

**SULIT**



**KEMENTERIAN PENDIDIKAN TINGGI**  
**JABATAN PENDIDIKAN POLITEKNIK DAN KOLEJ KOMUNITI**

**BAHAGIAN PEPERIKSAAN DAN PENILAIAN**  
**JABATAN PENDIDIKAN POLITEKNIK DAN KOLEJ KOMUNITI**  
**KEMENTERIAN PENDIDIKAN TINGGI**

**JABATAN PERDAGANGAN**

**PEPERIKSAAN AKHIR**

**SESI I : 2024/2025**

**DPA40103 : FINANCIAL MANAGEMENT 2**

**TARIKH : 06 DISEMBER 2024**

**MASA : 3.00 PETANG - 5.00 PETANG (2 JAM)**

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Kertas ini mengandungi **SEMBILAN (9)** halaman bercetak.  
Subjektif (4 soalan)  
Dokumen sokongan yang disertakan : Formula dan Jadual Nilai Kini

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**JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIARAHKAN**

**(CLO yang tertera hanya sebagai rujukan)**

**SULIT**

**INSTRUCTION:**

This section consists of **FOUR (4)** questions. Answers **ALL** questions.

**ARAHAN:**

*Bahagian ini mengandungi **EMPAT (4)** soalan. Jawab **SEMUA** soalan.*

**QUESTION 1**

- CLO1 (a) List **FIVE (5)** types of Malaysian marketable securities. [5 marks]
- CLO1 (b) Explain **FOUR (4)** roles of Account Receivables in the working capital cycle. [10 marks]
- CLO1 (c) Teega Sdn. Bhd. sells 180,000 units of raw materials per year. Based on the company's policy, a safety stock of 2% from yearly sales is to be maintained. The carrying cost is RM0.60 per unit per year and the ordering costs are RM190. The delivery time is 8 days. Assume that Teega Sdn. Bhd. working time is 360 days per year.
- Calculate:
- i. Economic Order Quantity
  - ii. Reorder Point
- [10 marks]

**SOALAN 1**

- CLO1 (a) Nyatakan **LIMA (5)** jenis sekuriti boleh pasar Malaysia.  
[5 markah]
- CLO1 (b) Terangkan **EMPAT (4)** peranan Akaun Belum Terima dalam kitaran modal kerja.  
[10 markah]
- CLO1 (c) Teega Sdn. Bhd. menjual 180,000 unit bahan mentah setahun. Berdasarkan polisi syarikat, stok keselamatan ditetapkan sebanyak 2% daripada jualan tahunan. Kos bawaan adalah RM0.60 seunit setahun dan kos tempahan adalah RM190. Tempoh penghantaran adalah 8 hari. Andaikan bahawa waktu bekerja bagi Teega Sdn. Bhd. adalah 360 hari setahun.
- Kirakan:
- Kuantiti Pesanan Ekonomi
  - Tahap Pesanan Semula
- [10 markah]

**QUESTION 2**

- CLO1 (a) Describe **TWO (2)** advantages of short-term financing.  
[5 marks]
- CLO1 (b) Lestari Sdn. Bhd. wishes to have additional short-term funds of RM5,000,000. It has excellent relationships with its bank and its suppliers, and a highly respectable credit rating in general. The company maintains normal deposit balances of RM50,000. The company is evaluating the following alternatives:

|               |                                                                                                  |
|---------------|--------------------------------------------------------------------------------------------------|
| Alternative 1 | Lestari Sdn. Bhd. make a credit purchase on credit terms of 3/15 net 60.                         |
| Alternative 2 | 14% discounted interest loan from RHB Bank and 10% compensating balance is required by the bank. |

|               |                                                                                                                    |
|---------------|--------------------------------------------------------------------------------------------------------------------|
| Alternative 3 | Commercial paper bearing a 12% interest rate. The dealer will charge a placement fee of 2% from the amount issued. |
|---------------|--------------------------------------------------------------------------------------------------------------------|

Calculate the effective cost for each alternative. Which alternatives should be chosen by Lestari Sdn. Bhd..

[10 marks]

- CLO1 (c) Gomel Berhad has decided to expand its business and RM800,000 worth of external funds is needed. There are **TWO (2)** sources of financing available:
- Issue common shares at RM25. The company's growth rate is 8% and the most recent dividend paid was RM0.95 per share.
  - Issue preferred shares that pay 11.5% dividend on par value of RM100. Its current price is RM148.

Calculate the expected rate of return for both sources of financing.

[10 marks]

## SOALAN 2

- CLO1 (a) Huraikan **DUA (2)** kelebihan pembiayaan jangka pendek.

[5 markah]

- CLO1 (b) Lestari Sdn. Bhd. memerlukan tambahan dana jangka pendek sebanyak RM5,000,000. Syarikat ini mempunyai hubungan yang sangat baik dengan bank dan pembekalnya serta penarafan kredit yang sangat baik secara amnya. Syarikat biasanya mengekalkan baki deposit sebanyak RM50,000 dalam akaun mereka. Syarikat membuat penilaian berdasarkan alternatif berikut:

|                     |                                                                                                                                             |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Alternatif 1</i> | <i>Lestari Sdn. Bhd. membuat pembelian kredit dengan syarat kredit 3/15 bersih 60.</i>                                                      |
| <i>Alternatif 2</i> | <i>Pinjaman faedah diskaun 14% daripada RHB dan baki pampasan 10% diperlukan oleh bank.</i>                                                 |
| <i>Alternatif 3</i> | <i>Kertas perdagangan dengan kadar faedah 12%. Peniaga akan mengenakan bayaran penempatan sebanyak 2% daripada jumlah yang dikeluarkan.</i> |

*Kira kos efektif bagi setiap alternatif. Alternatif manakah yang harus digunakan oleh Lestari Sdn. Bhd..*

*[10 markah]*

CLO1 (b) *Gomel Berhad telah memutuskan untuk mengembangkan perniagaan dan memerlukan dana tambahan sebanyak RM800,000. Terdapat **DUA (2)** jenis sumber pembiayaan:*

- i. Menerbitkan saham biasa pada kadar RM25. Kadar pertumbuhan syarikat adalah 8% dan dividen terkini yang telah dibayar adalah RM0.95 sesaham.*
- ii. Menerbitkan saham keutamaan yang membayar dividen 11.5% pada nilai par RM100. Harga semasanya ialah RM148.*

*Kira kadar pulangan dijangka bagi kedua-dua sumber pembiayaan.*

*[10 markah]*

**QUESTION 3**

- CLO1 (a) Explain **FIVE (5)** steps of capital budgeting process.

[10 marks]

- CLO1 (b) Cucico Sdn Bhd is considering these two mutually exclusive projects which require an initial outlay of RM150,000. Below are the cash flows expected from each type of project. The required rate of return is 12%.

| Year | Project ND | Project MT |
|------|------------|------------|
| 1    | 40,000     | 45,000     |
| 2    | 40,000     | 48,000     |
| 3    | 40,000     | 50,000     |
| 4    | 40,000     | 55,000     |
| 5    | 40,000     | 60,000     |

For each type of project above, calculate:

- Payback period
- Net present value (NPV)

[10 marks]

- CLO1 (c) Based on your answer in (b), determine which project will be chosen and give the reasons.

[5 marks]

**SOALAN 3**

- CLO1 (a) Terangkan **LIMA (5)** langkah proses belanjawan modal.

[10 markah]

- CLO1 (b) Cucico Sdn Bhd sedang mempertimbangkan untuk melabur dalam dana dua projek yang berasingan melibatkan modal awal bernilai RM150,000. Berikut adalah anggaran aliran tunai dari kedua-dua projek. Kadar pulangan diperlukan adalah 12%.

| <i>Tahun</i> | <i>Project ND</i> | <i>Project MT</i> |
|--------------|-------------------|-------------------|
| <i>1</i>     | <i>40,000</i>     | <i>45,000</i>     |
| <i>2</i>     | <i>40,000</i>     | <i>48,000</i>     |
| <i>3</i>     | <i>40,000</i>     | <i>50,000</i>     |
| <i>4</i>     | <i>40,000</i>     | <i>55,000</i>     |
| <i>5</i>     | <i>40,000</i>     | <i>60,000</i>     |

Bagi setiap projek di atas, kirakan:

- i. Tempoh bayaran balik
- ii. Nilai kini bersih

[10 markah]

- CLO1 (c) Berdasarkan jawapan anda di (b), tentukan projek mana yang perlu dipilih dan berikan alasan.

[5 markah]

**QUESTION 4**

CLO1 (a) Define fixed cost and variable cost. [5 marks]

CLO1 (b) Leverage refers to the extent to which a company uses debt to support the company's resources and operations.

(i) Explain **THREE (3)** types of leverage. [6 marks]

(ii) Discuss business risk and financial risk. [4 marks]

CLO1 (c) A financial analyst has collected financial information of Tropika Bhd for the year ended 31 December 2022.

|                   |              |
|-------------------|--------------|
| Sales             | RM40,000,000 |
| Fixed cost        | RM4,000,000  |
| Variable cost     | RM18,500,000 |
| Interest expenses | RM2,700,000  |
| Company tax rate  | 28%          |

Based on the information given above, calculate:

- (i) Degree of Operating Leverage (DOL)
- (ii) Degree of Financial Leverage (DFL)
- (iii) Degree of Combine Leverage (DCL)

[10 marks]

**SOALAN 4**

CLO1 (a) Berikan definisi kos tetap dan kos berubah. [5 markah]

CLO1 (b) Leverage merujuk kepada sejauh mana syarikat menggunakan hutang untuk menampung sumber dan operasi syarikat.

(i) Terangkan **TIGA (3)** jenis leverage. [6 markah]

(ii) Bincangkan risiko perniagaan dan risiko kewangan. [4 markah]

CLO1 (c) Seorang penganalisis kewangan telah mengumpul maklumat kewangan bagi Tropika Bhd bagi tahun berakhir 31 Disember 2022.

|                      |              |
|----------------------|--------------|
| Jualan               | RM40,000,000 |
| Kos tetap            | RM4,000,000  |
| Kos berubah          | RM18,500,000 |
| Belanja faedah       | RM2,700,000  |
| Kadar cukai syarikat | 28%          |

Berdasarkan maklumat yang diberikan di atas, kira:

- (i) Darjah Leverage Operasi (DLO)
- (ii) Darjah Leverage Kewangan (DLK)
- (iii) Darjah Leverage Gabungan (DLG)

[10 markah]

**SOALAN TAMAT**

Present Value and Future Value Tables

Table A-1 Future Value Interest Factors for One Dollar Compounded at  $k$  Percent for  $n$  Periods:  $FVIF_{k,n} = (1 + k)^n$

| Period | 1%     | 2%     | 3%     | 4%     | 5%     | 6%     | 7%     | 8%     | 9%     | 10%     | 11%     | 12%     | 13%     | 14%     | 15%     | 16%     | 20%     | 24%     | 25%     | 30%     |
|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 1      | 1.0100 | 1.0200 | 1.0300 | 1.0400 | 1.0500 | 1.0600 | 1.0700 | 1.0800 | 1.0900 | 1.1000  | 1.1100  | 1.1200  | 1.1300  | 1.1400  | 1.1500  | 1.1600  | 1.2000  | 1.2400  | 1.2500  | 1.3000  |
| 2      | 1.0201 | 1.0404 | 1.0609 | 1.0816 | 1.1025 | 1.1236 | 1.1449 | 1.1664 | 1.1881 | 1.2100  | 1.2321  | 1.2544  | 1.2769  | 1.2996  | 1.3225  | 1.3456  | 1.4400  | 1.5376  | 1.5625  | 1.6900  |
| 3      | 1.0303 | 1.0612 | 1.0927 | 1.1249 | 1.1576 | 1.1910 | 1.2250 | 1.2597 | 1.2950 | 1.3310  | 1.3676  | 1.4049  | 1.4429  | 1.4815  | 1.5209  | 1.5609  | 1.7280  | 1.9066  | 1.9531  | 2.1970  |
| 4      | 1.0406 | 1.0824 | 1.1255 | 1.1699 | 1.2155 | 1.2625 | 1.3108 | 1.3605 | 1.4116 | 1.4641  | 1.5181  | 1.5735  | 1.6305  | 1.6890  | 1.7490  | 1.8106  | 2.0736  | 2.3642  | 2.4414  | 2.8561  |
| 5      | 1.0510 | 1.1041 | 1.1593 | 1.2167 | 1.2763 | 1.3382 | 1.4026 | 1.4693 | 1.5386 | 1.6105  | 1.6851  | 1.7623  | 1.8424  | 1.9254  | 2.0114  | 2.1003  | 2.4883  | 2.9316  | 3.0518  | 3.7129  |
| 6      | 1.0615 | 1.1262 | 1.1941 | 1.2653 | 1.3401 | 1.4185 | 1.5007 | 1.5869 | 1.6771 | 1.7716  | 1.8704  | 1.9738  | 2.0820  | 2.1950  | 2.3131  | 2.4364  | 2.9860  | 3.6352  | 3.8147  | 4.8268  |
| 7      | 1.0721 | 1.1487 | 1.2299 | 1.3159 | 1.4071 | 1.5036 | 1.6058 | 1.7138 | 1.8280 | 1.9487  | 2.0762  | 2.2107  | 2.3526  | 2.5023  | 2.6600  | 2.8262  | 3.5832  | 4.5077  | 4.7684  | 6.2749  |
| 8      | 1.0829 | 1.1717 | 1.2668 | 1.3686 | 1.4775 | 1.5938 | 1.7182 | 1.8509 | 1.9926 | 2.1436  | 2.3045  | 2.4760  | 2.6584  | 2.8526  | 3.0590  | 3.2784  | 4.2998  | 5.5895  | 5.9605  | 8.1573  |
| 9      | 1.0937 | 1.1951 | 1.3048 | 1.4233 | 1.5513 | 1.6895 | 1.8385 | 1.9990 | 2.1719 | 2.3579  | 2.5580  | 2.7731  | 3.0040  | 3.2519  | 3.5179  | 3.8030  | 5.1598  | 6.9310  | 7.4506  | 10.604  |
| 10     | 1.1046 | 1.2190 | 1.3439 | 1.4802 | 1.6289 | 1.7908 | 1.9672 | 2.1589 | 2.3674 | 2.5937  | 2.8394  | 3.1058  | 3.3946  | 3.7072  | 4.0456  | 4.4114  | 6.1917  | 8.5944  | 9.3132  | 13.786  |
| 11     | 1.1157 | 1.2434 | 1.3842 | 1.5395 | 1.7103 | 1.8983 | 2.1049 | 2.3316 | 2.5804 | 2.8531  | 3.1518  | 3.4785  | 3.8359  | 4.2262  | 4.6524  | 5.1173  | 7.4301  | 10.657  | 11.642  | 17.922  |
| 12     | 1.1268 | 1.2682 | 1.4258 | 1.6010 | 1.7959 | 2.0122 | 2.2522 | 2.5182 | 2.8127 | 3.1384  | 3.4985  | 3.8960  | 4.3345  | 4.8179  | 5.3503  | 5.9360  | 8.9161  | 13.215  | 14.552  | 23.298  |
| 13     | 1.1381 | 1.2936 | 1.4685 | 1.6651 | 1.8856 | 2.1329 | 2.4098 | 2.7196 | 3.0658 | 3.4523  | 3.8833  | 4.3635  | 4.8980  | 5.4924  | 6.1528  | 6.8858  | 10.699  | 16.386  | 18.190  | 30.288  |
| 14     | 1.1495 | 1.3195 | 1.5126 | 1.7317 | 1.9799 | 2.2609 | 2.5785 | 2.9372 | 3.3417 | 3.7975  | 4.3104  | 4.8871  | 5.5348  | 6.2613  | 7.0757  | 7.9875  | 12.839  | 20.319  | 22.737  | 39.374  |
| 15     | 1.1610 | 1.3459 | 1.5580 | 1.8009 | 2.0789 | 2.3966 | 2.7590 | 3.1722 | 3.6425 | 4.1772  | 4.7846  | 5.4736  | 6.2543  | 7.1379  | 8.1371  | 9.2655  | 15.407  | 25.196  | 28.422  | 51.186  |
| 16     | 1.1726 | 1.3728 | 1.6047 | 1.8730 | 2.1829 | 2.5404 | 2.9522 | 3.4259 | 3.9703 | 4.5950  | 5.3109  | 6.1304  | 7.0673  | 8.1372  | 9.3576  | 10.748  | 18.488  | 31.243  | 35.527  | 66.542  |
| 17     | 1.1843 | 1.4002 | 1.6528 | 1.9479 | 2.2920 | 2.6928 | 3.1588 | 3.7000 | 4.3276 | 5.0545  | 5.8951  | 6.8660  | 7.9861  | 9.2765  | 10.761  | 12.468  | 22.186  | 38.741  | 44.409  | 86.504  |
| 18     | 1.1961 | 1.4282 | 1.7024 | 2.0258 | 2.4066 | 2.8543 | 3.3799 | 3.9960 | 4.7171 | 5.5599  | 6.5436  | 7.6900  | 9.0243  | 10.575  | 12.375  | 14.463  | 26.623  | 48.039  | 55.511  | 112.455 |
| 19     | 1.2081 | 1.4568 | 1.7535 | 2.1068 | 2.5270 | 3.0256 | 3.6165 | 4.3157 | 5.1417 | 6.1159  | 7.2633  | 8.6128  | 10.197  | 12.056  | 14.232  | 16.777  | 31.948  | 59.568  | 69.389  | 146.192 |
| 20     | 1.2202 | 1.4859 | 1.8061 | 2.1911 | 2.6533 | 3.2071 | 3.8697 | 4.6610 | 5.6044 | 6.7275  | 8.0623  | 9.6463  | 11.523  | 13.743  | 16.367  | 19.461  | 38.338  | 73.864  | 86.736  | 190.050 |
| 21     | 1.2324 | 1.5157 | 1.8603 | 2.2788 | 2.7860 | 3.3996 | 4.1406 | 5.0338 | 6.0888 | 7.4002  | 8.9492  | 10.804  | 13.021  | 15.668  | 18.822  | 22.574  | 46.005  | 91.592  | 108.420 | 247.065 |
| 22     | 1.2447 | 1.5460 | 1.9161 | 2.3699 | 2.9253 | 3.6035 | 4.4304 | 5.4365 | 6.6586 | 8.1403  | 9.9336  | 12.100  | 14.714  | 17.861  | 21.645  | 26.186  | 55.206  | 113.574 | 135.525 | 321.184 |
| 23     | 1.2572 | 1.5769 | 1.9736 | 2.4647 | 3.0715 | 3.8197 | 4.7405 | 5.8715 | 7.2579 | 8.9543  | 11.026  | 13.552  | 16.627  | 20.362  | 24.891  | 30.376  | 66.247  | 140.831 | 169.407 | 417.539 |
| 24     | 1.2697 | 1.6084 | 2.0328 | 2.5633 | 3.2251 | 4.0489 | 5.0724 | 6.3412 | 7.9111 | 9.8497  | 12.239  | 15.179  | 18.788  | 23.212  | 28.625  | 35.236  | 79.497  | 174.631 | 211.758 | 542.801 |
| 25     | 1.2824 | 1.6406 | 2.0938 | 2.6658 | 3.3864 | 4.2919 | 5.4274 | 6.8485 | 8.6231 | 10.835  | 13.585  | 17.000  | 21.231  | 26.462  | 32.919  | 40.874  | 95.396  | 216.542 | 264.698 | 705.641 |
| 30     | 1.3478 | 1.8114 | 2.4273 | 3.2434 | 4.3219 | 5.7435 | 7.6123 | 10.063 | 13.268 | 17.449  | 22.892  | 29.960  | 39.116  | 50.950  | 66.212  | 85.850  | 237.376 | 634.820 | 807.794 | *       |
| 35     | 1.4166 | 1.9999 | 2.8139 | 3.9461 | 5.5160 | 7.6861 | 10.677 | 14.785 | 20.414 | 28.102  | 38.575  | 52.800  | 72.069  | 98.100  | 133.176 | 180.314 | 590.668 | *       | *       | *       |
| 36     | 1.4308 | 2.0399 | 2.8983 | 4.1039 | 5.7918 | 8.1473 | 11.424 | 15.968 | 22.251 | 30.913  | 42.818  | 59.136  | 81.437  | 111.834 | 153.152 | 209.164 | 708.802 | *       | *       | *       |
| 40     | 1.4889 | 2.2080 | 3.2620 | 4.8010 | 7.0400 | 10.286 | 14.974 | 21.725 | 31.409 | 45.259  | 65.001  | 93.051  | 132.782 | 188.884 | 267.864 | 378.721 | *       | *       | *       | *       |
| 50     | 1.6446 | 2.6916 | 4.3839 | 7.1067 | 11.467 | 18.420 | 29.457 | 46.902 | 74.358 | 117.391 | 184.565 | 289.002 | 450.736 | 700.233 | *       | *       | *       | *       | *       | *       |

Table A-2 Future Value Interest Factors for a One-Dollar Annuity Compounded at  $k$  Percent for  $n$  Periods:  $FVIFA_{k,n} = [(1 + k)^n - 1] / k$

| Period | 1%     | 2%     | 3%      | 4%      | 5%      | 6%      | 7%      | 8%      | 9%      | 10%     | 11%     | 12%     | 13%     | 14%     | 15%     | 16%     | 20%     | 24%     | 25%     | 30%     |
|--------|--------|--------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 1      | 1.0000 | 1.0200 | 1.0300  | 1.0400  | 1.0500  | 1.0600  | 1.0700  | 1.0800  | 1.0900  | 1.1000  | 1.1100  | 1.1200  | 1.1300  | 1.1400  | 1.1500  | 1.1600  | 1.2000  | 1.2400  | 1.2500  | 1.3000  |
| 2      | 2.0100 | 2.0200 | 2.0300  | 2.0400  | 2.0500  | 2.0600  | 2.0700  | 2.0800  | 2.0900  | 2.1000  | 2.1100  | 2.1200  | 2.1300  | 2.1400  | 2.1500  | 2.1600  | 2.2000  | 2.2400  | 2.2500  | 2.3000  |
| 3      | 3.0301 | 3.0604 | 3.0909  | 3.1216  | 3.1525  | 3.1836  | 3.2149  | 3.2464  | 3.2781  | 3.3100  | 3.3421  | 3.3744  | 3.4069  | 3.4396  | 3.4725  | 3.5056  | 3.6400  | 3.7776  | 3.8125  | 3.9900  |
| 4      | 4.0604 | 4.1216 | 4.1836  | 4.2465  | 4.3101  | 4.3746  | 4.4399  | 4.5061  | 4.5731  | 4.6410  | 4.7097  | 4.7793  | 4.8498  | 4.9211  | 4.9934  | 5.0665  | 5.3680  | 5.6842  | 5.7656  | 6.1870  |
| 5      | 5.1010 | 5.2040 | 5.3091  | 5.4163  | 5.5256  | 5.6371  | 5.7507  | 5.8666  | 5.9847  | 6.1051  | 6.2278  | 6.3528  | 6.4803  | 6.6101  | 6.7424  | 6.8771  | 7.4416  | 8.0484  | 8.2070  | 9.0431  |
| 6      | 6.1520 | 6.3081 | 6.4684  | 6.6330  | 6.8019  | 6.9753  | 7.1533  | 7.3359  | 7.5233  | 7.7156  | 7.9129  | 8.1152  | 8.3227  | 8.5355  | 8.7537  | 8.9775  | 9.9299  | 10.980  | 11.259  | 12.756  |
| 7      | 7.2135 | 7.4343 | 7.6625  | 7.8983  | 8.1420  | 8.3938  | 8.6540  | 8.9228  | 9.2004  | 9.4872  | 9.7833  | 10.089  | 10.405  | 10.730  | 11.067  | 11.414  | 12.916  | 14.615  | 15.073  | 17.583  |
| 8      | 8.2857 | 8.5830 | 8.8923  | 9.2142  | 9.5491  | 9.8975  | 10.260  | 10.637  | 11.028  | 11.436  | 11.859  | 12.300  | 12.757  | 13.233  | 13.727  | 14.240  | 16.499  | 19.123  | 19.842  | 23.858  |
| 9      | 9.3685 | 9.7546 | 10.159  | 10.583  | 11.027  | 11.491  | 11.978  | 12.488  | 13.021  | 13.579  | 14.164  | 14.776  | 15.416  | 16.085  | 16.786  | 17.519  | 20.799  | 24.712  | 25.802  | 32.015  |
| 10     | 10.462 | 10.950 | 11.464  | 12.006  | 12.578  | 13.181  | 13.816  | 14.487  | 15.193  | 15.937  | 16.722  | 17.549  | 18.420  | 19.337  | 20.304  | 21.321  | 25.959  | 31.643  | 33.253  | 42.619  |
| 11     | 11.567 | 12.169 | 12.808  | 13.486  | 14.207  | 14.972  | 15.784  | 16.645  | 17.560  | 18.531  | 19.561  | 20.655  | 21.814  | 23.045  | 24.349  | 25.733  | 32.150  | 40.238  | 42.566  | 56.405  |
| 12     | 12.683 | 13.412 | 14.192  | 15.026  | 15.917  | 16.870  | 17.888  | 18.977  | 20.141  | 21.384  | 22.713  | 24.133  | 25.650  | 27.271  | 29.002  | 30.850  | 39.581  | 50.895  | 54.208  | 74.327  |
| 13     | 13.809 | 14.680 | 15.618  | 16.627  | 17.713  | 18.882  | 20.141  | 21.495  | 22.953  | 24.523  | 26.212  | 28.029  | 29.985  | 32.089  | 34.352  | 36.786  | 48.497  | 64.110  | 68.760  | 97.625  |
| 14     | 14.947 | 15.974 | 17.086  | 18.292  | 19.599  | 21.015  | 22.550  | 24.215  | 26.019  | 27.975  | 30.095  | 32.393  | 34.883  | 37.581  | 40.505  | 43.672  | 59.196  | 80.496  | 86.949  | 127.913 |
| 15     | 16.097 | 17.293 | 18.599  | 20.024  | 21.579  | 23.276  | 25.129  | 27.152  | 29.361  | 31.772  | 34.405  | 37.280  | 40.417  | 43.842  | 47.580  | 51.660  | 72.035  | 100.815 | 109.687 | 167.286 |
| 16     | 17.258 | 18.639 | 20.157  | 21.825  | 23.657  | 25.673  | 27.888  | 30.324  | 33.003  | 35.950  | 39.190  | 42.753  | 46.672  | 50.980  | 55.717  | 60.925  | 87.442  | 126.011 | 138.109 | 218.472 |
| 17     | 18.430 | 20.012 | 21.762  | 23.698  | 25.840  | 28.213  | 30.840  | 33.750  | 36.974  | 40.545  | 44.501  | 48.884  | 53.739  | 59.118  | 65.075  | 71.673  | 105.931 | 157.253 | 173.636 | 285.014 |
| 18     | 19.615 | 21.412 | 23.414  | 25.645  | 28.132  | 30.906  | 33.999  | 37.450  | 41.301  | 45.599  | 50.396  | 55.750  | 61.725  | 68.394  | 75.836  | 84.141  | 128.117 | 195.994 | 218.045 | 371.518 |
| 19     | 20.811 | 22.841 | 25.117  | 27.671  | 30.539  | 33.760  | 37.379  | 41.446  | 46.018  | 51.159  | 56.939  | 63.440  | 70.749  | 78.969  | 88.212  | 98.603  | 154.740 | 244.033 | 273.556 | 483.973 |
| 20     | 22.019 | 24.297 | 26.870  | 29.778  | 33.066  | 36.786  | 40.995  | 45.762  | 51.160  | 57.275  | 64.203  | 72.052  | 80.947  | 91.025  | 102.444 | 115.380 | 186.688 | 303.601 | 342.945 | 630.165 |
| 21     | 23.239 | 25.783 | 28.676  | 31.969  | 35.719  | 39.993  | 44.865  | 50.423  | 56.765  | 64.002  | 72.265  | 81.699  | 92.470  | 104.768 | 118.810 | 134.841 | 225.026 | 377.465 | 429.681 | 820.215 |
| 22     | 24.472 | 27.299 | 30.537  | 34.248  | 38.505  | 43.392  | 49.006  | 55.457  | 62.873  | 71.403  | 81.214  | 92.503  | 105.491 | 120.436 | 137.632 | 157.415 | 271.031 | 469.056 | 538.101 | *       |
| 23     | 25.716 | 28.845 | 32.453  | 36.618  | 41.430  | 46.996  | 53.436  | 60.893  | 69.532  | 79.543  | 91.148  | 104.603 | 120.205 | 138.297 | 159.276 | 183.601 | 326.237 | 582.630 | 673.626 | *       |
| 24     | 26.973 | 30.422 | 34.426  | 39.083  | 44.502  | 50.816  | 58.177  | 66.765  | 76.790  | 88.497  | 102.174 | 118.155 | 136.831 | 158.659 | 184.168 | 213.978 | 392.484 | 723.461 | 843.033 | *       |
| 25     | 28.243 | 32.030 | 36.459  | 41.646  | 47.727  | 54.865  | 63.249  | 73.106  | 84.701  | 98.347  | 114.413 | 133.334 | 155.620 | 181.871 | 212.793 | 249.214 | 471.981 | 898.092 | *       | *       |
| 30     | 34.785 | 40.568 | 47.575  | 56.085  | 66.439  | 79.058  | 94.461  | 113.283 | 136.308 | 164.994 | 199.021 | 241.333 | 293.199 | 356.787 | 434.745 | 530.312 | *       | *       | *       | *       |
| 35     | 41.660 | 49.994 | 60.462  | 73.652  | 90.320  | 111.435 | 138.237 | 172.317 | 215.711 | 271.024 | 341.590 | 431.663 | 546.681 | 693.573 | 881.170 | *       | *       | *       | *       | *       |
| 36     | 43.077 | 51.994 | 63.276  | 77.598  | 95.836  | 119.121 | 148.913 | 187.102 | 236.125 | 299.127 | 380.164 | 484.463 | 618.749 | 791.673 | *       | *       | *       | *       | *       | *       |
| 40     | 48.866 | 60.402 | 75.401  | 95.026  | 120.800 | 154.762 | 199.635 | 259.057 | 337.882 | 442.592 | 581.826 | 767.091 | *       | *       | *       | *       | *       | *       | *       | *       |
| 50     | 64.463 | 84.579 | 112.797 | 152.667 | 209.348 | 290.336 | 406.529 | 573.770 | 815.084 | *       | *       | *       | *       | *       | *       | *       | *       | *       | *       | *       |

**Present Value and Future Value Tables**

**Table A-3 Present Value Interest Factors for One Dollar Discounted at  $k$  Percent for  $n$  Periods:  $PVIF_{k,n} = 1 / (1 + k)^n$**

| Period | 1%     | 2%     | 3%     | 4%     | 5%     | 6%     | 7%     | 8%     | 9%     | 10%    | 11%    | 12%    | 13%    | 14%    | 15%    | 16%    | 20%    | 24%    | 25%    | 30%    |
|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 1      | 0.9901 | 0.9804 | 0.9709 | 0.9615 | 0.9524 | 0.9434 | 0.9346 | 0.9259 | 0.9174 | 0.9091 | 0.9009 | 0.8929 | 0.8850 | 0.8772 | 0.8696 | 0.8621 | 0.8333 | 0.8065 | 0.8000 | 0.7692 |
| 2      | 0.9803 | 0.9612 | 0.9426 | 0.9246 | 0.9070 | 0.8900 | 0.8734 | 0.8573 | 0.8417 | 0.8264 | 0.8116 | 0.7972 | 0.7831 | 0.7695 | 0.7561 | 0.7432 | 0.6944 | 0.6504 | 0.6400 | 0.5917 |
| 3      | 0.9706 | 0.9423 | 0.9151 | 0.8890 | 0.8638 | 0.8396 | 0.8163 | 0.7938 | 0.7722 | 0.7513 | 0.7312 | 0.7118 | 0.6931 | 0.6750 | 0.6575 | 0.6407 | 0.5787 | 0.5245 | 0.5120 | 0.4552 |
| 4      | 0.9610 | 0.9238 | 0.8885 | 0.8548 | 0.8227 | 0.7921 | 0.7629 | 0.7350 | 0.7084 | 0.6830 | 0.6587 | 0.6355 | 0.6133 | 0.5921 | 0.5718 | 0.5523 | 0.4823 | 0.4230 | 0.4096 | 0.3501 |
| 5      | 0.9515 | 0.9057 | 0.8626 | 0.8219 | 0.7835 | 0.7473 | 0.7130 | 0.6806 | 0.6499 | 0.6209 | 0.5935 | 0.5674 | 0.5428 | 0.5194 | 0.4972 | 0.4761 | 0.4019 | 0.3411 | 0.3277 | 0.2693 |
| 6      | 0.9420 | 0.8880 | 0.8375 | 0.7903 | 0.7462 | 0.7050 | 0.6663 | 0.6302 | 0.5963 | 0.5645 | 0.5346 | 0.5066 | 0.4803 | 0.4556 | 0.4323 | 0.4104 | 0.3349 | 0.2751 | 0.2621 | 0.2072 |
| 7      | 0.9327 | 0.8706 | 0.8131 | 0.7599 | 0.7107 | 0.6651 | 0.6227 | 0.5835 | 0.5470 | 0.5132 | 0.4817 | 0.4523 | 0.4251 | 0.3996 | 0.3759 | 0.3538 | 0.2791 | 0.2218 | 0.2097 | 0.1594 |
| 8      | 0.9235 | 0.8535 | 0.7894 | 0.7307 | 0.6768 | 0.6274 | 0.5820 | 0.5403 | 0.5019 | 0.4665 | 0.4339 | 0.4039 | 0.3762 | 0.3506 | 0.3269 | 0.3050 | 0.2326 | 0.1789 | 0.1678 | 0.1226 |
| 9      | 0.9143 | 0.8368 | 0.7664 | 0.7026 | 0.6446 | 0.5919 | 0.5439 | 0.5002 | 0.4604 | 0.4241 | 0.3909 | 0.3606 | 0.3329 | 0.3075 | 0.2843 | 0.2630 | 0.1938 | 0.1443 | 0.1342 | 0.0943 |
| 10     | 0.9053 | 0.8203 | 0.7441 | 0.6756 | 0.6139 | 0.5584 | 0.5083 | 0.4632 | 0.4224 | 0.3855 | 0.3522 | 0.3220 | 0.2946 | 0.2697 | 0.2472 | 0.2267 | 0.1615 | 0.1164 | 0.1074 | 0.0725 |
| 11     | 0.8963 | 0.8043 | 0.7224 | 0.6496 | 0.5847 | 0.5268 | 0.4751 | 0.4289 | 0.3875 | 0.3505 | 0.3173 | 0.2875 | 0.2607 | 0.2366 | 0.2149 | 0.1954 | 0.1346 | 0.0938 | 0.0859 | 0.0558 |
| 12     | 0.8874 | 0.7885 | 0.7014 | 0.6246 | 0.5568 | 0.4970 | 0.4440 | 0.3971 | 0.3555 | 0.3186 | 0.2858 | 0.2567 | 0.2307 | 0.2076 | 0.1869 | 0.1685 | 0.1122 | 0.0757 | 0.0687 | 0.0429 |
| 13     | 0.8787 | 0.7730 | 0.6810 | 0.6006 | 0.5303 | 0.4688 | 0.4150 | 0.3677 | 0.3262 | 0.2897 | 0.2575 | 0.2292 | 0.2042 | 0.1821 | 0.1625 | 0.1452 | 0.0935 | 0.0610 | 0.0550 | 0.0330 |
| 14     | 0.8700 | 0.7579 | 0.6611 | 0.5775 | 0.5051 | 0.4423 | 0.3878 | 0.3405 | 0.2992 | 0.2633 | 0.2320 | 0.2046 | 0.1807 | 0.1597 | 0.1413 | 0.1252 | 0.0779 | 0.0492 | 0.0440 | 0.0254 |
| 15     | 0.8613 | 0.7430 | 0.6419 | 0.5553 | 0.4810 | 0.4173 | 0.3624 | 0.3152 | 0.2745 | 0.2394 | 0.2090 | 0.1827 | 0.1599 | 0.1401 | 0.1229 | 0.1079 | 0.0649 | 0.0397 | 0.0352 | 0.0195 |
| 16     | 0.8528 | 0.7284 | 0.6232 | 0.5339 | 0.4581 | 0.3936 | 0.3387 | 0.2919 | 0.2519 | 0.2176 | 0.1883 | 0.1631 | 0.1415 | 0.1229 | 0.1069 | 0.0930 | 0.0541 | 0.0320 | 0.0281 | 0.0150 |
| 17     | 0.8444 | 0.7142 | 0.6050 | 0.5134 | 0.4363 | 0.3714 | 0.3166 | 0.2703 | 0.2311 | 0.1978 | 0.1696 | 0.1456 | 0.1252 | 0.1078 | 0.0929 | 0.0802 | 0.0451 | 0.0258 | 0.0225 | 0.0116 |
| 18     | 0.8360 | 0.7002 | 0.5874 | 0.4936 | 0.4155 | 0.3503 | 0.2959 | 0.2502 | 0.2120 | 0.1799 | 0.1528 | 0.1300 | 0.1108 | 0.0946 | 0.0808 | 0.0691 | 0.0376 | 0.0208 | 0.0180 | 0.0089 |
| 19     | 0.8277 | 0.6864 | 0.5703 | 0.4746 | 0.3957 | 0.3305 | 0.2765 | 0.2317 | 0.1945 | 0.1635 | 0.1377 | 0.1161 | 0.0981 | 0.0829 | 0.0703 | 0.0596 | 0.0313 | 0.0168 | 0.0144 | 0.0068 |
| 20     | 0.8195 | 0.6730 | 0.5537 | 0.4564 | 0.3769 | 0.3118 | 0.2584 | 0.2145 | 0.1784 | 0.1486 | 0.1240 | 0.1037 | 0.0868 | 0.0728 | 0.0611 | 0.0514 | 0.0261 | 0.0135 | 0.0115 | 0.0053 |
| 21     | 0.8114 | 0.6598 | 0.5375 | 0.4388 | 0.3589 | 0.2942 | 0.2415 | 0.1987 | 0.1637 | 0.1351 | 0.1117 | 0.0926 | 0.0768 | 0.0638 | 0.0531 | 0.0443 | 0.0217 | 0.0109 | 0.0092 | 0.0040 |
| 22     | 0.8034 | 0.6468 | 0.5219 | 0.4220 | 0.3418 | 0.2775 | 0.2257 | 0.1839 | 0.1502 | 0.1228 | 0.1007 | 0.0826 | 0.0680 | 0.0560 | 0.0462 | 0.0382 | 0.0181 | 0.0088 | 0.0074 | 0.0031 |
| 23     | 0.7954 | 0.6342 | 0.5067 | 0.4057 | 0.3256 | 0.2618 | 0.2109 | 0.1703 | 0.1378 | 0.1117 | 0.0907 | 0.0738 | 0.0601 | 0.0491 | 0.0402 | 0.0329 | 0.0151 | 0.0071 | 0.0059 | 0.0024 |
| 24     | 0.7876 | 0.6217 | 0.4919 | 0.3901 | 0.3101 | 0.2470 | 0.1971 | 0.1577 | 0.1264 | 0.1015 | 0.0817 | 0.0659 | 0.0532 | 0.0431 | 0.0349 | 0.0284 | 0.0126 | 0.0057 | 0.0047 | 0.0018 |
| 25     | 0.7798 | 0.6095 | 0.4776 | 0.3751 | 0.2953 | 0.2330 | 0.1842 | 0.1460 | 0.1160 | 0.0923 | 0.0736 | 0.0588 | 0.0471 | 0.0378 | 0.0304 | 0.0245 | 0.0105 | 0.0046 | 0.0038 | 0.0014 |
| 30     | 0.7419 | 0.5521 | 0.4120 | 0.3083 | 0.2314 | 0.1741 | 0.1314 | 0.0994 | 0.0754 | 0.0573 | 0.0437 | 0.0334 | 0.0256 | 0.0196 | 0.0151 | 0.0116 | 0.0042 | 0.0016 | 0.0012 | *      |
| 35     | 0.7059 | 0.5000 | 0.3554 | 0.2534 | 0.1813 | 0.1301 | 0.0937 | 0.0676 | 0.0490 | 0.0356 | 0.0259 | 0.0189 | 0.0139 | 0.0102 | 0.0075 | 0.0055 | 0.0017 | 0.0005 | *      | *      |
| 40     | 0.6717 | 0.4529 | 0.3066 | 0.2083 | 0.1420 | 0.0972 | 0.0668 | 0.0460 | 0.0318 | 0.0221 | 0.0154 | 0.0107 | 0.0075 | 0.0053 | 0.0037 | 0.0026 | 0.0007 | *      | *      | *      |
| 50     | 0.6080 | 0.3715 | 0.2281 | 0.1407 | 0.0872 | 0.0543 | 0.0339 | 0.0213 | 0.0134 | 0.0085 | 0.0054 | 0.0035 | 0.0022 | 0.0014 | 0.0009 | 0.0006 | *      | *      | *      | *      |

**Table A-4 Present Value Interest Factors for a One-Dollar Annuity Discounted at  $k$  Percent for  $n$  Periods:  $PVIFA = [1 - 1/(1 + k)^n] / k$**

| Period | 1%     | 2%     | 3%     | 4%     | 5%     | 6%     | 7%     | 8%     | 9%     | 10%    | 11%    | 12%    | 13%    | 14%    | 15%    | 16%    | 20%    | 24%    | 25%    | 30%    |
|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 1      | 0.9901 | 0.9804 | 0.9709 | 0.9615 | 0.9524 | 0.9434 | 0.9346 | 0.9259 | 0.9174 | 0.9091 | 0.9009 | 0.8929 | 0.8850 | 0.8772 | 0.8696 | 0.8621 | 0.8333 | 0.8065 | 0.8000 | 0.7692 |
| 2      | 1.9704 | 1.9416 | 1.9135 | 1.8861 | 1.8594 | 1.8334 | 1.8080 | 1.7833 | 1.7591 | 1.7355 | 1.7125 | 1.6901 | 1.6681 | 1.6467 | 1.6257 | 1.6052 | 1.5278 | 1.4568 | 1.4400 | 1.3609 |
| 3      | 2.9410 | 2.8839 | 2.8286 | 2.7751 | 2.7232 | 2.6730 | 2.6243 | 2.5771 | 2.5313 | 2.4869 | 2.4437 | 2.4018 | 2.3612 | 2.3216 | 2.2832 | 2.2459 | 2.1065 | 1.9813 | 1.9520 | 1.8161 |
| 4      | 3.9020 | 3.8077 | 3.7171 | 3.6299 | 3.5460 | 3.4651 | 3.3872 | 3.3121 | 3.2397 | 3.1699 | 3.1024 | 3.0373 | 2.9745 | 2.9137 | 2.8550 | 2.7982 | 2.5887 | 2.4043 | 2.3616 | 2.1662 |
| 5      | 4.8534 | 4.7135 | 4.5797 | 4.4518 | 4.3295 | 4.2124 | 4.1002 | 3.9927 | 3.8897 | 3.7908 | 3.6959 | 3.6048 | 3.5172 | 3.4331 | 3.3522 | 3.2743 | 2.9906 | 2.7454 | 2.6893 | 2.4356 |
| 6      | 5.7955 | 5.6014 | 5.4172 | 5.2421 | 5.0757 | 4.9173 | 4.7665 | 4.6229 | 4.4859 | 4.3553 | 4.2305 | 4.1114 | 3.9975 | 3.8887 | 3.7845 | 3.6847 | 3.3255 | 3.0205 | 2.9514 | 2.6427 |
| 7      | 6.7282 | 6.4720 | 6.2303 | 6.0021 | 5.7864 | 5.5824 | 5.3893 | 5.2064 | 5.0330 | 4.8684 | 4.7122 | 4.5638 | 4.4226 | 4.2883 | 4.1604 | 4.0386 | 3.6046 | 3.2423 | 3.1611 | 2.8021 |
| 8      | 7.6517 | 7.3255 | 7.0197 | 6.7327 | 6.4632 | 6.2098 | 5.9713 | 5.7466 | 5.5348 | 5.3349 | 5.1461 | 4.9676 | 4.7988 | 4.6389 | 4.4873 | 4.3436 | 3.8372 | 3.4212 | 3.3289 | 2.9247 |
| 9      | 8.5660 | 8.1622 | 7.7861 | 7.4353 | 7.1078 | 6.8017 | 6.5152 | 6.2469 | 5.9952 | 5.7590 | 5.5370 | 5.3282 | 5.1317 | 4.9464 | 4.7716 | 4.6065 | 4.0310 | 3.5655 | 3.4631 | 3.0190 |
| 10     | 9.4713 | 8.9826 | 8.5302 | 8.1109 | 7.7217 | 7.3601 | 7.0236 | 6.7101 | 6.4177 | 6.1446 | 5.8892 | 5.6502 | 5.4262 | 5.2161 | 5.0188 | 4.8332 | 4.1925 | 3.6819 | 3.5705 | 3.0915 |
| 11     | 10.368 | 9.7868 | 9.2526 | 8.7605 | 8.3064 | 7.8869 | 7.4987 | 7.1390 | 6.8052 | 6.4951 | 6.2065 | 5.9377 | 5.6869 | 5.4527 | 5.2337 | 5.0286 | 4.3271 | 3.7757 | 3.6564 | 3.1473 |
| 12     | 11.255 | 10.575 | 9.9540 | 9.3851 | 8.8633 | 8.3838 | 7.9427 | 7.5361 | 7.1607 | 6.8137 | 6.4924 | 6.1944 | 5.9176 | 5.6603 | 5.4206 | 5.1971 | 4.4392 | 3.8514 | 3.7251 | 3.1903 |
| 13     | 12.134 | 11.348 | 10.635 | 9.9856 | 9.3936 | 8.8527 | 8.3577 | 7.9038 | 7.4869 | 7.1034 | 6.7499 | 6.4235 | 6.1218 | 5.8424 | 5.5831 | 5.3423 | 4.5327 | 3.9124 | 3.7801 | 3.2233 |
| 14     | 13.004 | 12.106 | 11.296 | 10.563 | 9.8986 | 9.2950 | 8.7455 | 8.2442 | 7.7862 | 7.3667 | 6.9819 | 6.6282 | 6.3025 | 6.0021 | 5.7245 | 5.4675 | 4.6106 | 3.9616 | 3.8241 | 3.2487 |
| 15     | 13.865 | 12.849 | 11.938 | 11.118 | 10.380 | 9.7122 | 9.1079 | 8.5595 | 8.0607 | 7.6061 | 7.1909 | 6.8109 | 6.4624 | 6.1422 | 5.8474 | 5.5755 | 4.6755 | 4.0013 | 3.8593 | 3.2682 |
| 16     | 14.718 | 13.578 | 12.561 | 11.652 | 10.838 | 10.106 | 9.4466 | 8.8514 | 8.3126 | 7.8237 | 7.3792 | 6.9740 | 6.6039 | 6.2651 | 5.9542 | 5.6685 | 4.7296 | 4.0333 | 3.8874 | 3.2832 |
| 17     | 15.562 | 14.292 | 13.166 | 12.166 | 11.274 | 10.477 | 9.7632 | 9.1216 | 8.5436 | 8.0216 | 7.5488 | 7.1196 | 6.7291 | 6.3729 | 6.0472 | 5.7487 | 4.7746 | 4.0591 | 3.9099 | 3.2948 |
| 18     | 16.398 | 14.992 | 13.754 | 12.659 | 11.690 | 10.828 | 10.059 | 9.3719 | 8.7556 | 8.2014 | 7.7016 | 7.2497 | 6.8399 | 6.4674 | 6.1280 | 5.8178 | 4.8122 | 4.0799 | 3.9279 | 3.3037 |
| 19     | 17.226 | 15.678 | 14.324 | 13.134 | 12.085 | 11.158 | 10.336 | 9.6036 | 8.9501 | 8.3649 | 7.8393 | 7.3658 | 6.9380 | 6.5504 | 6.1982 | 5.8775 | 4.8435 | 4.0967 | 3.9424 | 3.3105 |
| 20     | 18.046 | 16.351 | 14.877 | 13.590 | 12.462 | 11.470 | 10.594 | 9.8181 | 9.1285 | 8.5136 | 7.9633 | 7.4694 | 7.0248 | 6.6231 | 6.2593 | 5.9288 | 4.8696 | 4.1103 | 3.9539 | 3.3158 |
| 21     | 18.857 | 17.011 | 15.415 | 14.029 | 12.821 | 11.764 | 10.836 | 10.017 | 9.2922 | 8.6487 | 8.0751 | 7.5620 | 7.1016 | 6.6870 | 6.3125 | 5.9731 | 4.8913 | 4.1212 | 3.9631 | 3.3198 |
| 22     | 19.660 | 17.658 | 15.937 | 14.451 | 13.163 | 12.042 | 11.061 | 10.201 | 9.4424 | 8.7715 | 8.1757 | 7.6446 | 7.1695 | 6.7429 | 6.3587 | 6.0113 | 4.9094 | 4.1300 | 3.9705 | 3.3230 |
| 23     | 20.456 | 18.292 | 16.444 | 14.857 | 13.489 | 12.303 | 11.272 | 10.371 | 9.5802 | 8.8832 | 8.2664 | 7.7184 | 7.2297 | 6.7921 | 6.3988 | 6.0442 | 4.9245 | 4.1371 | 3.9764 | 3.3254 |
| 24     | 21.243 | 18.914 | 16.936 | 15.247 | 13.799 | 12.550 | 11.469 | 10.529 | 9.7066 | 8.9847 | 8.3481 | 7.7843 | 7.2829 | 6.8351 | 6.4338 | 6.0726 | 4.9371 | 4.1428 | 3.9811 | 3.3272 |
| 25     | 22.023 | 19.523 | 17.413 | 15.622 | 14.094 | 12.783 | 11.654 | 10.675 | 9.8226 | 9.0770 | 8.4217 | 7.8431 | 7.3300 | 6.8729 | 6.4641 | 6.0971 | 4.9476 | 4.1474 | 3.9849 | 3.3286 |
| 30     | 25.808 | 22.396 | 19.600 | 17.292 | 15.372 | 13.765 | 12.409 | 11.258 | 10.274 | 9.4269 | 8.6938 | 8.0552 | 7.4957 | 7.0027 | 6.5660 | 6.1772 | 4.9789 | 4.1601 | 3.9950 | 3.3321 |
| 35     | 29.409 | 24.999 | 21.487 | 18.865 | 16.374 | 14.498 | 12.948 | 11.655 | 10.567 | 9.6442 | 8.8552 | 8.1755 | 7.5856 | 7.0700 | 6.6166 | 6.2153 | 4.9915 | 4.1644 | 3.9984 | 3.3330 |
| 40     | 32.835 | 27.355 | 23.115 | 19.793 | 17.159 | 15.046 | 13.332 | 11.925 | 10.757 | 9.7791 | 8.9511 | 8.2438 | 7.6344 | 7.1050 | 6.6418 | 6.2335 | 4.9966 | 4.1659 | 3.9995 | 3.3332 |
| 50     | 39.196 | 31.424 | 25.730 | 21.482 | 18.256 | 15.762 | 13.801 | 12.233 | 10.962 | 9.9148 | 9.0417 | 8.3045 | 7.6752 | 7.1327 | 6.6605 | 6.2463 | 4.9995 | 4.1666 | 3.9999 | 3.3333 |

## FORMULA

Operating Cycle = Average age of inventory (AAI) + Average collection period (ACP)

$$\text{Total carrying cost (TCC)} = (\text{inventory average}) (\text{carrying cost per unit}) \\ = (Q/2) C$$

$$\text{Total ordering cost (TOC)} = (\text{times order is made}) (\text{each order cost}) \\ = (S/Q) O$$

$$\text{Total inventory cost (TIC)} = \text{TCC} + \text{TOC} \\ = (Q/2) C + (S/Q) O$$

$$\text{EOQ} = \sqrt{\frac{2(S)O}{C}}$$

$$\text{Inventory average} = (\text{EOQ} / 2) + \text{safety stock}$$

$$\text{Number of annual order} = \text{annual requirement} / \text{each order quantity (EOQ)}$$

$$\text{Total inventory cost} = \text{Total Carrying Cost (TCC)} + \text{Total Ordering Cost (TOC)} \\ = ((Q/2) + \text{safety stock}) C + (S/Q) O$$

$$\text{Surrendered discount annual cost} = \frac{a}{1-a} \times \frac{360}{c-b}$$

(Credit effective cost)

$$\text{Interest} = \text{Principal (P)} \times \text{Rate (R)} \times \text{Time (T)}$$

$$\text{Annual effective rate} = \frac{\text{Interest}}{\text{Principal}} \times \frac{1}{\text{Time}}$$

$$\text{Annual effective rate (Discounted)} = \frac{\text{Interest}}{\text{Principal} - \text{Interest}} \times \frac{1}{\text{Time}}$$

$$\text{Effective cost of Interest} = \frac{(\text{Interest} + \text{Fees})}{(\text{Principal} - \text{Interest} - \text{Fees})} \times \frac{1}{\text{Time}}$$

$$V_b = I (\text{PVIFA } i, n) + M (\text{PVIF } i, n)$$

$$V_b = I (\text{PVIFA } i/m, mn) + M (\text{PVIF } i/m, mn)$$

$$V_{ps} = \frac{D}{R_{ps}}, \quad R_{ps} = \frac{D}{V_{ps}}, \quad V_{cs} = \frac{D}{1 + R_{cs}} + \frac{P}{1 + R_{cs}}, \quad V_{cs} = \frac{D}{R_{cs}}, \quad V_{cs} = \frac{D}{R_{cs} - g}, \quad D_1 = D_0 (1+g)$$

$$\text{Annual Depreciation} = \frac{\text{Cost of depreciable assets} - \text{Scrap Value}}{\text{Asset life}}$$

$$PP = \text{Initial outlay} / \text{ACF average}$$

$$NPV = (\text{ACF}_t \times \text{PVIFA } k, n) - IO$$

$$\text{IRR} = \frac{ACF_t}{\sum (1 + \text{IRR})^t}$$

$$PI = \frac{\sum \frac{ACF_t}{(1+k)^t}}{IO}$$

$$(P \times Q) - [(V \times Q) + F] = \text{EBIT} = 0$$

$$\text{BEP (unit)}, \quad Q = \frac{F}{P - V}, \quad \text{BEP (\$)} = \text{BEP (unit)} \times \text{sales price}$$

$$\text{BEP (\$)}, \quad *S = \frac{F}{1 - \frac{V}{S}}, \quad \text{BEP (unit)} = \text{BEP (\$)} / \text{Sales price per unit}$$

$$\text{DOL (S)} = (S - VQ) / (S - VQ - F)$$

$$\text{DFL (S)} = (S - VQ - FC) / (S - VQ - FC - I - [PD \times 1 / (1 - T)])$$

$$\text{DCL} = \text{DOL} \times \text{DFL}$$

$$\text{DCL (S)} = (S - VQ) / (S - VQ - FC - I - [PD / (1 - T)])$$