***Fina ncial Accounting, 5e* (Spiceland)**

**Appendix C: Time Value of Money**

1) The value of $1 today is worth more than $1 one year from now.

Answer: TRUE

Difficulty: 1 Easy

Topic: Simple Versus Compound Interest

Learning Objective: C-01 Contrast simple and compound interest.

Bloom's: Remember

AACSB: Reflective Thinking

AICPA/Accessibility: BB Critical Thinking/Keyboard Navigation

2) The time value of money is a concept, which means that the value of $1 increases over time.

Answer: FALSE

Explanation: Time value of money means that interest causes the value of money received today to be greater than the value of that same amount of money received in the future.

Difficulty: 1 Easy

Topic: Simple Versus Compound Interest

Learning Objective: C-01 Contrast simple and compound interest.

Bloom's: Remember

AACSB: Reflective Thinking

AICPA/Accessibility: BB Critical Thinking/Keyboard Navigation

3) Simple interest is interest earned on the initial investment only.

Answer: TRUE

Difficulty: 1 Easy

Topic: Simple Versus Compound Interest

Learning Objective: C-01 Contrast simple and compound interest.

Bloom's: Remember

AACSB: Reflective Thinking

AICPA/Accessibility: BB Critical Thinking/Keyboard Navigation

4) If you put $500 into a savings account that pays simple interest of 8% per year and then withdraw the money two years later, you will earn interest of $80.

Answer: TRUE

Explanation: Simple interest = ($500 × 8%) + ($500 × 8%) = $80.

Difficulty: 3 Hard

Topic: Simple Versus Compound Interest

Learning Objective: C-01 Contrast simple and compound interest.

Bloom's: Analyze

AACSB: Analytical Thinking

AICPA/Accessibility: FN Measurement/Keyboard Navigation

5) If you put $600 into a savings account that pays simple interest of 10% per year and then withdraw the money two years later, you will earn interest of $126.

Answer: FALSE

Explanation: Simple interest = ($600 × 10%) + ($600 × 10%) = $120.

Difficulty: 3 Hard

Topic: Simple Versus Compound Interest

Learning Objective: C-01 Contrast simple and compound interest.

Bloom's: Analyze

AACSB: Analytical Thinking

AICPA/Accessibility: FN Measurement/Keyboard Navigation

6) Compound interest is interest you earn on the initial investment and on previous interest.

Answer: TRUE

Difficulty: 1 Easy

Topic: Simple Versus Compound Interest

Learning Objective: C-01 Contrast simple and compound interest.

Bloom's: Remember

AACSB: Reflective Thinking

AICPA/Accessibility: BB Critical Thinking/Keyboard Navigation

7) If you put $200 into a savings account that pays annual compound interest of 8% per year and then withdraw the money two years later, you will earn interest of $32.

Answer: FALSE

Explanation: Compound interest = ($200 × 8%) + ($216 × 8%) = $33.28.

Difficulty: 3 Hard

Topic: Simple Versus Compound Interest

Learning Objective: C-01 Contrast simple and compound interest.

Bloom's: Analyze

AACSB: Analytical Thinking

AICPA/Accessibility: FN Measurement/Keyboard Navigation

8) If you put $300 into a savings account that pays annual compound interest of 10% per year and then withdraw the money two years later, you will earn interest of $63.

Answer: TRUE

Explanation: ($300 × 10%) + ($330 × 10%) = $63.

Difficulty: 3 Hard

Topic: Simple Versus Compound Interest

Learning Objective: C-01 Contrast simple and compound interest.

Bloom's: Analyze

AACSB: Analytical Thinking

AICPA/Accessibility: FN Measurement/Keyboard Navigation

9) Future value is how much an amount today will grow to be in the future.

Answer: TRUE

Difficulty: 1 Easy

Topic: Future Value of a Single Amount

Learning Objective: C-02 Calculate the future value and present value of a single amount.

Bloom's: Remember

AACSB: Reflective Thinking

AICPA/Accessibility: BB Critical Thinking/Keyboard Navigation

10) The more frequent the rate of compounding, the more interest that is earned on previous interest, resulting in a higher future value.

Answer: TRUE

Difficulty: 2 Medium

Topic: Future Value of a Single Amount

Learning Objective: C-02 Calculate the future value and present value of a single amount.

Bloom's: Understand

AACSB: Reflective Thinking

AICPA/Accessibility: BB Critical Thinking/Keyboard Navigation

11) Present value indicates how much a present amount of money will grow to in the future.

Answer: FALSE

Explanation: Present value indicates the value today of receiving some larger amount in the future.

Difficulty: 1 Easy

Topic: Present Value of a Single Amount

Learning Objective: C-02 Calculate the future value and present value of a single amount.

Bloom's: Remember

AACSB: Reflective Thinking

AICPA/Accessibility: BB Critical Thinking/Keyboard Navigation

12) The discount rate is the rate at which someone is willing to give up current dollars for future dollars.

Answer: TRUE

Difficulty: 1 Easy

Topic: Present Value of a Single Amount

Learning Objective: C-02 Calculate the future value and present value of a single amount.

Bloom's: Remember

AACSB: Reflective Thinking

AICPA/Accessibility: BB Critical Thinking/Keyboard Navigation

13) The future value of $1,000 invested today for three years that earns 10% compounded annually is greater than the future value of a $500 annuity with the same interest rate over the same period.

Answer: FALSE

Explanation: The three-year annuity represents three payments of $500 (= $1,500), so the annuity is greater.

Difficulty: 3 Hard

Topic: Future Value of a Single Amount; Future Value of an Annuity

Learning Objective: C-02 Calculate the future value and present value of a single amount.; C-03 Calculate the future value and present value of an annuity.

Bloom's: Analyze

AACSB: Analytical Thinking

AICPA/Accessibility: FN Measurement/Keyboard Navigation

14) The present value of $1,000 received three years from today with a discount rate of 10% is less than the present value of a $500 annuity with the same discount rate over the same period.

Answer: TRUE

Explanation: The three-year annuity represents three payments of $500 (= $1,500), so the present value of the annuity is greater.

Difficulty: 3 Hard

Topic: Present Value of a Single Amount; Present Value of an Annuity

Learning Objective: C-02 Calculate the future value and present value of a single amount.; C-03 Calculate the future value and present value of an annuity.

Bloom's: Analyze

AACSB: Analytical Thinking

AICPA/Accessibility: FN Measurement/Keyboard Navigation

15) An annuity includes cash payments of equal amounts over time periods of equal length.

Answer: TRUE

Difficulty: 1 Easy

Topic: Future Value of an Annuity; Present Value of an Annuity

Learning Objective: C-03 Calculate the future value and present value of an annuity.

Bloom's: Remember

AACSB: Reflective Thinking

AICPA/Accessibility: BB Critical Thinking/Keyboard Navigation

16) The concept that interest causes the value of money received today to be greater than the value of that same amount of money received in the future is referred to as the:

A) Monetary unit assumption.

B) Historical cost principle.

C) Time value of money.

D) Matching principle.

Answer: C

Difficulty: 1 Easy

Topic: Simple Versus Compound Interest

Learning Objective: C-01 Contrast simple and compound interest.

Bloom's: Remember

AACSB: Reflective Thinking

AICPA/Accessibility: BB Critical Thinking/Keyboard Navigation

17) Simple interest is computed as the:

A) Interest rate times the difference between the initial investment and any previous interest.

B) Interest rate times the initial investment only.

C) Interest rate times any previous interest.

D) Interest rate times the sum of the initial investment plus any previous interest.

Answer: B

Difficulty: 1 Easy

Topic: Simple Versus Compound Interest

Learning Objective: C-01 Contrast simple and compound interest.

Bloom's: Remember

AACSB: Reflective Thinking

AICPA/Accessibility: BB Critical Thinking/Keyboard Navigation

18) Which of the following is a correct statement?

A) The future value table should be used when determining how much an amount today will grow to be in the future.

B) The present value table should be used when determining how much an amount in the future is worth today.

C) The number of compounding periods and interest rate per compounding period are needed to use the future value table and the present value table.

D) All of the other answer choices are correct.

Answer: D

Difficulty: 2 Medium

Topic: Future Value of a Single Amount; Present Value of a Single Amount

Learning Objective: C-02 Calculate the future value and present value of a single amount.

Bloom's: Understand

AACSB: Reflective Thinking

AICPA/Accessibility: BB Critical Thinking/Keyboard Navigation

19) Mattison is trying to decide how much an investment of $10,000 today will grow to be in the future. Which of the following will she *not* need to help calculate that amount?

A) Future value table.

B) Present value table.

C) Number of compounding periods.

D) Interest rate.

Answer: B

Difficulty: 2 Medium

Topic: Future Value of a Single Amount

Learning Objective: C-02 Calculate the future value and present value of a single amount.

Bloom's: Understand

AACSB: Reflective Thinking

AICPA/Accessibility: BB Critical Thinking/Keyboard Navigation

20) Anna Beth would like to save $10,000 by the time she finishes college and is trying to calculate how much she should invest today. Which of the following will she *not* need to help calculate that amount?

A) Future value table.

B) Present value table.

C) Number of compounding periods.

D) Interest rate.

Answer: A

Difficulty: 2 Medium

Topic: Present Value of a Single Amount

Learning Objective: C-02 Calculate the future value and present value of a single amount.

Bloom's: Understand

AACSB: Reflective Thinking

AICPA/Accessibility: BB Critical Thinking/Keyboard Navigation

21) The value today of receiving an amount in the future is referred to as the:

A) Future value of a single amount.

B) Present value of a single amount.

C) Future value of an annuity.

D) Present value of an annuity.

Answer: B

Difficulty: 1 Easy

Topic: Present Value of a Single Amount

Learning Objective: C-02 Calculate the future value and present value of a single amount.

Bloom's: Remember

AACSB: Reflective Thinking

AICPA/Accessibility: BB Critical Thinking/Keyboard Navigation

22) The value that an amount today will grow to in the future is referred to as the:

A) Future value of a single amount.

B) Present value of a single amount.

C) Future value of an annuity.

D) Present value of an annuity.

Answer: A

Difficulty: 1 Easy

Topic: Future Value of a Single Amount

Learning Objective: C-02 Calculate the future value and present value of a single amount.

Bloom's: Remember

AACSB: Reflective Thinking

AICPA/Accessibility: BB Critical Thinking/Keyboard Navigation

23) Reba wishes to know how much would be in her savings account in five years if she deposits a given sum in an account that earns 6% interest. She should use a table for the:

A) Future value of $1.

B) Present value of $1.

C) Future value of an annuity of $1.

D) Present value of an annuity of $1.

Answer: A

Difficulty: 2 Medium

Topic: Future Value of a Single Amount

Learning Objective: C-02 Calculate the future value and present value of a single amount.

Bloom's: Understand

AACSB: Reflective Thinking

AICPA/Accessibility: BB Critical Thinking/Keyboard Navigation

24) LeAnn wishes to know how much she should set aside now at 7% interest in order to accumulate a sum of $5,000 in four years. She should use a table for the:

A) Future value of $1.

B) Present value of $1.

C) Future value of an annuity of $1.

D) Present value of an annuity of $1.

Answer: B

Difficulty: 2 Medium

Topic: Present Value of a Single Amount

Learning Objective: C-02 Calculate the future value and present value of a single amount.

Bloom's: Understand

AACSB: Reflective Thinking

AICPA/Accessibility: BB Critical Thinking/Keyboard Navigation

25) Samuel is trying to determine what it's worth today to receive $10,000 in four years at a 7% interest rate. He should use a table for the:

A) Future value of $1.

B) Present value of $1.

C) Future value of an annuity of $1.

D) Present value of an annuity of $1.

Answer: B

Difficulty: 2 Medium

Topic: Present Value of a Single Amount

Learning Objective: C-02 Calculate the future value and present value of a single amount.

Bloom's: Understand

AACSB: Reflective Thinking

AICPA/Accessibility: BB Critical Thinking/Keyboard Navigation

26) Below are excerpts from interest tables for 8% interest.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **1** | **2** | **3** | **4** |
| 1 | 1.0000 | 0.92593 | 1.08000 | 0.92593 |
| 2 | 2.0800 | 0.85734 | 1.16640 | 1.78326 |
| 3 | 3.2464 | 0.79383 | 1.25971 | 2.57710 |
| 4 | 4.5061 | 0.73503 | 1.36049 | 3.31213 |

Column 2 is an interest table for the:

A) Future value of $1.

B) Present value of $1.

C) Future value of an annuity of $1.

D) Present value of an annuity of $1.

Answer: B

Difficulty: 2 Medium

Topic: Present Value of a Single Amount

Learning Objective: C-02 Calculate the future value and present value of a single amount.

Bloom's: Understand

AACSB: Reflective Thinking

AICPA/Accessibility: BB Critical Thinking/Keyboard Navigation

27) Below are excerpts from interest tables for 8% interest.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **1** | **2** | **3** | **4** |
| 1 | 1.0000 | 0.92593 | 1.08000 | 0.92593 |
| 2 | 2.0800 | 0.85734 | 1.16640 | 1.78326 |
| 3 | 3.2464 | 0.79383 | 1.25971 | 2.57710 |
| 4 | 4.5061 | 0.73503 | 1.36049 | 3.31213 |

Column 3 is an interest table for the:

A) Future value of $1.

B) Present value of $1.

C) Future value of an annuity of $1.

D) Present value of an annuity of $1.

Answer: A

Difficulty: 2 Medium

Topic: Future Value of a Single Amount

Learning Objective: C-02 Calculate the future value and present value of a single amount.

Bloom's: Understand

AACSB: Reflective Thinking

AICPA/Accessibility: BB Critical Thinking/Keyboard Navigation

28) How much will $25,000 grow to in seven years, assuming an interest rate of 12% compounded annually? **(Use appropriate factor(s) from Table 1,** FV of $1**; Table 2,** PV of $1; **Table 3,** FVA of $1; and **Table 4,** PVA of $1 **contained within a separate file.)**

A) $55,267.

B) $46,000.

C) $61,899.

D) $52,344.

Answer: A

Explanation: FV = $25,000 × 2.21068 (Table 1; *n* = 7; *i =* 12%) = $55,267.

Difficulty: 3 Hard

Topic: Future Value of a Single Amount

Learning Objective: C-02 Calculate the future value and present value of a single amount.

Bloom's: Analyze

AACSB: Analytical Thinking

AICPA/Accessibility: FN Measurement/Keyboard Navigation

29) How much will $8,000 grow to in five years, assuming an interest rate of 8% compounded quarterly? **(Use appropriate factor(s) from Table 1,** FV of $1**; Table 2,** PV of $1; **Table 3,** FVA of $1; and **Table 4,** PVA of $1 **contained within a separate file.)**

A) $10,989.

B) $11,755.

C) $11,888.

D) $12,013.

Answer: C

Explanation: FV = $8,000 × 1.48595 (Table 1; *n* = 20; *i* = 2%) = $11,888.

Difficulty: 3 Hard

Topic: Future Value of a Single Amount

Learning Objective: C-02 Calculate the future value and present value of a single amount.

Bloom's: Analyze

AACSB: Analytical Thinking

AICPA/Accessibility: FN Measurement/Keyboard Navigation

30) What is the value today of receiving $2,500 at the end of three years, assuming an interest rate of 9% compounded annually? **(Use appropriate factor(s) from Table 1,** FV of $1**; Table 2,** PV of $1; **Table 3,** FVA of $1; and **Table 4,** PVA of $1 **contained within a separate file.)**

A) $1,984.

B) $1,930.

C) $2,104.

D) $3,238.

Answer: B

Explanation: PV = $2,500 × 0.77218 (Table 2; *n* = 3; *i* = 9%) = $1,930.

Difficulty: 3 Hard

Topic: Present Value of a Single Amount

Learning Objective: C-02 Calculate the future value and present value of a single amount.

Bloom's: Analyze

AACSB: Analytical Thinking

AICPA/Accessibility: FN Measurement/Keyboard Navigation

31) What is the value today of receiving $5,000 at the end of six years, assuming an interest rate of 8% compounded semiannually? **(Use appropriate factor(s) from Table 1,** FV of $1**; Table 2,** PV of $1; **Table 3,** FVA of $1; and **Table 4,** PVA of $1 **contained within a separate file.)**

A) $3,151.

B) $3,203.

C) $3,428.

D) $3,123.

Answer: D

Explanation: PV = $5,000 × 0.62460 (Table 2; *n* = 12; *i* = 4%) = $3,123.

Difficulty: 3 Hard

Topic: Present Value of a Single Amount

Learning Objective: C-02 Calculate the future value and present value of a single amount.

Bloom's: Analyze

AACSB: Analytical Thinking

AICPA/Accessibility: FN Measurement/Keyboard Navigation

32) Davenport Inc. offers a new employee two options. First, the employee can receive a one-time signing bonus at the date of employment. Second, the employee can take $30,000 at the date of employment and another $50,000 two years later. Assuming the employee's time value of money is 8% annually, what single payment in the first option would be equal to the total of the payments in the second option? **(Use appropriate factor(s) from Table 1,** FV of $1**; Table 2,** PV of $1; **Table 3,** FVA of $1; and **Table 4,** PVA of $1 **contained within a separate file.)**

A) $60,000.

B) $62,867.

C) $72,867.

D) $80,000.

Answer: C

Explanation: The one-time equivalent would be $30,000 + the present value of $50,000 where n = 2 and i = 8%.

That is, $30,000 + ($50,000 × 0.85734 from Table 2) = $72,867.

Difficulty: 3 Hard

Topic: Present Value of a Single Amount

Learning Objective: C-02 Calculate the future value and present value of a single amount.

Bloom's: Analyze

AACSB: Analytical Thinking

AICPA/Accessibility: FN Measurement/Keyboard Navigation

33) Today, Thomas deposited $100,000 in a three-year, 12% CD that compounds quarterly. What is the maturity value of the CD? **(Use appropriate factor(s) from Table 1,** FV of $1**; Table 2,** PV of $1; **Table 3,** FVA of $1; and **Table 4,** PVA of $1 **contained within a separate file.)**

A) $109,270.

B) $119,410.

C) $142,576.

D) $309,090.

Answer: C

Explanation: FV = $100,000 × 1.42576 (Table 1; *n* = 12; *i* = 3%) = $142,576.

Difficulty: 3 Hard

Topic: Future Value of a Single Amount

Learning Objective: C-02 Calculate the future value and present value of a single amount.

Bloom's: Analyze

AACSB: Analytical Thinking

AICPA/Accessibility: FN Measurement/Keyboard Navigation

34) Today, King deposited $500,000 in an investment account that is expected to return 8%, compounded semiannually. What amount is expected to be in the account in four years? (**(Use appropriate factor(s) from Table 1,** FV of $1**; Table 2,** PV of $1; **Table 3,** FVA of $1; and **Table 4,** PVA of $1 **contained within a separate file.)**

A) $680,245.

B) $687,129.

C) $684,285.

D) $668,352.

Answer: C

Explanation: FV = $500,000 × 1.36857 (Table 1; *n* =8*; i* =4%) = $684,285.

Difficulty: 3 Hard

Topic: Future Value of a Single Amount

Learning Objective: C-02 Calculate the future value and present value of a single amount.

Bloom's: Analyze

AACSB: Analytical Thinking

AICPA/Accessibility: FN Measurement/Keyboard Navigation

35) Carol wants to invest money in a 6% CD that compounds semiannually. Carol would like the account to have a balance of $50,000 five years from now. How much must Carol deposit to accomplish her goal? **(Use appropriate factor(s) from Table 1,** FV of $1**; Table 2,** PV of $1; **Table 3,** FVA of $1; and **Table 4,** PVA of $1 **contained within a separate file.)**

A) $35,069.

B) $43,131.

C) $37,205.

D) $35,000.

Answer: C

Explanation: PV = $50,000 × 0.74409 (Table 2; *n* = 10; *i* = 3%) = $37,205.

Difficulty: 3 Hard

Topic: Present Value of a Single Amount

Learning Objective: C-02 Calculate the future value and present value of a single amount.

Bloom's: Analyze

AACSB: Analytical Thinking

AICPA/Accessibility: FN Measurement/Keyboard Navigation

36) Shane wants to invest money in a 6% CD that compounds semiannually. Shane would like the account to have a balance of $100,000 four years from now. How much must Shane deposit to accomplish his goal? **(Use appropriate factor(s) from Table 1,** FV of $1**; Table 2,** PV of $1; **Table 3,** FVA of $1; and **Table 4,** PVA of $1 **contained within a separate file.)**

A) $88,848.

B) $78,941.

C) $25,336.

D) $22,510.

Answer: B

Explanation: PV = $100,000 × 0.78941 (Table 2; *n* = 8; *i* = 3%) = $78,941.

Difficulty: 3 Hard

Topic: Present Value of a Single Amount

Learning Objective: C-02 Calculate the future value and present value of a single amount.

Bloom's: Analyze

AACSB: Analytical Thinking

AICPA/Accessibility: FN Measurement/Keyboard Navigation

37) Bill wants to give Maria a $500,000 gift in seven years. If money is worth 6% compounded semiannually, what is Maria's gift worth today? **(Use appropriate factor(s) from Table 1,** FV of $1**; Table 2,** PV of $1; **Table 3,** FVA of $1; and **Table 4,** PVA of $1 **contained within a separate file.)**

A) $66,110.

B) $81,310.

C) $406,550.

D) $330,560.

Answer: D

Explanation: PV = $500,000 × 0.66112 (Table 2; *n* = 14; *i* = 3%) = $330,560.

Difficulty: 3 Hard

Topic: Present Value of a Single Amount

Learning Objective: C-02 Calculate the future value and present value of a single amount.

Bloom's: Analyze

AACSB: Analytical Thinking

AICPA/Accessibility: FN Measurement/Keyboard Navigation

38) At the end of each of the next four years, a new machine is expected to generate net cash flows of $8,000, $12,000, $10,000, and $15,000, respectively. What are the cash flows worth today if a 3% interest rate properly reflects the time value of money in this situation? **(Use appropriate factor(s) from Table 1,** FV of $1**; Table 2,** PV of $1; **Table 3,** FVA of $1; and **Table 4,** PVA of $1 **contained within a separate file.)**

A) $41,557.

B) $47,700.

C) $32,403.

D) $38,108.

Answer: A

Explanation: PV = ($8,000 × 0.97087) + ($12,000 × 0.94260) + ($10,000 × 0.91514) + ($15,000 × 0.88849) = $41,557.

Difficulty: 3 Hard

Topic: Present Value of a Single Amount

Learning Objective: C-02 Calculate the future value and present value of a single amount.

Bloom's: Analyze

AACSB: Analytical Thinking

AICPA/Accessibility: FN Measurement/Keyboard Navigation

39) At the end of each of the next five years, an investment is expected to generate net cash flows of $5,000, $6,000, $7,000, $5,000, and $4,000, respectively. What are the cash flows worth today if a 6% interest rate properly reflects the time value of money in this situation? **(Use appropriate factor(s) from Table 1,** FV of $1**; Table 2,** PV of $1; **Table 3,** FVA of $1; and **Table 4,** PVA of $1 **contained within a separate file.)**

A) $21,781.

B) $22,884.

C) $22,560.

D) $23,142.

Answer: B

Explanation: PV = ($5,000 × 0.94340) + ($6,000 × 0.89000) + ($7,000 × 0.83962) + ($5,000 × 0.79209) + ($4,000 × 0.74726) = $22,884.

Difficulty: 3 Hard

Topic: Present Value of a Single Amount

Learning Objective: C-02 Calculate the future value and present value of a single amount.

Bloom's: Analyze

AACSB: Analytical Thinking

AICPA/Accessibility: FN Measurement/Keyboard Navigation

40) Monica wants to sell her share of an investment to Barney for $50,000 in three years. If money is worth 6% compounded semiannually, what would Monica accept today? **(Use appropriate factor(s) from Table 1,** FV of $1**; Table 2,** PV of $1; **Table 3,** FVA of $1; and **Table 4,** PVA of $1 **contained within a separate file.)**

A) $8,375.

B) $41,874.

C) $11,941.

D) $41,000.

Answer: B

Explanation: PV = $50,000 × 0.83748 (Table 2; *n* = 6; *i* = 3%) = $41,874.

Difficulty: 3 Hard

Topic: Present Value of a Single Amount

Learning Objective: C-02 Calculate the future value and present value of a single amount.

Bloom's: Analyze

AACSB: Analytical Thinking

AICPA/Accessibility: FN Measurement/Keyboard Navigation

41) How much must be invested now at 9% interest to accumulate to $10,000 in five years? **(Use appropriate factor(s) from Table 1,** FV of $1**; Table 2,** PV of $1; **Table 3,** FVA of $1; and **Table 4,** PVA of $1 **contained within a separate file.)**

A) $9,176.

B) $6,499.

C) $5,500.

D) $5,960.

Answer: B

Explanation: PV = $10,000 × 0.64993 (Table 2; *n* = 5, *i* = 9%) = $6,499.

Difficulty: 3 Hard

Topic: Present Value of a Single Amount

Learning Objective: C-02 Calculate the future value and present value of a single amount.

Bloom's: Analyze

AACSB: Analytical Thinking

AICPA/Accessibility: FN Measurement/Keyboard Navigation

42) How much must be invested now at 6% interest to accumulate to $50,000 in ten years? **(Use appropriate factor(s) from Table 1,** FV of $1**; Table 2,** PV of $1; **Table 3,** FVA of $1; and **Table 4,** PVA of $1 **contained within a separate file.)**

A) $29,937.

B) $22,366.

C) $28,224.

D) $27,920.

Answer: D

Explanation: PV = $50,000 × 0.55839 (Table 2; *n* = 10, *i* = 6%) = $27,920.

Difficulty: 3 Hard

Topic: Present Value of a Single Amount

Learning Objective: C-02 Calculate the future value and present value of a single amount.

Bloom's: Analyze

AACSB: Analytical Thinking

AICPA/Accessibility: FN Measurement/Keyboard Navigation

43) The value today of receiving a series of equal payments in the future is referred to as the:

A) Future value of a single amount.

B) Present value of a single amount.

C) Future value of an annuity.

D) Present value of an annuity.

Answer: D

Difficulty: 1 Easy

Topic: Present Value of an Annuity

Learning Objective: C-03 Calculate the future value and present value of an annuity.

Bloom's: Remember

AACSB: Reflective Thinking

AICPA/Accessibility: BB Critical Thinking/Keyboard Navigation

44) The value that a series of equal payments will grow to in the future is referred to as the:

A) Future value of a single amount.

B) Present value of a single amount.

C) Future value of an annuity.

D) Present value of an annuity.

Answer: C

Difficulty: 1 Easy

Topic: Future Value of an Annuity

Learning Objective: C-03 Calculate the future value and present value of an annuity.

Bloom's: Remember

AACSB: Reflective Thinking

AICPA/Accessibility: BB Critical Thinking/Keyboard Navigation

45) A series of equal periodic payments is referred to as:

A) The time value of money.

B) An annuity.

C) The future value.

D) Interest.

Answer: B

Difficulty: 1 Easy

Topic: Future Value of an Annuity; Present Value of an Annuity

Learning Objective: C-03 Calculate the future value and present value of an annuity.

Bloom's: Remember

AACSB: Reflective Thinking

AICPA/Accessibility: BB Critical Thinking/Keyboard Navigation

46) How much will $5,000 invested at the end of each year grow to in six years, assuming an interest rate of 7% compounded annually? **(Use appropriate factor(s) from Table 1,** FV of $1**; Table 2,** PV of $1; **Table 3,** FVA of $1; and **Table 4,** PVA of $1 **contained within a separate file.)**

A) $35,766.

B) $26,813.

C) $23,833.

D) $7,504.

Answer: A

Explanation: FVA = $5,000 × 7.1533 (Table 3; *n* = 6; *i* = 7%) = $35,766.

Difficulty: 3 Hard

Topic: Future Value of an Annuity

Learning Objective: C-03 Calculate the future value and present value of an annuity.

Bloom's: Analyze

AACSB: Analytical Thinking

AICPA/Accessibility: FN Measurement/Keyboard Navigation

47) How much will $1,000 invested at the end of each year grow to in 20 years, assuming an interest rate of 10% compounded annually? **(Use appropriate factor(s) from Table 1,** FV of $1**; Table 2,** PV of $1; **Table 3,** FVA of $1; and **Table 4,** PVA of $1 **contained within a separate file.)**

A) $6,728.

B) $8,514.

C) $83,159.

D) $57,275.

Answer: D

Explanation: FVA = $1,000 × 57.2750 (Table 3; *n* = 20; *i* = 10%) = $57,275.

Difficulty: 3 Hard

Topic: Future Value of an Annuity

Learning Objective: C-03 Calculate the future value and present value of an annuity.

Bloom's: Analyze

AACSB: Analytical Thinking

AICPA/Accessibility: FN Measurement/Keyboard Navigation

48) What is the value today of receiving $5,000 at the end of each year for the next 10 years, assuming an interest rate of 12% compounded annually? **(Use appropriate factor(s) from Table 1,** FV of $1**; Table 2,** PV of $1; **Table 3,** FVA of $1; and **Table 4,** PVA of $1 **contained within a separate file.)**

A) $87,744.

B) $28,251.

C) $50,000.

D) $15,529.

Answer: B

Explanation: PVA = $5,000 × 5.65022 (Table 4; *n* = 10; *i* = 12%) = $28,251.

Difficulty: 3 Hard

Topic: Present Value of an Annuity

Learning Objective: C-03 Calculate the future value and present value of an annuity.

Bloom's: Analyze

AACSB: Analytical Thinking

AICPA/Accessibility: FN Measurement/Keyboard Navigation

49) What is the value today of receiving $3,000 at the end of each year for the next three years, assuming an interest rate of 3% compounded annually? **(Use appropriate factor(s) from Table 1,** FV of $1**; Table 2,** PV of $1; **Table 3,** FVA of $1; and **Table 4,** PVA of $1 **contained within a separate file.)**

A) $8,486.

B) $8,251.

C) $9,000.

D) $9,273.

Answer: A

Explanation: PVA = $3,000 × 2.82861 (Table 4; *n* = 3; *i* = 3%) = $8,486.

Difficulty: 3 Hard

Topic: Present Value of an Annuity

Learning Objective: C-03 Calculate the future value and present value of an annuity.

Bloom's: Analyze

AACSB: Analytical Thinking

AICPA/Accessibility: FN Measurement/Keyboard Navigation

50) What is the value today of receiving $5,000 at the end of each six-month period for the next four years, assuming an interest rate of 4% compounded semi-annually?

A) $34,512.

B) $32,459.

C) $33,664.

D) $36,627.

Answer: D

Explanation: PVA = $5,000 × 7.32548 (Table 4; *n* = 8; *i* = 2%) = $36,627.

Difficulty: 3 Hard

Topic: Present Value of an Annuity

Learning Objective: C-03 Calculate the future value and present value of an annuity.

Bloom's: Analyze

AACSB: Analytical Thinking

AICPA/Accessibility: FN Measurement/Keyboard Navigation

51) Tammy wants to buy a car that costs $10,000 and wishes to know the amount of the monthly payments, which will be made at the end of the month, with interest of 12% on the unpaid balance. She should use a table for the:

A) Future value of $1.

B) Present value of $1.

C) Future value of an annuity of $1.

D) Present value of an annuity of $1.

Answer: D

Difficulty: 2 Medium

Topic: Present Value of an Annuity

Learning Objective: C-03 Calculate the future value and present value of an annuity.

Bloom's: Understand

AACSB: Reflective Thinking

AICPA/Accessibility: BB Critical Thinking/Keyboard Navigation

52) George Jones is planning on a cruise for his 70th birthday party. He wants to know how much he should set aside at the end of each month at 6% interest to accumulate the sum of $4,800 in five years. He should use a table for the:

A) Future value of $1.

B) Present value of $1.

C) Future value of an annuity of $1.

D) Present value of an annuity of $1.

Answer: C

Difficulty: 2 Medium

Topic: Future Value of an Annuity

Learning Objective: C-03 Calculate the future value and present value of an annuity.

Bloom's: Understand

AACSB: Reflective Thinking

AICPA/Accessibility: BB Critical Thinking/Keyboard Navigation

53) Zulu Corporation hires a new chief executive officer and promises to pay her a signing bonus of $2 million per year for 10 years, starting at the end of the first year. The value of this signing bonus is:

A) The present value of the annuity.

B) The future value of the annuity.

C) $20 million.

D) $0 because no cash is owed immediately.

Answer: A

Difficulty: 2 Medium

Topic: Present Value of an Annuity

Learning Objective: C-03 Calculate the future value and present value of an annuity.

Bloom's: Understand

AACSB: Reflective Thinking

AICPA/Accessibility: BB Critical Thinking/Keyboard Navigation

54) Sandra won $5,000,000 in the state lottery, which she has elected to receive at the end of each month over the next thirty years. She will receive 7% interest on unpaid amounts. To determine the amount of her monthly check, she should use a table for the:

A) Future value of $1.

B) Present value of $1.

C) Future value of an annuity of $1.

D) Present value of an annuity of $1.

Answer: D

Difficulty: 2 Medium

Topic: Present Value of an Annuity

Learning Objective: C-03 Calculate the future value and present value of an annuity.

Bloom's: Understand

AACSB: Reflective Thinking

AICPA/Accessibility: BB Critical Thinking/Keyboard Navigation

55) Below are excerpts from interest tables for 8% interest.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **1** | **2** | **3** | **4** |
| 1 | 1.0000 | 0.92593 | 1.08000 | 0.92593 |
| 2 | 2.0800 | 0.85734 | 1.16640 | 1.78326 |
| 3 | 3.2464 | 0.79383 | 1.25971 | 2.57710 |
| 4 | 4.5061 | 0.73503 | 1.36049 | 3.31213 |

Column 4 is an interest table for the:

A) Future value of $1.

B) Present value of $1.

C) Future value of an annuity of $1.

D) Present value of an annuity of $1.

Answer: D

Difficulty: 2 Medium

Topic: Present Value of an Annuity

Learning Objective: C-03 Calculate the future value and present value of an annuity.

Bloom's: Understand

AACSB: Reflective Thinking

AICPA/Accessibility: BB Critical Thinking/Keyboard Navigation

56) Below are excerpts from interest tables for 8% interest.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **1** | **2** | **3** | **4** |
| 1 | 1.0000 | 0.92593 | 1.08000 | 0.92593 |
| 2 | 2.0800 | 0.85734 | 1.16640 | 1.78326 |
| 3 | 3.2464 | 0.79383 | 1.25971 | 2.57710 |
| 4 | 4.5061 | 0.73503 | 1.36049 | 3.31213 |

Column 1 is an interest table for the:

A) Future value of $1.

B) Present value of $1.

C) Future value of an annuity of $1.

D) Present value of an annuity of $1.

Answer: C

Difficulty: 2 Medium

Topic: Future Value of an Annuity

Learning Objective: C-03 Calculate the future value and present value of an annuity.

Bloom's: Understand

AACSB: Reflective Thinking

AICPA/Accessibility: BB Critical Thinking/Keyboard Navigation

57) Quaker State Inc. offers a new employee two options. First, the employee can receive a one-time signing bonus at the date of employment. Second, the employee can take $8,000 at the date of employment plus $20,000 at the end of each of his first three years of service. Assuming the employee's time value of money is 10% annually, what single payment in the first option would be equal to the total of the payments in the second option? **(Use appropriate factor(s) from Table 1,** FV of $1**; Table 2,** PV of $1; **Table 3,** FVA of $1; and **Table 4,** PVA of $1 **contained within a separate file.)**

A) $23,026.

B) $57,737.

C) $62,711.

D) None of the choices are correct.

Answer: B

Explanation: The one-time equivalent would be $8,000 + the present value of a $20,000 annuity where *n* = 3, and *i* = 10%.

That is, $8,000 + ($20,000 × 2.48685 from Table 4) = $57,737.

Difficulty: 3 Hard

Topic: Present Value of an Annuity

Learning Objective: C-03 Calculate the future value and present value of an annuity.

Bloom's: Analyze

AACSB: Analytical Thinking

AICPA/Accessibility: FN Measurement/Keyboard Navigation

58) At the end of each quarter, Patti deposits $500 into an account that pays 12% interest compounded quarterly. How much will Patti have in the account in three years? **(Use appropriate factor(s) from Table 1,** FV of $1**; Table 2,** PV of $1; **Table 3,** FVA of $1; and **Table 4,** PVA of $1 **contained within a separate file.)**

A) $7,096.

B) $7,013.

C) $7,129.

D) $8,880.

Answer: A

Explanation: FVA = $500 × 14.1920 (Table 3; *n* = 12; *i* = 3%) = $7,096.

Difficulty: 3 Hard

Topic: Future Value of an Annuity

Learning Objective: C-03 Calculate the future value and present value of an annuity.

Bloom's: Analyze

AACSB: Analytical Thinking

AICPA/Accessibility: FN Measurement/Keyboard Navigation

59) Every six months, Scott deposits $2,500 into an account that pays 10% interest compounded semi-annually. How much will Scott have in the account in four years? **(Use appropriate factor(s) from Table 1,** FV of $1**; Table 2,** PV of $1; **Table 3,** FVA of $1; and **Table 4,** PVA of $1 **contained within a separate file.)**

A) $22,749.

B) $23,873.

C) $23,205.

D) $28,590.

Answer: B

Explanation: FVA = $2,500 × 9.5491 (Table 3; *n* = 8; *i* = 5%) = $23,873.

Difficulty: 3 Hard

Topic: Future Value of an Annuity

Learning Objective: C-03 Calculate the future value and present value of an annuity.

Bloom's: Analyze

AACSB: Analytical Thinking

AICPA/Accessibility: FN Measurement/Keyboard Navigation

60) Miller borrows $300,000 to be paid off in three years. The loan payments are semiannual with the first payment due in six months, and interest is at 6%. What is the amount of each payment? **(Use appropriate factor(s) from Table 1,** FV of $1**; Table 2,** PV of $1; **Table 3,** FVA of $1; and **Table 4,** PVA of $1 **contained within a separate file.)**

A) $55,379.

B) $106,059.

C) $30,138.

D) $60,276.

Answer: A

Explanation: $300,000/5.41719 (Table 4; *n* = 6; *i* = 3%) = $55,379.

Difficulty: 3 Hard

Topic: Present Value of an Annuity

Learning Objective: C-03 Calculate the future value and present value of an annuity.

Bloom's: Analyze

AACSB: Analytical Thinking

AICPA/Accessibility: FN Measurement/Keyboard Navigation

61) Claudine Corporation will deposit $5,000 into a money market account at the end of each year for the next five years. How much will accumulate by the end of the fifth and final payment if the account earns 9% interest? **(Use appropriate factor(s) from Table 1,** FV of $1**; Table 2,** PV of $1; **Table 3,** FVA of $1; and **Table 4,** PVA of $1 **contained within a separate file.)**

A) $32,617.

B) $29,924.

C) $27,250.

D) $26,800.

Answer: B

Explanation: FVA = $5,000 × 5.9847 (Table 3; *n* = 5; *i* = 9%) = $29,924.

Difficulty: 3 Hard

Topic: Future Value of an Annuity

Learning Objective: C-03 Calculate the future value and present value of an annuity.

Bloom's: Analyze

AACSB: Analytical Thinking

AICPA/Accessibility: FN Measurement/Keyboard Navigation

62) What is the value today of receiving five annual payments of $500,000, beginning one year from now, assuming an 11% discount rate? **(Use appropriate factor(s) from Table 1,** FV of $1**; Table 2,** PV of $1; **Table 3,** FVA of $1; and **Table 4,** PVA of $1 **contained within a separate file.)**

A) $2,500,000.

B) $2,225,000.

C) $1,847,950.

D) $2,115,270.

Answer: C

Explanation: PVA = $500,000 × 3.69590 (Table 4; *n* = 5; *i* = 11%) = $1,847,950.

Difficulty: 3 Hard

Topic: Present Value of an Annuity

Learning Objective: C-03 Calculate the future value and present value of an annuity.

Bloom's: Analyze

AACSB: Analytical Thinking

AICPA/Accessibility: FN Measurement/Keyboard Navigation

63) Listed below are ten terms followed by a list of phrases that describe or characterize five of the terms. Match each phrase with the best term placing the letter designating the term in the space provided.

**Terms:**

a. Annuity

b. Future value of a single amount

c. Discount rate

d. Future value of an annuity

e. Interest

f. Compound interest

g. Present value of a single amount

h. Time value of money

i. Simple interest

j. Present value of an annuity

**Phrases:**

\_\_\_\_\_ A dollar now is worth more than a dollar later.

\_\_\_\_\_ A series of equal periodic payments.

\_\_\_\_\_ Accumulation of a series of equal payments.

\_\_\_\_\_ Interest earned on the initial investment and on previous interest.

\_\_\_\_\_ Accumulation of an amount with interest.

Answer: h; a; d; f; b

Difficulty: 2 Medium

Topic: Simple Versus Compound Interest; Future Value of a Single Amount; Present Value of a Single Amount; Future Value of an Annuity; Present Value of an Annuity

Learning Objective: C-01 Contrast simple and compound interest.; C-02 Calculate the future value and present value of a single amount.; C-03 Calculate the future value and present value of an annuity.

Bloom's: Understand

AACSB: Reflective Thinking

AICPA/Accessibility: BB Critical Thinking/Keyboard Navigation

64) Listed below are ten terms followed by a list of phrases that describe or characterize five of the terms. Match each phrase with the best term placing the letter designating the term in the space provided.

**Terms:**

a. Annuity

b. Future value of a single amount

c. Discount rate

d. Future value of an annuity

e. Interest

f. Compound interest

g. Present value of a single amount

h. Time value of money

i. Simple interest

j. Present value of an annuity

**Phrases:**

\_\_\_\_\_ Amount today equivalent to a specified future amount.

\_\_\_\_\_ The rate at which future dollars are equal to current dollars.

\_\_\_\_\_ Interest earned on the initial investment only.

\_\_\_\_\_ The factor that causes money today to be worth more than

the same amount in the future.

\_\_\_\_\_ Current worth of a series of equal payments received in the future.

Answer: g; c; i; e; j

Difficulty: 2 Medium

Topic: Simple Versus Compound Interest; Future Value of a Single Amount; Present Value of a Single Amount; Future Value of an Annuity; Present Value of an Annuity

Learning Objective: C-01 Contrast simple and compound interest.; C-02 Calculate the future value and present value of a single amount.; C-03 Calculate the future value and present value of an annuity.

Bloom's: Understand

AACSB: Reflective Thinking

AICPA/Accessibility: BB Critical Thinking/Keyboard Navigation

65) Compute the future value of the following invested amounts at the specified periods and interest rates.

|  |  |  |  |
| --- | --- | --- | --- |
| Item | Invested Amount | Interest  Rate | Number of Periods |
| a. | $20,000 | 8% | 10 |
| b. | $30,000 | 4% | 8 |
| c. | $10,000 | 12% | 15 |

Answer: a. $43,178; b. $41,057; c. $54,736.

a. FV = $20,000 × 2.15892 (Table 1; n = 10; i = 8%) = $43,178.

b. FV = $30,000 × 1.36857 (Table 1; n = 8; i = 4%) = $41,057.

c. FV = $10,000 × 5.47357 (Table 1; n = 15; i = 12%) = $54,736.

Difficulty: 3 Hard

Topic: Future Value of a Single Amount

Learning Objective: C-02 Calculate the future value and present value of a single amount.

Bloom's: Analyze

AACSB: Analytical Thinking

AICPA/Accessibility: FN Measurement/Keyboard Navigation

66) Anthony would like to have $18,000 to buy a new car in three years. Currently, he has saved $15,000. If he puts $15,000 in an account that earns 6% interest, compounded annually, will he be able to buy the car in three years?

Answer: No.

FV = $15,000 × 1.19102 (Table 1; n = 3; i = 6%) = $17,865, which is less than the $18,000 desired amount.

Difficulty: 3 Hard

Topic: Future Value of a Singe Amount

Learning Objective: C-02 Calculate the future value and present value of a single amount.

Bloom's: Analyze

AACSB: Analytical Thinking

AICPA/Accessibility: FN Measurement/Keyboard Navigation

67) Michaela would like to have $10,000 for a European vacation in four years. Currently, she has saved $8,000. If she puts $8,000 in an account that earns 6% interest, compounded annually, will she be able to take the vacation in four years?

Answer: Yes.

FV = $8,000 × 1.26248 (Table 1; n = 4; i = 6%) = $10,100, which is more than the $10,000 desired amount.

Difficulty: 3 Hard

Topic: Future Value of a Single Amount

Learning Objective: C-02 Calculate the future value and present value of a single amount.

Bloom's: Analyze

AACSB: Analytical Thinking

AICPA/Accessibility: FN Measurement/Keyboard Navigation

68) Compute the present value of the following single amounts to be received at the end of the specified period at the given interest rate.

|  |  |  |  |
| --- | --- | --- | --- |
| Item | Invested Amount | Interest  Rate | Number of Periods |
| a. | $40,000 | 7% | 20 |
| b. | $20,000 | 6% | 25 |
| c. | $50,000 | 11% | 10 |

Answer: a. $10,337; b. $4,660; c. $17,609.

a. PV = $40,000 × 0.25842 (Table 2; n = 20; i = 7%) = $10,337.

b. PV = $20,000 × 0.23300 (Table 2; n = 25; i = 6%) = $4,660.

c. PV = $50,000 × 0.35218 (Table 2; n = 10; i = 11%) = $17,609.

Difficulty: 3 Hard

Topic: Present Value of a Single Amount

Learning Objective: C-02 Calculate the future value and present value of a single amount.

Bloom's: Analyze

AACSB: Analytical Thinking

AICPA/Accessibility: FN Measurement/Keyboard Navigation

69) Compute the present value of the following single amounts to be received at the end of the specified period at the given interest rate.

|  |  |  |  |
| --- | --- | --- | --- |
| Item | Invested Amount | Interest  Rate | Number of Periods |
| a. | $1,500 | 10% | 1 |
| b. | $1,500 | 10% | 2 |
| c. | $1,500 | 10% | 3 |
| d. | $1,500 | 10% | 4 |

Answer: a. $1,364; b. $1,240; c. $1,127; d. $1,025.

a. PV = $1,500 × 0.90909 (Table 2; n = 1; i = 10%) = $1,364.

b. PV = $1,500 × 0.82645 (Table 2; n = 2; i = 10%) = $1,240.

c. PV = $1,500 × 0.75131 (Table 2; n = 3; i = 10%) = $1,127.

d. PV = $1,500 × 0.68301 (Table 2; n = 4; i = 10%) = $1,025.

Difficulty: 3 Hard

Topic: Present Value of a Single Amount

Learning Objective: C-02 Calculate the future value and present value of a single amount.

Bloom's: Analyze

AACSB: Analytical Thinking

AICPA/Accessibility: FN Measurement/Keyboard Navigation

70) If you had an investment opportunity that promises to pay you $20,000 in three years and you could earn a 10% annual return investing your money elsewhere, what is the most you should be willing to invest today in this opportunity?

Answer: $15,026.

PV = $20,000 × 0.75131 (Table 2; n = 3; i = 10%) = $15,026.

Difficulty: 3 Hard

Topic: Present Value of a Single Amount

Learning Objective: C-02 Calculate the future value and present value of a single amount.

Bloom's: Analyze

AACSB: Analytical Thinking

AICPA/Accessibility: FN Measurement/Keyboard Navigation

71) Touche Manufacturing is considering a rearrangement of its manufacturing operations. A consultant estimates that the rearrangement should result in after-tax cash savings of $6,000 the first year, $10,000 for the next two years, and $12,000 for the next two years. Assuming a 12% discount rate, calculate the total present value of the cash flows.

Answer: $34,882

|  |  |  |  |
| --- | --- | --- | --- |
| Year | Cash  Flow | PV | Present Value |
| 1 | $ 6,000 | 0.89286 (Table 2; n = 1; i = 12%) | $ 5,357 |
| 2 | 10,000 | 0.79719 (Table 2; n = 2; i = 12%) | 7,972 |
| 3 | 10,000 | 0.71178 (Table 2; n = 3; i = 12%) | 7,118 |
| 4 | 12,000 | 0.63552 (Table 2; n = 4; i = 12%) | 7,626 |
| 5 | 12,000 | 0.56743 (Table 2; n = 5; i = 12%) | 6,809 |

Total PV of Cash Savings $34,882

Difficulty: 3 Hard

Topic: Present Value of a Single Amount

Learning Objective: C-02 Calculate the future value and present value of a single amount.

Bloom's: Analyze

AACSB: Analytical Thinking

AICPA/Accessibility: FN Measurement/Keyboard Navigation

72) Price Mart is considering outsourcing its billing operations. A consultant estimates that outsourcing should result in after-tax cash savings of $9,000 the first year, $15,000 for the next two years, and $18,000 for the next two years. Assuming a 12% discount rate, calculate the total present value of the cash flows.

Answer: $52,324.

|  |  |  |  |
| --- | --- | --- | --- |
| Year | Cash  Flow | PV | Present Value |
| 1 | $ 9,000 | 0.89286 (Table 2; n = 1; i = 12%) | $ 8,036 |
| 2 | 15,000 | 0.79719 (Table 2; n = 2; i = 12%) | 11,958 |
| 3 | 15,000 | 0.71178 (Table 2; n = 3; i = 12%) | 10,677 |
| 4 | 18,000 | 0.63552 (Table 2; n = 4; i = 12%) | 11,439 |
| 5 | 18,000 | 0.56743 (Table 2; n = 5; i = 12%) | 10,214 |

Total PV of Cash Savings $52,324

Difficulty: 3 Hard

Topic: Present Value of a Single Amount

Learning Objective: C-02 Calculate the future value and present value of a single amount.

Bloom's: Analyze

AACSB: Analytical Thinking

AICPA/Accessibility: FN Measurement/Keyboard Navigation

73) Hillsdale is considering two options for comparable computer software. Option A will cost $25,000 plus annual license renewals of $1,000 for three years, which includes technical support. Option B will cost $20,000 with technical support being an add-on charge. The estimated cost of technical support is $4,000 the first year, $3,000 the second year, and $2,000 the third year. Assume the software is purchased and paid for at the beginning of year one, but that technical support is paid for at the end of each year. The discount rate is 8%. Ignore income taxes. Determine which option should be chosen based on present value considerations.

Answer: Option A should be chosen because it has the lower cost based on present value considerations.

|  |  |  |  |
| --- | --- | --- | --- |
| **Option A.** |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Year** | Cash Flow | PV | Present Value |
| 0 | $25,000 | 1.00000 | $25,000 |
| 1 | 1,000 | 0.92593 (Table 2; n = 1; i = 8%) | 926 |
| 2 | 1,000 | 0.85734 (Table 2; n = 2; i = 8%) | 857 |
| 3 | 1,000 | 0.79383 (Table 2; n = 3; i = 8%) | 794 |
|  |  |  | $27,577 |
|  |  |  |  |
| **Option B.** |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Year** | Cash Flow | PV | Present Value |
| 0 | $20,000 | 1.00000 | $20,000 |
| 1 | 4,000 | 0.92593 (Table 2; n = 1; i = 8%) | 3,704 |
| 2 | 3,000 | 0.85734 (Table 2; n = 2; i = 8%) | 2,572 |
| 3 | 2,000 | 0.79383 (Table 2; n = 3; i = 8%) | 1,588 |
|  |  |  | $27,864 |

Difficulty: 3 Hard

Topic: Present Value of a Single Amount

Learning Objective: C-02 Calculate the future value and present value of a single amount.

Bloom's: Analyze

AACSB: Analytical Thinking

AICPA/Accessibility: FN Decision Making/Keyboard Navigation

74) DON Corp. is contemplating the purchase of a machine that will produce net after-tax cash savings of $20,000 per year for 5 years. At the end of five years, the machine can be sold to realize after-tax cash flows of $5,000. Assuming a 12% discount rate, calculate the total present value of the cash inflows and the cash savings from the machine.

Answer: $74,933.

|  |  |
| --- | --- |
| PVA = $20,000 × 3.60478 (Table 4; n = 5; i = 12%) | $72,096 |
| PV = $5,000 × 0.56743 (Table 2; n = 5; i = 12%) | 2,837 |
| PV of Cash Savings | $74,933 |

Difficulty: 3 Hard

Topic: Present Value of a Single Amount; Present Value of an Annuity

Learning Objective: C-02 Calculate the future value and present value of a single amount.; C-03 Calculate the future value and present value of an annuity.

Bloom's: Analyze

AACSB: Analytical Thinking

AICPA/Accessibility: FN Measurement/Keyboard Navigation

75) Baird Bros. Construction is considering the purchase of a machine at a cost of $125,000. The machine is expected to generate cash flows of $20,000 per year for ten years and can be sold at the end of ten years for $10,000. The discount rate is 10%. Assume the machine would be paid for on the first day of year one, but that all other cash flows occur at the end of the year. Ignore income tax considerations. Determine if Baird should purchase the machine.

Answer: Baird Bros. Construction should buy the machine.

Present value of cash outflows $125,000

Present value of cash inflows:

Annual cash flows − $20,000 × 6.14457

(Table 4; n = 10; i = 10%) $122,891

Residual value − $10,000 × 0.38554

(Table 2; n = 10; i = 10%) 3,855 126,746

Positive present value of net cash flows $ 1,746

Difficulty: 3 Hard

Topic: Present Value of a Single Amount; Present Value of an Annuity

Learning Objective: C-02 Calculate the future value and present value of a single amount.; C-03 Calculate the future value and present value of an annuity.

Bloom's: Analyze

AACSB: Analytical Thinking

AICPA/Accessibility: FN Decision Making/Keyboard Navigation

76) Dobson Contractors is considering buying equipment at a cost of $75,000. The equipment is expected to generate cash flows of $15,000 per year for eight years and can be sold at the end of eight years for $5,000. The discount rate is 12%. Assume the equipment would be paid for on the first day of year one, but that all other cash flows occur at the end of the year. Ignore income tax considerations. Determine if Dobson should purchase the machine.

Answer: Dobson Construction should buy the machine.

Present value of cash outflows $75,000

Present value of cash inflows:

Annual cash flows − $15,000 × 4.96764 (Table 4; n = 8; i = 12%) $74,515

Residual value − $5,000 × 0.40388 (Table 2; n = 8; i = 12%) 2,019 76,534

Positive present value of net cash flows $ 1,534

Difficulty: 3 Hard

Topic: Present Value of a Single Amount; Present Value of an Annuity

Learning Objective: C-02 Calculate the future value and present value of a single amount.; C-03 Calculate the future value and present value of an annuity.

Bloom's: Analyze

AACSB: Analytical Thinking

AICPA/Accessibility: FN Decision Making; FN Measurement/Keyboard Navigation

77) Incognito Company is contemplating the purchase of a machine that provides it with net after-tax cash savings of $80,000 per year for 5 years. Assuming an 8% discount rate, calculate the present value of the cash savings.

Answer: $319,417.

PVA = $80,000 × 3.99271 (Table 4; n = 5; i =8%) = $319,417.

Difficulty: 3 Hard

Topic: Present Value of an Annuity

Learning Objective: C-03 Calculate the future value and present value of an annuity.

Bloom's: Analyze

AACSB: Analytical Thinking

AICPA/Accessibility: FN Measurement/Keyboard Navigation

78) Samson Inc. is contemplating the purchase of a machine that will provide it with net after-tax cash savings of $100,000 per year for 8 years. Assuming a 10% discount rate, calculate the present value of the cash savings.

Answer: $533,493.

PVA = $100,000 × 5.33493 (Table 4; n = 8; i = 10%) = $533,493.

Difficulty: 3 Hard

Topic: Present Value of an Annuity

Learning Objective: C-03 Calculate the future value and present value of an annuity.

Bloom's: Analyze

AACSB: Analytical Thinking

AICPA/Accessibility: FN Measurement/Keyboard Navigation

79) Briefly explain why the value of $100 received today is greater than the value of $100 received one year from now.

Answer: The following answer points out the key phrases that should appear in students' answers. It is not intended to be an example of complete student response. It might be helpful to provide detailed instructions to students on how brief or in depth you want their answers to be.

The $100 received today can be invested to receive interest. Simple interest is computed only on the initial investment amount. Compound interest includes not only interest on the initial investment, but also interest on the accumulated interest to date.

Difficulty: 2 Medium

Topic: Simple Versus Compound Interest

Learning Objective: C-01 Contrast simple and compound interest.

Bloom's: Understand

AACSB: Reflective Thinking

AICPA/Accessibility: BB Critical Thinking/Keyboard Navigation

80) Briefly describe the difference between simple interest and compound interest.

Answer: The following answer points out the key phrases that should appear in students' answers. It is not intended to be an example of complete student response. It might be helpful to provide detailed instructions to students on how brief or in depth you want their answers to be.

Simple interest is computed only on the initial investment amount. Compound interest includes not only interest on the initial investment, but also interest on the accumulated interest to date.

Difficulty: 2 Medium

Topic: Simple Versus Compound Interest

Learning Objective: C-01 Contrast simple and compound interest.

Bloom's: Understand

AACSB: Reflective Thinking

AICPA/Accessibility: BB Critical Thinking/Keyboard Navigation

81) Two banks each have stated CD rates of 12%. Bank A compounds quarterly and Bank B compounds semiannually. Explain which bank offers the better CD.

Answer: The following answer points out the key phrases that should appear in students' answers. It is not intended to be an example of complete student response. It might be helpful to provide detailed instructions to students on how brief or in depth you want their answers to be.

The yield on a CD increases with more frequent compounding periods. Therefore, since both CDs have the same stated rate of 12%, Bank A, that compounds quarterly, offers a better yield than Bank B with semiannual compounding.

Difficulty: 3 Hard

Topic: Simple Versus Compound Interest

Learning Objective: C-01 Contrast simple and compound interest.

Bloom's: Evaluate

AACSB: Analytical Thinking

AICPA/Accessibility: BB Critical Thinking/Keyboard Navigation

82) Explain the difference between present value and future value.

Answer: The following answer points out the key phrases that should appear in students' answers. It is not intended to be an example of complete student response. It might be helpful to provide detailed instructions to students on how brief or in depth you want their answers to be.

Present value tells us the value today of receiving some amount in the future. Future value is the value that an amount today will grow to in the future. The difference between the present value and the future value is the time value of money.

Difficulty: 2 Medium

Topic: Future Value of a Single Amount; Present Value of a Single Amount

Learning Objective: C-02 Calculate the future value and present value of a single amount.

Bloom's: Understand

AACSB: Reflective Thinking

AICPA/Accessibility: BB Critical Thinking/Keyboard Navigation

83) Which three factors are necessary in calculating the present value of a single amount?

Answer: The following answer points out the key phrases that should appear in students' answers. It is not intended to be an example of complete student response. It might be helpful to provide detailed instructions to students on how brief or in depth you want their answers to be.

You need to know (1) the future amount, (2) the interest rate per period, and (3) the number of periods.

Difficulty: 1 Easy

Topic: Present Value of a Single Amount

Learning Objective: C-02 Calculate the future value and present value of a single amount.

Bloom's: Remember

AACSB: Reflective Thinking

AICPA/Accessibility: BB Critical Thinking/Keyboard Navigation

84) What is the relationship between the present value of a single amount and the present value of an annuity?

Answer: The following answer points out the key phrases that should appear in students' answers. It is not intended to be an example of complete student response. It might be helpful to provide detailed instructions to students on how brief or in depth you want their answers to be.

The present value of a single amount is the value today of receiving that amount in the future; whereas, the present value of an annuity is the sum of the present values of a series of equal cash payments.

Difficulty: 2 Medium

Topic: Present Value of a Single Amount; Present Value of an Annuity

Learning Objective: C-02 Calculate the future value and present value of a single amount.; C-03 Calculate the future value and present value of an annuity.

Bloom's: Understand

AACSB: Reflective Thinking

AICPA/Accessibility: BB Critical Thinking/Keyboard Navigation