years. The payments occur at the beginning of each year. Calculate the effective annual interest rate implied by this arrangement.
A) 8 percent
B) 9 percent
C) 10 percent
D) 11 percent

Answer: B
Explanation: Using a financial calculator: N = 5; PV = -10,000; PMT = 2358.65; FV = 0.

Compute: I = 9.0% [Calculator setting: BEGIN (BGN)].
Difficulty: 2 Medium
Topic: Present Value - Annuity
Learning Objective: 02-02 Looking for Shortcuts - Perpetuities and Annuities
Bloom's: Understand
AACSB: Analytical Thinking
Accessibility: Keyboard Navigation

50) John House has taken a $250,000 mortgage on his house at an interest rate of 6 percent per year. If the mortgage calls for 20 equal, annual payments, what is the amount of each payment?
A) $21,796.14
B) $10,500.00
C) $16,882.43
D) $24,327.18

Answer: A
Explanation: Use a financial calculator: PV = 250,000; I = 6%; N = 20; FV = 0.

Compute PMT = -$21,796.14.
Difficulty: 2 Medium
Topic: Present Value - Annuity
Learning Objective: 02-02 Looking for Shortcuts - Perpetuities and Annuities
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51) John House has taken a 20-year, $250,000 mortgage on his house at an interest rate of 6 percent per year. What is the remaining balance (or value) of the mortgage after the payment of the fifth annual installment?
A) $128,958.41
B) $211,689.53
C) $141,019.50
D) $248,719.21

Answer: B
Explanation: Step 1: I = 6%; N = 20; PV = 250,000; FV = 0. Compute PMT = 21,796.14.

Step 2: I = 6%; N = 15; PMT = 21,796.14. Compute PV = 211,689.53.
Difficulty: 3 Hard
Topic: Present Value - Annuity
Learning Objective: 02-02 Looking for Shortcuts - Perpetuities and Annuities
Bloom's: Apply
AACSB: Analytical Thinking
Accessibility: Keyboard Navigation

52) If the present value of $1 received *n* years from today at an interest rate of *r* is 0.3855, then what is the future value of $1 invested today at an interest rate of *r* percent for *n* years?
A) $1.3855
B) $2.594
C) $1.701
D) Not enough information is given to solve the problem.

Answer: B
Explanation: FV = 1/(0.3855) = 2.594.
Difficulty: 2 Medium
Topic: Future Value - Annuity
Learning Objective: 02-02 Looking for Shortcuts - Perpetuities and Annuities
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53) If the present value of $1 received *n* years from today at an interest rate of *r* is 0.621, then what is the future value of $1 invested today at an interest rate of *r*% for *n* years?
A) $1.000
B) $1.610
C) $1.621
D) Not enough information is given to solve the problem.

Answer: B
Explanation: FV = 1/(0.621) = 1.61.
Difficulty: 2 Medium
Topic: Future Value - Annuity
Learning Objective: 02-02 Looking for Shortcuts - Perpetuities and Annuities
Bloom's: Understand
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54) If the future value of $1 invested today at an interest rate of *r* percent for *n* years is 9.6463, what is the present value of $1 to be received in *n* years at *r* percent interest rate?
A) $9.6463
B) $1.0000
C) $0.1037
D) $0.4132

Answer: C
Explanation: PV = 1/9.6463 = 0.1037.
Difficulty: 2 Medium
Topic: Future Value - Annuity
Learning Objective: 02-02 Looking for Shortcuts - Perpetuities and Annuities
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55) If the future value annuity factor at 10 percent and five years is 6.1051, calculate the equivalent present value annuity factor:
A) 6.1051
B) 3.7908
C) 6.7156
D) 4.8127

Answer: B
Explanation: PV = 6.1051/(1.1)^5 = 3.7908.
Difficulty: 2 Medium
Topic: Future Value - Annuity
Learning Objective: 02-02 Looking for Shortcuts - Perpetuities and Annuities
Bloom's: Understand
AACSB: Analytical Thinking
Accessibility: Keyboard Navigation

56) If the present value annuity factor at 10 percent for 10 years is 6.1446, what is the equivalent future value annuity factor?
A) 3.1080
B) 15.9375
C) 2.5937
D) 8.4132

Answer: B
Explanation: FV annuity factor = 6.1446 × (1.1^10) = 15.9375.
Difficulty: 2 Medium
Topic: Present Value - Annuity
Learning Objective: 02-02 Looking for Shortcuts - Perpetuities and Annuities
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57) If the present value annuity factor at 12 percent for five years is 3.6048, what is the equivalent future value annuity factor?
A) 2.0455
B) 6.3529
C) 1.7623
D) 5.1237

Answer: B
Explanation: FV annuity factor = 3.6048 × (1.12^5) = 6.3529.
Difficulty: 2 Medium
Topic: Present Value - Annuity
Learning Objective: 02-02 Looking for Shortcuts - Perpetuities and Annuities
Bloom's: Understand
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58) If the present value annuity factor at 8 percent for 10 years is 6.71, what is the equivalent future value annuity factor?
A) 3.108
B) 14.486
C) 2.159
D) 5.384

Answer: B
Explanation: FV annuity factor = 6.71 × (1.08^10) = 14.486.
Difficulty: 2 Medium
Topic: Present Value - Annuity
Learning Objective: 02-02 Looking for Shortcuts - Perpetuities and Annuities
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59) You are considering investing in a retirement fund that requires you to deposit $5,000 per year, and you want to know how much the fund will be worth when you retire. What financial technique should you use to calculate this value?
A) Future value of a single payment
B) Future value of an annuity
C) Present value of an annuity
D) Present value of a perpetuity

Answer: B
Difficulty: 2 Medium
Topic: Future Value - Annuity
Learning Objective: 02-02 Looking for Shortcuts - Perpetuities and Annuities
Bloom's: Understand
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60) Mr. Hopper expects to retire in 25 years, and he wishes to accumulate $750,000 in his retirement fund by that time. If the interest rate is 10 percent per year, how much should Mr. Hopper put into his retirement fund each year in order to achieve this goal? (Assume that he makes payments at the end of each year.)
A) $4,559.44
B) $2,500
C) $7,626.05
D) $8,418.29

Answer: C
Explanation: Future value annuity factor = [(1.1^25) - 1]/(0.1) = 98.347;

payment = 750,000/98.347 = 7626.05.
Difficulty: 3 Hard
Topic: Future Value - Annuity
Learning Objective: 02-02 Looking for Shortcuts - Perpetuities and Annuities
Bloom's: Apply
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61) Mr. Hopper expects to retire in 30 years, and he wishes to accumulate $1,000,000 in his retirement fund by that time. If the interest rate is 12 percent per year, how much should Mr. Hopper put into his retirement fund at the end of each year in order to achieve this goal?
A) $4,143.66
B) $8,287.32
C) $4,000.00
D) $12,483.17

Answer: A
Explanation: Future value annuity factor = [(1.12^30 - 1]/(0.12) = 241.3327; payment = 1,000,000/241.3327 = 4143.66.
Difficulty: 3 Hard
Topic: Future Value - Annuity
Learning Objective: 02-02 Looking for Shortcuts - Perpetuities and Annuities
Bloom's: Apply
AACSB: Analytical Thinking
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62) You would like to have enough money saved to receive a growing annuity for 20 years, growing at a rate of 5 percent per year, with the first payment of $50,000 occurring exactly one year after retirement. How much would you need to save in your retirement fund to achieve this goal? The interest rate is 10 percent.
A) $1,000,000.00
B) $425,678.19
C) $605,604.20
D) $827,431.28

Answer: C
Explanation: PV = (50,000) [(1/(0.1 - 0.05)) - {(1/(0.1 - 0.05)}{(1.05^20)/(1.10^20)}] = 605,604.20.
Difficulty: 3 Hard
Topic: Future Value - Annuity
Learning Objective: 02-02 Looking for Shortcuts - Perpetuities and Annuities
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63) You would like to have enough money saved to receive a growing annuity for 25 years, growing at a rate of 4 percent per year, with the first payment of $60,000 occurring exactly one year after retirement. How much would you need to save in your retirement fund to achieve this goal? The interest rate is 12 percent.
A) $1,500,000.00
B) $632,390
C) $452,165
D) $1,043,287

Answer: B
Explanation: PV = (60,000) [(1/(0.12 - 0.04)) - {(1/(0.12 - 0.04)}{(1.04^25)/(1.12^25)}] = 632,390.
Difficulty: 3 Hard
Topic: Future Value - Annuity
Learning Objective: 02-02 Looking for Shortcuts - Perpetuities and Annuities
Bloom's: Apply
AACSB: Analytical Thinking
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64) The managers of a firm can maximize stockholder wealth by:
A) taking all projects with positive NPVs.
B) taking all projects with NPVs greater than the cost of investment.
C) taking all projects with NPVs greater than the present value of cash flows.
D) taking only the highest NPV project each year.

Answer: A
Difficulty: 1 Easy
Topic: Net Present Value
Learning Objective: 02-01 Future Values and Present Values
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65) If you invest $100 at 12 percent for three years, how much would you have at the end of three years using compound interest?
A) $136
B) $140.49
C) $240.18
D) $173.18

Answer: B
Explanation: FV = 100 × (1.12^3) = $140.49.
Difficulty: 1 Easy
Topic: Future Value - Single Cash Flow
Learning Objective: 02-01 Future Values and Present Values
Bloom's: Understand
AACSB: Analytical Thinking
Accessibility: Keyboard Navigation

66) Which of the following statements is true?
A) The process of discounting is the inverse of the process of compounding.
B) Ending balances using simple interest are always greater than ending balances using compound interest at positive interest rates.
C) The present value of an annuity due is always less than the present value of an equivalent ordinary annuity at positive interest rates.
D) The future value of an annuity due is always less than the present value of an equivalent ordinary annuity at positive interest rates.

Answer: A
Difficulty: 2 Medium
Topic: Net Present Value
Learning Objective: 02-01 Future Values and Present Values
Bloom's: Understand
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67) The concept of compound interest is best described as:
A) interest earned on an investment.
B) the total amount of interest earned over the life of an investment.
C) interest earned on interest.
D) the inverse of simple interest.

Answer: C
Difficulty: 2 Medium
Topic: Net Present Value
Learning Objective: 02-01 Future Values and Present Values
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68) Ms. Colonial has just taken out a $150,000 mortgage at an interest rate of 6 percent per year. If the mortgage calls for equal monthly payments for 20 years, what is the amount of each payment? (Assume monthly compounding or discounting.)
A) $1,254.70
B) $1,625.00
C) $1,263.06
D) $1,074.65

Answer: D
Explanation: PMT = 150,000/[(1/0.005) - 1/((0.005 × ((1 + 0.005)^240)))] = $1,074.65.
Difficulty: 3 Hard
Topic: Present Value - Annuity
Learning Objective: 02-02 Looking for Shortcuts - Perpetuities and Annuities
Bloom's: Apply
AACSB: Analytical Thinking
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69) An investment having a 10.47 percent effective annual rate (EAR) has what APR? (Assume monthly compounding.)
A) 10.99 percent
B) 9.57 percent
C) 10.00 percent
D) 8.87 percent

Answer: C
Explanation: NOM = [(1.1047)^(1/12) - 1] × 12 = 0.1 = 10.00%.
Difficulty: 2 Medium
Topic: Net Present Value
Learning Objective: 02-01 Future Values and Present Values
Bloom's: Understand
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70) An investment at 12 percent APR compounded monthly is equal to an effective annual rate of:
A) 12.68 percent.
B) 12.36 percent.
C) 12.00 percent.
D) 11.87 percent.

Answer: A
Explanation: EAR = ((1 + 0.12/12)^12) - 1 = 0.12681 = 12.68%.
Difficulty: 2 Medium
Topic: Net Present Value
Learning Objective: 02-01 Future Values and Present Values
Bloom's: Understand
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71) Mr. Williams expects to retire in 30 years and would like to accumulate $1 million in his pension fund. If the annual interest rate is 12 percent, how much should Mr. Williams put into his pension fund each month in order to achieve his goal? (Assume that Mr. Williams will deposit the same amount each month into his pension fund, using monthly compounding.)
A) $286.13
B) $771.60
C) $345.30
D) $437.13

Answer: A
Explanation: PMT = 1,000,000/{[(1/0.01) - (1/(0.01 × (1.01^360)))] × (1.01^360)} = $286.13.
Difficulty: 2 Medium
Topic: Future Value - Annuity
Learning Objective: 02-02 Looking for Shortcuts - Perpetuities and Annuities
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72) An investment at 10 percent compounded continuously has an equivalent annual rate of:
A) 10.250 percent.
B) 10.517 percent.
C) 10.381 percent.
D) none of the options.

Answer: B
Explanation: (e^(0.1)) - 1 = 0.10517 = 10.517 percent.
Difficulty: 2 Medium
Topic: Net Present Value
Learning Objective: 02-01 Future Values and Present Values
Bloom's: Understand
AACSB: Analytical Thinking
Accessibility: Keyboard Navigation

73) The present value of a $100 per year perpetuity at 10 percent per year interest rate is $1,000. What would be the present value of this perpetuity if the payments were compounded continuously?
A) $1,000.00
B) $1,049.21
C) $1,024.40
D) $986.14

Answer: B
Explanation: (e^r) = 1.1; r = ln(1.1) = 0.09531; PV = 100/0.09531 = $1,049.21.
Difficulty: 2 Medium
Topic: Perpetuities
Learning Objective: 02-02 Looking for Shortcuts - Perpetuities and Annuities
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74) You just inherited a trust that will pay you $100,000 per year in perpetuity. However, the first payment will not occur for exactly four more years. Assuming an 8 percent annual interest rate, what is the value of this trust?
A) $918,787
B) $992,290
C) $1,000,000
D) $1,250,000

Answer: B
Explanation: PV (@ $t = 3$) = 100,000/0.08 = $1,250,000; PV (@ $t = 0$) = 1,250,000/(1.08)^3 = $992,290.
Difficulty: 3 Hard
Topic: Perpetuities
Learning Objective: 02-02 Looking for Shortcuts - Perpetuities and Annuities
Bloom's: Understand
AACSB: Analytical Thinking
Accessibility: Keyboard Navigation

75) You just inherited a trust that will pay you $100,000 per year in perpetuity. However, the first payment will not occur for exactly four more years. Assuming a 10 percent annual interest rate, what is the value of this trust?
A) $683,013
B) $751,315
C) $1,000,000
D) $1,100,000

Answer: B
Explanation: PV (@ $t = 3$) = 100,000/0.10 = $1,000,000; PV (@ $t = 0$) = 1,000,000/(1.10)^3 = $751,315.
Difficulty: 3 Hard
Topic: Perpetuities
Learning Objective: 02-02 Looking for Shortcuts - Perpetuities and Annuities
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76) You just inherited a trust that will pay you $100,000 per year in perpetuity. However, the first payment will not occur for exactly five more years. Assuming an 8 percent annual interest rate, what is the value of this trust?
A) $850,729
B) $918,787
C) $1,000,000
D) $1,250,000

Answer: B
Explanation: PV (@ $t = 4$) = 100,000/0.08 = $1,250,000; PV (@ $t = 0$) = 1,250,000/(1.08)^4 = $918,787.
Difficulty: 3 Hard
Topic: Perpetuities
Learning Objective: 02-02 Looking for Shortcuts - Perpetuities and Annuities
Bloom's: Understand
AACSB: Analytical Thinking
Accessibility: Keyboard Navigation

77) You just inherited a trust that will pay you $100,000 per year in perpetuity. However, the first payment will not occur for exactly five more years. Assuming a 10 percent annual interest rate, what is the value of this trust?
A) $620,921
B) $683,013
C) $1,000,000
D) $1,100,000

Answer: B
Explanation: PV (@ $t = 4$) = 100,000/0.10 = $1,000,000; PV (@ $t = 0$) = 1,000,000/(1.10)^4 = $683,013.
Difficulty: 3 Hard
Topic: Perpetuities
Learning Objective: 02-02 Looking for Shortcuts - Perpetuities and Annuities
Bloom's: Understand
AACSB: Analytical Thinking
Accessibility: Keyboard Navigation

78) The rate of return, discount rate, hurdle rate, and opportunity cost of capital all have the same meaning.

Answer: TRUE
Difficulty: 1 Easy
Topic: Net Present Value
Learning Objective: 02-01 Future Values and Present Values
Bloom's: Understand
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79) A dollar today is worth more than a dollar tomorrow if the interest rate is positive.

Answer: TRUE
Difficulty: 1 Easy
Topic: Net Present Value
Learning Objective: 02-01 Future Values and Present Values
Bloom's: Understand
AACSB: Analytical Thinking
Accessibility: Keyboard Navigation

80) One can find the present value of a future cash flow by dividing it by an appropriate discount factor.

Answer: FALSE
Difficulty: 1 Easy
Topic: Net Present Value
Learning Objective: 02-01 Future Values and Present Values
Bloom's: Understand
AACSB: Analytical Thinking
Accessibility: Keyboard Navigation

81) One can find a project's net present value by subtracting the present value of its required investment from the present value of its future cash flows.

Answer: TRUE
Difficulty: 1 Easy
Topic: Net Present Value
Learning Objective: 02-01 Future Values and Present Values
Bloom's: Understand
AACSB: Analytical Thinking
Accessibility: Keyboard Navigation

82) The opportunity cost of capital is higher for safe investments than for risky ones.

Answer: FALSE
Difficulty: 1 Easy
Topic: Net Present Value
Learning Objective: 02-01 Future Values and Present Values
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83) A safe dollar is always worth less than a risky dollar because the rate of return on a safe investment is generally low and the rate of return on a risky investment is generally high.

Answer: FALSE
Difficulty: 1 Easy
Topic: Net Present Value
Learning Objective: 02-01 Future Values and Present Values
Bloom's: Understand
AACSB: Analytical Thinking
Accessibility: Keyboard Navigation

84) "Accept investments that have positive net present values" is called the net present value rule.

Answer: TRUE
Difficulty: 1 Easy
Topic: Net Present Value
Learning Objective: 02-01 Future Values and Present Values
Bloom's: Understand
AACSB: Analytical Thinking
Accessibility: Keyboard Navigation

85) Generally, one should accept investments that offer rates of return in excess of their opportunity costs of capital.

Answer: TRUE
Difficulty: 1 Easy
Topic: Net Present Value
Learning Objective: 02-01 Future Values and Present Values
Bloom's: Understand
AACSB: Analytical Thinking
Accessibility: Keyboard Navigation

86) The rate of return on any perpetuity is equal to its cash flow multiplied by its price.

Answer: FALSE
Difficulty: 1 Easy
Topic: Perpetuities
Learning Objective: 02-02 Looking for Shortcuts - Perpetuities and Annuities
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87) An annuity is an asset that pays a fixed amount each period for a specified number of periods.

Answer: TRUE
Difficulty: 1 Easy
Topic: Present Value - Annuity
Learning Objective: 02-02 Looking for Shortcuts - Perpetuities and Annuities
Bloom's: Understand
AACSB: Analytical Thinking
Accessibility: Keyboard Navigation

88) The value of a five-year annuity is equal to the sum of two perpetuities. One makes its first payment in year 1, and the other makes its first payment in year 6.

Answer: FALSE
Difficulty: 1 Easy
Topic: Present Value - Annuity
Learning Objective: 02-02 Looking for Shortcuts - Perpetuities and Annuities
Bloom's: Understand
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89) An equal-payment home mortgage is an example of an annuity.

Answer: TRUE
Difficulty: 1 Easy
Topic: Present Value - Annuity
Learning Objective: 02-02 Looking for Shortcuts - Perpetuities and Annuities
Bloom's: Understand
AACSB: Analytical Thinking
Accessibility: Keyboard Navigation

90) In the amortization of a mortgage loan with equal payments, the fraction of each payment devoted to interest steadily increases over time and the fraction devoted to reducing the loan balance decreases steadily.

Answer: FALSE
Difficulty: 1 Easy
Topic: Present Value - Annuity
Learning Objective: 02-02 Looking for Shortcuts - Perpetuities and Annuities
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91) The present value of a growing perpetuity, with cash flow C_1 occurring one year from now, is given by: $[C_1/(r - g)]$, where $r > g$.

Answer: TRUE
Difficulty: 2 Medium
Topic: Perpetuities
Learning Objective: 02-03 More Shortcuts - Growing perpetuities and Annuities
Bloom's: Remember
AACSB: Analytical Thinking
Accessibility: Keyboard Navigation

92) Briefly explain the term *discount rate.*

Answer: The discount rate is the rate of return used for discounting future cash flows to obtain present values. The discount rate can be obtained by looking at the rate of return on an equivalent-risk investment opportunity in the financial market.
Difficulty: 3 Hard
Topic: Rate of Return
Learning Objective: 02-01 Future Values and Present Values
Bloom's: Understand
AACSB: Analytical Thinking
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93) Intuitively explain the concept of present value.

Answer: If you have $100 today, you can invest it and start earning interest on it. On the other hand, if you have to make a payment of $100 one year from today, you do not need to invest $100 today, but a lesser amount. The lesser amount invested today plus the interest earned on it should add up to $100. The present value of $100 one year from today at an interest rate of 10 percent is $90.91. [PV = 100/1.1 = 90.91.]
Difficulty: 3 Hard
Topic: Net Present Value
Learning Objective: 02-01 Future Values and Present Values
Bloom's: Understand
AACSB: Analytical Thinking
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94) State the net present value rule.

Answer: Invest in projects with positive net present values. Net present value is the difference between the present value of future cash flows from the project and the present value of the initial investment.
Difficulty: 2 Medium
Topic: Net Present Value
Learning Objective: 02-01 Future Values and Present Values
Bloom's: Understand
AACSB: Analytical Thinking
Accessibility: Keyboard Navigation

95) Briefly explain the concept of risk.

Answer: If the future cash flows from an investment are not certain, then we call such an investment risky. That means there is an uncertainty about the future cash flows or future cash flows could be different from expected cash flows. The degree of uncertainty varies from investment to investment. Uncertain cash flows are discounted using a higher discount rate than certain cash flows. This is only one method of dealing with risk. There are many ways to consider risk while making financial decisions.
Difficulty: 3 Hard
Topic: Net Present Value
Learning Objective: 02-01 Future Values and Present Values
Bloom's: Understand
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96) State the rate of return rule.

Answer: Invest as long as the rate of return on the investment exceeds the rate of return on equivalent-risk investments in the financial market.
Difficulty: 2 Medium
Topic: Rate of Return
Learning Objective: 02-01 Future Values and Present Values
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97) Define the term *perpetuity*.

Answer: A perpetuity is defined as a sequence of equal cash flows occurring each period forever.
Difficulty: 2 Medium
Topic: Perpetuities
Learning Objective: 02-03 More Shortcuts - Growing perpetuities and Annuities
Bloom's: Remember
AACSB: Analytical Thinking
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98) Describe how you would go about finding the present value of any annuity given the formula for the present value of a perpetuity.

Answer: The present value of any annuity can be thought of as the difference between two perpetuities: one payment starting in year 1 (immediate) and one starting in year $(n + 1)$ (delayed). By calculating the difference between the present values of these two perpetuities today, we can find the present value of an annuity.
Difficulty: 2 Medium
Topic: Present Value - Annuity
Learning Objective: 02-02 Looking for Shortcuts - Perpetuities and Annuities
Bloom's: Understand
AACSB: Analytical Thinking
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99) What is the difference between simple interest and compound interest?

Answer: When money is invested at compound interest, each interest payment is reinvested to earn more interest in subsequent periods. In the simple interest case, the interest is paid only on the initial investment.
Difficulty: 2 Medium
Topic: Simple and Compound Interest
Learning Objective: 02-03 More Shortcuts - Growing perpetuities and Annuities
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100) Briefly explain continuous compounding.

Answer: As the frequency of compounding increases, the effective rate on an investment also increases. In the case of continuous compounding, the compounding frequency goes to infinity. In this case, the nature of the function also changes. The effective interest rate is given by (e^r - 1), where the value of e = 2.718, where e is the base for natural logarithms.
Difficulty: 3 Hard
Topic: Continuous Compounding
Learning Objective: 02-03 More Shortcuts - Growing perpetuities and Annuities
Bloom's: Remember
AACSB: Analytical Thinking
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