

Corporate Finance
Subject Code: DM 303
Trimester – III, End-Term Examination, March 2018
PGDM, Batch 2017-19

Time allowed: 2 1/2 Hours
50

Max Marks:

Roll No: _____

Instruction: Students are required to write Roll No on every page of the question paper, writing anything except the Roll No will be treated as **Unfair Means**. In case of rough work please use answer sheet.

| Sections | No. of Questions to attempt | Marks | Marks |
|----------|------------------------------|--------------------|-----------|
| A | 3 out of 5 (Short Questions) | 5 Marks each | 3*5 = 15 |
| B | 2 out of 3 (Long Questions) | 10 Marks each | 2*10 = 20 |
| C | Compulsory Case Study | 15 Marks | 15 |
| | | Total Marks | 50 |

Section A

A-1) A company is studying a half-dozen capital improvement projects. It has allocated Rs 1 million for capital budgeting process. The following proposals and associated profitability indexes have been determined. The project themselves are independent of one another

| Project | Amount (Rs) | Profitability Index |
|---------|-------------|---------------------|
| 1 | 5,00,000 | 1.21 |
| 2 | 1,50,000 | 0.95 |
| 3 | 3,50,000 | 1.20 |
| 4 | 4,50,000 | 1.18 |
| 5 | 2,00,000 | 1.20 |
| 6 | 4,00,000 | 1.05 |

With strict capital rationing, which of these investments should be undertaken?

A-2) An investor purchased a share for Rs 100 and after four years she sold this share for Rs 150 after four years. With no dividend paid by the stock her returns were 50% over a period of four years. She therefore concluded that her annual returns were 12.5%. Is she right in her conclusion? Explain

A-3) You are offered an annuity that will pay Rs. 17,000 per year for 7 years (the first payment will be made today). If you feel that the appropriate discount rate is 11%, what is the annuity worth to you today?

A-4) High Dividend Yields Represent a Good Investment ... Or Do They?

A-5) Explain CAPM approach to valuation of equity shares?

Section B

B-1) A chemical company is considering replacing an existing machine with one costing Rs. 65,000. The existing machine was originally purchased two years ago for Rs. 28,000 and is being depreciated by the straight line method over its seven-year life period. It can currently be sold for Rs.30,000 with no removal costs. The new machine would cost Rs.10,000 to install and would be depreciate over five years. The management believes that the new machine would have a salvage value of Rs.5,000 at the end of year five . The management also estimates an increase in net working capital requirement of Rs.10,000 as a result of expanded operations with the new machine. The firm is taxed at a rate of 55% on normal income and 30% on capital gains. The company's expected after-tax profits for next 5 years with existing machine and with new machine are given as follows:

| Year | Expected after-tax profits | |
|------|-----------------------------|------------------------|
| | With existing machine (Rs.) | With new machine (Rs.) |
| 1 | 2,00,000 | 2,16,000 |
| 2 | 1,50,000 | 1,50,000 |
| 3 | 1,80,000 | 2,00,000 |
| 4 | 2,10,000 | 2,40,000 |
| 5 | 2,20,000 | 2,30,000 |

- (i) Calculate the net investment required by the new machine.
- (ii) If the company's cost of capital is 15%, determine whether the new machine should be purchased.

B-2) A firm has sales of Rs. 10 lacs and fixed cost of Rs. 1.5 lacs. Contribution margin is 30%. It has 10% debt of Rs. 8 lacs. Find out Operating leverage, Financial leverage and Combined leverage. Also find out that if the firm wants to double the EBIT, how much percent increase in sales is needed?

B-3) Assuming that the firm pays tax at 40%, compute the Weighted Average Cost of Capital from the following:

| | | |
|-------------------------------------|-----------|--|
| 5,000 Equity shares of Rs. 100 each | 5, 00,000 | |
| 10% Preference Shares | 1,00,000 | |
| 12% Debentures | 4,00,000 | |

The current market price of the share is Rs120. The Company is expected to declare a dividend of Rs 12 at the end of the current year, with an expected growth rate of 8 %. Use book value weights.

Section C

Estimate the Net Working Capital requirement for Vertical Ltd. from the following information.

| | Per Unit |
|--------------|----------|
| Raw Material | 160 |

| | |
|---------------|-----|
| Direct Labour | 60 |
| Overhead | 120 |
| Total Cost | 340 |
| Profit | 60 |
| Selling Price | 400 |

Raw material is held in stock on an average for four weeks. Materials are in process on an average for two weeks. Finished goods are in stock on an average for four weeks. Credit allowed by supplier four weeks. Credit allowed to debtors eight weeks. 100% of material cost and 50% of conversion cost comprise of work-in-progress. Time lag in payment of wages and overheads are 1½ week and four weeks respectively.

Other information:

Cash in hand/bank 5% of gross working capital
Expected level of production 1,04,000 units
One year is taken as 52 weeks.
Production is carried evenly throughout the year.
State your assumptions, if any

Present Value and Future Value Tables

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

| n \ k | 1% | 2% | 3% | 4% | 5% | 6% | 7% | 8% | 9% | 10% | 11% | 12% | 13% | 14% | 15% | 16% | 17% | 18% | 19% | 20% |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 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 | 1.1700 | 1.1800 | 1.1900 | 1.2000 |
| 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 | 1.3689 | 1.3924 | 1.4161 | 1.4400 |
| 3 | 1.0303 | 1.0612 | 1.0927 | 1.1248 | 1.1575 | 1.1908 | 1.2247 | 1.2592 | 1.2943 | 1.3299 | 1.3660 | 1.4027 | 1.4400 | 1.4778 | 1.5161 | 1.5549 | 1.5942 | 1.6340 | 1.6743 | 1.7151 |
| 4 | 1.0406 | 1.0824 | 1.1253 | 1.1694 | 1.2147 | 1.2612 | 1.3089 | 1.3578 | 1.4069 | 1.4572 | 1.5087 | 1.5614 | 1.6153 | 1.6704 | 1.7267 | 1.7842 | 1.8429 | 1.9028 | 1.9639 | 2.0262 |
| 5 | 1.0510 | 1.1041 | 1.1583 | 1.2137 | 1.2704 | 1.3284 | 1.3877 | 1.4482 | 1.5099 | 1.5728 | 1.6369 | 1.7022 | 1.7687 | 1.8364 | 1.9053 | 1.9754 | 2.0467 | 2.1192 | 2.1929 | 2.2678 |
| 6 | 1.0615 | 1.1262 | 1.1917 | 1.2584 | 1.3263 | 1.3954 | 1.4657 | 1.5372 | 1.6099 | 1.6838 | 1.7589 | 1.8352 | 1.9127 | 1.9914 | 2.0713 | 2.1524 | 2.2347 | 2.3182 | 2.4029 | 2.4888 |
| 7 | 1.0721 | 1.1480 | 1.2247 | 1.3024 | 1.3811 | 1.4608 | 1.5415 | 1.6232 | 1.7059 | 1.7896 | 1.8743 | 1.9600 | 2.0467 | 2.1344 | 2.2231 | 2.3128 | 2.4035 | 2.4952 | 2.5879 | 2.6816 |
| 8 | 1.0828 | 1.1698 | 1.2577 | 1.3466 | 1.4364 | 1.5271 | 1.6187 | 1.7112 | 1.8046 | 1.8989 | 1.9941 | 2.0901 | 2.1870 | 2.2848 | 2.3835 | 2.4831 | 2.5836 | 2.6849 | 2.7871 | 2.8901 |
| 9 | 1.0936 | 1.1918 | 1.2901 | 1.3894 | 1.4896 | 1.5907 | 1.6927 | 1.7955 | 1.8992 | 2.0038 | 2.1093 | 2.2156 | 2.3227 | 2.4306 | 2.5393 | 2.6487 | 2.7588 | 2.8696 | 2.9811 | 3.0933 |
| 10 | 1.1046 | 1.2140 | 1.3235 | 1.4331 | 1.5437 | 1.6553 | 1.7679 | 1.8815 | 1.9961 | 2.1117 | 2.2283 | 2.3458 | 2.4642 | 2.5835 | 2.7037 | 2.8247 | 2.9465 | 3.0691 | 3.1925 | 3.3167 |
| 11 | 1.1157 | 1.2362 | 1.3459 | 1.4566 | 1.5682 | 1.6808 | 1.7943 | 1.9088 | 2.0242 | 2.1405 | 2.2577 | 2.3758 | 2.4947 | 2.6145 | 2.7352 | 2.8567 | 2.9790 | 3.1021 | 3.2260 | 3.3507 |
| 12 | 1.1269 | 1.2484 | 1.3583 | 1.4690 | 1.5815 | 1.6949 | 1.8092 | 1.9244 | 2.0405 | 2.1575 | 2.2754 | 2.3941 | 2.5136 | 2.6339 | 2.7550 | 2.8769 | 2.9996 | 3.1231 | 3.2473 | 3.3722 |
| 13 | 1.1382 | 1.2608 | 1.3709 | 1.4826 | 1.5959 | 1.7099 | 1.8247 | 1.9403 | 2.0567 | 2.1739 | 2.2919 | 2.4107 | 2.5303 | 2.6507 | 2.7718 | 2.8936 | 3.0161 | 3.1393 | 3.2632 | 3.3878 |
| 14 | 1.1495 | 1.2733 | 1.3836 | 1.4963 | 1.6094 | 1.7232 | 1.8378 | 1.9532 | 2.0693 | 2.1861 | 2.3036 | 2.4218 | 2.5407 | 2.6603 | 2.7806 | 2.9016 | 3.0233 | 3.1457 | 3.2687 | 3.3923 |
| 15 | 1.1609 | 1.2868 | 1.3973 | 1.5110 | 1.6250 | 1.7396 | 1.8549 | 1.9709 | 2.0876 | 2.2050 | 2.3230 | 2.4416 | 2.5608 | 2.6806 | 2.8010 | 2.9220 | 3.0436 | 3.1658 | 3.2886 | 3.4120 |
| 16 | 1.1724 | 1.3004 | 1.4111 | 1.5258 | 1.6407 | 1.7561 | 1.8720 | 1.9885 | 2.1056 | 2.2233 | 2.3416 | 2.4604 | 2.5797 | 2.6995 | 2.8199 | 2.9408 | 3.0623 | 3.1844 | 3.3071 | 3.4304 |
| 17 | 1.1839 | 1.3141 | 1.4250 | 1.5407 | 1.6557 | 1.7712 | 1.8873 | 2.0039 | 2.1211 | 2.2388 | 2.3570 | 2.4757 | 2.5949 | 2.7146 | 2.8348 | 2.9555 | 3.0767 | 3.1984 | 3.3207 | 3.4435 |
| 18 | 1.1955 | 1.3279 | 1.4381 | 1.5546 | 1.6697 | 1.7853 | 1.9015 | 2.0182 | 2.1354 | 2.2531 | 2.3713 | 2.4899 | 2.6090 | 2.7286 | 2.8487 | 2.9692 | 3.0902 | 3.2117 | 3.3337 | 3.4561 |
| 19 | 1.2071 | 1.3418 | 1.4551 | 1.5696 | 1.6852 | 1.8010 | 1.9173 | 2.0341 | 2.1514 | 2.2691 | 2.3872 | 2.5057 | 2.6246 | 2.7439 | 2.8636 | 2.9837 | 3.1042 | 3.2251 | 3.3464 | 3.4681 |
| 20 | 1.2188 | 1.3558 | 1.4693 | 1.5848 | 1.7014 | 1.8182 | 1.9354 | 2.0531 | 2.1713 | 2.2899 | 2.4088 | 2.5280 | 2.6475 | 2.7673 | 2.8875 | 3.0081 | 3.1290 | 3.2503 | 3.3719 | 3.4938 |
| 21 | 1.2305 | 1.3699 | 1.4836 | 1.5991 | 1.7167 | 1.8346 | 1.9528 | 2.0714 | 2.1904 | 2.3097 | 2.4293 | 2.5491 | 2.6691 | 2.7894 | 2.9100 | 3.0308 | 3.1519 | 3.2733 | 3.3950 | 3.5169 |
| 22 | 1.2423 | 1.3840 | 1.4979 | 1.6136 | 1.7322 | 1.8503 | 1.9687 | 2.0874 | 2.2064 | 2.3257 | 2.4452 | 2.5649 | 2.6848 | 2.8049 | 2.9252 | 3.0458 | 3.1666 | 3.2877 | 3.4090 | 3.5305 |
| 23 | 1.2541 | 1.3982 | 1.5118 | 1.6284 | 1.7470 | 1.8653 | 1.9839 | 2.1027 | 2.2217 | 2.3409 | 2.4603 | 2.5798 | 2.6995 | 2.8194 | 2.9394 | 3.0596 | 3.1799 | 3.3004 | 3.4211 | 3.5419 |
| 24 | 1.2660 | 1.4125 | 1.5258 | 1.6432 | 1.7617 | 1.8799 | 1.9984 | 2.1171 | 2.2361 | 2.3552 | 2.4745 | 2.5939 | 2.7134 | 2.8331 | 2.9529 | 3.0728 | 3.1928 | 3.3129 | 3.4331 | 3.5534 |
| 25 | 1.2779 | 1.4268 | 1.5397 | 1.6580 | 1.7765 | 1.8948 | 2.0133 | 2.1321 | 2.2511 | 2.3702 | 2.4894 | 2.6087 | 2.7281 | 2.8476 | 2.9672 | 3.0868 | 3.2065 | 3.3263 | 3.4461 | 3.5660 |
| 26 | 1.2898 | 1.4412 | 1.5537 | 1.6723 | 1.7908 | 1.9091 | 2.0276 | 2.1463 | 2.2652 | 2.3842 | 2.5033 | 2.6225 | 2.7417 | 2.8610 | 2.9803 | 3.1000 | 3.2197 | 3.3394 | 3.4591 | 3.5789 |
| 27 | 1.3017 | 1.4556 | 1.5678 | 1.6861 | 1.8045 | 1.9228 | 2.0413 | 2.1599 | 2.2787 | 2.3975 | 2.5164 | 2.6353 | 2.7543 | 2.8733 | 2.9923 | 3.1113 | 3.2303 | 3.3492 | 3.4681 | 3.5870 |
| 28 | 1.3137 | 1.4700 | 1.5803 | 1.7006 | 1.8190 | 1.9373 | 2.0557 | 2.1742 | 2.2928 | 2.4114 | 2.5299 | 2.6484 | 2.7669 | 2.8854 | 2.9999 | 3.1193 | 3.2387 | 3.3580 | 3.4772 | 3.5964 |
| 29 | 1.3257 | 1.4844 | 1.5928 | 1.7149 | 1.8332 | 1.9514 | 2.0697 | 2.1881 | 2.3064 | 2.4247 | 2.5429 | 2.6611 | 2.7792 | 2.8972 | 3.0151 | 3.1330 | 3.2508 | 3.3685 | 3.4861 | 3.6036 |
| 30 | 1.3377 | 1.4988 | 1.6063 | 1.7298 | 1.8480 | 1.9661 | 2.0842 | 2.2023 | 2.3203 | 2.4382 | 2.5560 | 2.6737 | 2.7913 | 2.9088 | 3.0261 | 3.1433 | 3.2604 | 3.3773 | 3.4941 | 3.6108 |
| 31 | 1.3497 | 1.5132 | 1.6183 | 1.7447 | 1.8628 | 1.9808 | 2.0987 | 2.2165 | 2.3342 | 2.4518 | 2.5693 | 2.6867 | 2.8040 | 2.9211 | 3.0380 | 3.1548 | 3.2715 | 3.3880 | 3.5044 | 3.6206 |
| 32 | 1.3617 | 1.5276 | 1.6303 | 1.7596 | 1.8776 | 1.9955 | 2.1132 | 2.2308 | 2.3483 | 2.4657 | 2.5829 | 2.7000 | 2.8169 | 2.9336 | 3.0501 | 3.1664 | 3.2826 | 3.3986 | 3.5144 | 3.6300 |
| 33 | 1.3737 | 1.5420 | 1.6423 | 1.7745 | 1.8924 | 2.0092 | 2.1267 | 2.2440 | 2.3611 | 2.4780 | 2.5947 | 2.7112 | 2.8275 | 2.9436 | 3.0595 | 3.1752 | 3.2907 | 3.4060 | 3.5211 | 3.6360 |
| 34 | 1.3857 | 1.5564 | 1.6543 | 1.7894 | 1.9072 | 2.0239 | 2.1412 | 2.2582 | 2.3750 | 2.4916 | 2.6080 | 2.7241 | 2.8399 | 2.9555 | 3.0709 | 3.1861 | 3.3011 | 3.4158 | 3.5303 | 3.6446 |
| 35 | 1.3977 | 1.5708 | 1.6663 | 1.8043 | 1.9220 | 2.0386 | 2.1556 | 2.2723 | 2.3888 | 2.5051 | 2.6211 | 2.7368 | 2.8522 | 2.9673 | 3.0821 | 3.1967 | 3.3111 | 3.4252 | 3.5391 | 3.6528 |
| 36 | 1.4097 | 1.5852 | 1.6783 | 1.8192 | 1.9368 | 2.0532 | 2.1700 | 2.2865 | 2.4027 | 2.5186 | 2.6342 | 2.7495 | 2.8645 | 2.9792 | 3.0936 | 3.2077 | 3.3215 | 3.4351 | 3.5484 | 3.6615 |
| 37 | 1.4217 | 1.5996 | 1.6903 | 1.8341 | 1.9516 | 2.0678 | 2.1843 | 2.3006 | 2.4165 | 2.5321 | 2.6474 | 2.7623 | 2.8769 | 2.9911 | 3.1050 | 3.2187 | 3.3321 | 3.4452 | 3.5581 | 3.6708 |
| 38 | 1.4337 | 1.6140 | 1.7023 | 1.8490 | 1.9663 | 2.0823 | 2.1986 | 2.3146 | 2.4303 | 2.5457 | 2.6607 | 2.7753 | 2.8896 | 3.0035 | 3.1171 | 3.2304 | 3.3433 | 3.4559 | 3.5682 | 3.6802 |
| 39 | 1.4457 | 1.6284 | 1.7143 | 1.8639 | 1.9810 | 2.0968 | 2.2128 | 2.3284 | 2.4437 | 2.5586 | 2.6731 | 2.7872 | 2.9009 | 3.0142 | 3.1271 | 3.2397 | 3.3519 | 3.4637 | 3.5752 | 3.6864 |
| 40 | 1.4577 | 1.6428 | 1.7263 | 1.8788 | 1.9957 | 2.1113 | 2.2270 | 2.3423 | 2.4572 | 2.5717 | 2.6858 | 2.7994 | 2.9125 | 3.0251 | 3.1373 | 3.2491 | 3.3605 | 3.4715 | 3.5821 | 3.6924 |
| 41 | 1.4697 | 1.6572 | 1.7383 | 1.8937 | 2.0104 | 2.1258 | 2.2412 | 2.3561 | 2.4706 | 2.5846 | 2.6981 | 2.8111 | 2.9236 | 3.0356 | 3.1471 | 3.2581 | 3.3687 | 3.4789 | 3.5887 | 3.6981 |
| 42 | 1.4817 | 1.6716 | 1.7503 | 1.9086 | 2.0250 | 2.1401 | 2.2553 | 2.3700 | 2.4842 | 2.5979 | 2.7111 | 2.8237 | 2.9357 | 3.0471 | 3.1580 | 3.2685 | 3.3786 | 3.4882 | 3.5974 | 3.7062 |
| 43 | 1.4937 | 1.6860 | 1.7623 | 1.9235 | 2.0392 | 2.1540 | 2.2690 | 2.3834 | 2.4972 | 2.6105 | 2.7231 | 2.8351 | 2.9465 | 3.0573 | 3.1676 | 3.2774 | 3.3867 | 3.4955 | 3.6038 | 3.7116 |
| 44 | 1.5057 | 1.7004 | 1.7743 | 1.9384 | 2.0533 | 2.1678 | 2.2825 | 2.3966 | 2.5101 | 2.6230 | 2.7353 | 2.8470 | 2.9581 | 3.0686 | 3.1785 | 3.2878 | 3.3966 | 3.5049 | 3.6126 | 3.7198 |
| 45 | 1.5177 | 1.7148 | 1.7863 | 1.9533 | 2.0681 | 2.1823 | 2.2966 | 2.4103 | 2.5234 | 2.6359 | 2.7477 | 2.8588 | 2.9692 | 3.0789 | 3.1881 | 3.2968 | 3.4050 | 3.5126 | 3.6197 | 3.7262 |
| 46 | 1.5297 | 1.7292 | 1.7983 | 1.9682 | 2.0828 | 2.1967 | 2.3106 | 2.4239 | 2.5365 | 2.6484 | 2.7596 | 2.8701 | 2.9800 | 3.0892 | 3.1978 | 3.3059 | 3.4134 | 3.5204 | 3.6268 | 3.7326 |
| 47 | 1.5417 | 1.7436 | 1.8103 | 1.9831 | 2.0973 | 2.2109 | 2.3245 | 2.4374 | 2.5496 | 2.6611 | 2.7718 | 2.8818 | 2.9911 | 3.1000 | 3.2083 | 3.3161 | 3.4234 | 3.5301 | 3.6362 | 3.7416 |
| 48 | 1.5537 | 1.7580 | 1.8223 | 1.9980 | 2.1118 | 2. | | | | | | | | | | | | | | |

Present Value and Future Value Tables

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

| n \ k | 1% | 2% | 3% | 4% | 5% | 6% | 7% | 8% | 9% | 10% | 11% | 12% | 13% | 14% | 15% | 16% | 17% | 18% | 19% | 20% |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 1 | 0.9901 | 0.9804 | 0.9708 | 0.9613 | 0.9519 | 0.9426 | 0.9334 | 0.9243 | 0.9152 | 0.9062 | 0.8973 | 0.8884 | 0.8796 | 0.8709 | 0.8623 | 0.8537 | 0.8452 | 0.8368 | 0.8284 | 0.8201 |
| 2 | 0.9804 | 0.9610 | 0.9426 | 0.9243 | 0.9062 | 0.8884 | 0.8709 | 0.8537 | 0.8368 | 0.8201 | 0.8037 | 0.7875 | 0.7715 | 0.7558 | 0.7403 | 0.7250 | 0.7100 | 0.6952 | 0.6806 | 0.6663 |
| 3 | 0.9708 | 0.9426 | 0.9152 | 0.8884 | 0.8623 | 0.8368 | 0.8119 | 0.7875 | 0.7637 | 0.7403 | 0.7174 | 0.6952 | 0.6736 | 0.6525 | 0.6319 | 0.6117 | 0.5920 | 0.5728 | 0.5540 | 0.5357 |
| 4 | 0.9613 | 0.9152 | 0.8709 | 0.8284 | 0.7875 | 0.7481 | 0.7093 | 0.6711 | 0.6344 | 0.5992 | 0.5654 | 0.5331 | 0.5022 | 0.4727 | 0.4445 | 0.4177 | 0.3923 | 0.3682 | 0.3453 | 0.3236 |
| 5 | 0.9519 | 0.8884 | 0.8368 | 0.7875 | 0.7403 | 0.6952 | 0.6525 | 0.6117 | 0.5728 | 0.5357 | 0.4992 | 0.4643 | 0.4309 | 0.3989 | 0.3682 | 0.3389 | 0.3109 | 0.2842 | 0.2588 | 0.2346 |
| 6 | 0.9426 | 0.8623 | 0.8037 | 0.7481 | 0.6952 | 0.6443 | 0.5952 | 0.5481 | 0.5029 | 0.4596 | 0.4181 | 0.3784 | 0.3404 | 0.3041 | 0.2694 | 0.2362 | 0.2044 | 0.1740 | 0.1450 | 0.1174 |
| 7 | 0.9334 | 0.8452 | 0.7715 | 0.7093 | 0.6525 | 0.5992 | 0.5481 | 0.4992 | 0.4529 | 0.4092 | 0.3671 | 0.3265 | 0.2874 | 0.2497 | 0.2134 | 0.1784 | 0.1447 | 0.1123 | 0.0811 | 0.0512 |
| 8 | 0.9243 | 0.8201 | 0.7368 | 0.6637 | 0.6062 | 0.5541 | 0.5031 | 0.4541 | 0.4071 | 0.3620 | 0.3188 | 0.2774 | 0.2377 | 0.1996 | 0.1630 | 0.1279 | 0.0942 | 0.0619 | 0.0309 | 0.0012 |
| 9 | 0.9152 | 0.8037 | 0.7103 | 0.6271 | 0.5692 | 0.5171 | 0.4661 | 0.4171 | 0.3701 | 0.3250 | 0.2818 | 0.2404 | 0.2007 | 0.1625 | 0.1257 | 0.0904 | 0.0565 | 0.0240 | 0.0027 | 0.0000 |
| 10 | 0.9062 | 0.7875 | 0.6843 | 0.5911 | 0.5331 | 0.4811 | 0.4301 | 0.3811 | 0.3341 | 0.2890 | 0.2458 | 0.2044 | 0.1647 | 0.1265 | 0.0897 | 0.0543 | 0.0203 | 0.0077 | 0.0000 | 0.0000 |
| 11 | 0.8973 | 0.7715 | 0.6581 | 0.5649 | 0.5069 | 0.4549 | 0.4039 | 0.3549 | 0.3079 | 0.2628 | 0.2196 | 0.1782 | 0.1385 | 0.1003 | 0.0635 | 0.0281 | 0.0047 | 0.0000 | 0.0000 | 0.0000 |
| 12 | 0.8884 | 0.7558 | 0.6326 | 0.5394 | 0.4814 | 0.4294 | 0.3784 | 0.3294 | 0.2824 | 0.2373 | 0.1941 | 0.1527 | 0.1130 | 0.0747 | 0.0377 | 0.0029 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 13 | 0.8796 | 0.7368 | 0.6036 | 0.5104 | 0.4524 | 0.3994 | 0.3484 | 0.2994 | 0.2524 | 0.2073 | 0.1641 | 0.1227 | 0.0830 | 0.0447 | 0.0097 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 14 | 0.8709 | 0.7174 | 0.5742 | 0.4810 | 0.4230 | 0.3700 | 0.3190 | 0.2700 | 0.2230 | 0.1779 | 0.1347 | 0.0933 | 0.0536 | 0.0153 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 15 | 0.8623 | 0.7001 | 0.5469 | 0.4537 | 0.3957 | 0.3427 | 0.2917 | 0.2427 | 0.1957 | 0.1506 | 0.1074 | 0.0660 | 0.0263 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 16 | 0.8537 | 0.6835 | 0.5203 | 0.4271 | 0.3691 | 0.3161 | 0.2651 | 0.2161 | 0.1700 | 0.1259 | 0.0837 | 0.0430 | 0.0033 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 17 | 0.8452 | 0.6663 | 0.4931 | 0.4000 | 0.3420 | 0.2890 | 0.2380 | 0.1890 | 0.1429 | 0.0988 | 0.0566 | 0.0169 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 18 | 0.8368 | 0.6481 | 0.4750 | 0.3819 | 0.3239 | 0.2709 | 0.2199 | 0.1709 | 0.1248 | 0.0807 | 0.0385 | 0.0088 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 19 | 0.8284 | 0.6300 | 0.4569 | 0.3638 | 0.3058 | 0.2528 | 0.2018 | 0.1528 | 0.1067 | 0.0626 | 0.0204 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 20 | 0.8201 | 0.6119 | 0.4388 | 0.3457 | 0.2877 | 0.2347 | 0.1837 | 0.1347 | 0.0886 | 0.0445 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

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

| n \ k | 1% | 2% | 3% | 4% | 5% | 6% | 7% | 8% | 9% | 10% | 11% | 12% | 13% | 14% | 15% | 16% | 17% | 18% | 19% | 20% |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 1 | 0.9901 | 0.9804 | 0.9708 | 0.9613 | 0.9519 | 0.9426 | 0.9334 | 0.9243 | 0.9152 | 0.9062 | 0.8973 | 0.8884 | 0.8796 | 0.8709 | 0.8623 | 0.8537 | 0.8452 | 0.8368 | 0.8284 | 0.8201 |
| 2 | 1.9704 | 1.9446 | 1.9193 | 1.8944 | 1.8699 | 1.8458 | 1.8220 | 1.7985 | 1.7753 | 1.7524 | 1.7298 | 1.7075 | 1.6854 | 1.6635 | 1.6418 | 1.6203 | 1.5990 | 1.5779 | 1.5570 | 1.5363 |
| 3 | 2.9410 | 2.8939 | 2.8476 | 2.8021 | 2.7574 | 2.7134 | 2.6701 | 2.6274 | 2.5853 | 2.5438 | 2.5028 | 2.4623 | 2.4223 | 2.3828 | 2.3438 | 2.3052 | 2.2671 | 2.2295 | 2.1924 | 2.1558 |
| 4 | 3.9020 | 3.8377 | 3.7741 | 3.7112 | 3.6490 | 3.5875 | 3.5266 | 3.4663 | 3.4066 | 3.3474 | 3.2887 | 3.2305 | 3.1728 | 3.1156 | 3.0589 | 3.0027 | 2.9470 | 2.8918 | 2.8371 | 2.7828 |
| 5 | 4.8534 | 4.7735 | 4.6946 | 4.6167 | 4.5397 | 4.4636 | 4.3883 | 4.3138 | 4.2400 | 4.1669 | 4.0945 | 4.0228 | 3.9517 | 3.8812 | 3.8113 | 3.7419 | 3.6730 | 3.6046 | 3.5367 | 3.4693 |
| 6 | 5.7955 | 5.6914 | 5.5881 | 5.4856 | 5.3839 | 5.2829 | 5.1826 | 5.0830 | 4.9840 | 4.8856 | 4.7878 | 4.6906 | 4.5940 | 4.4980 | 4.4026 | 4.3078 | 4.2135 | 4.1197 | 4.0264 | 3.9336 |
| 7 | 6.7282 | 6.6100 | 6.4926 | 6.3760 | 6.2600 | 6.1446 | 6.0298 | 5.9156 | 5.8020 | 5.6889 | 5.5763 | 5.4643 | 5.3528 | 5.2418 | 5.1313 | 5.0214 | 4.9120 | 4.8031 | 4.6947 | 4.5868 |
| 8 | 7.6517 | 7.5195 | 7.3881 | 7.2574 | 7.1273 | 6.9978 | 6.8689 | 6.7405 | 6.6126 | 6.4852 | 6.3583 | 6.2319 | 6.1060 | 5.9806 | 5.8557 | 5.7313 | 5.6074 | 5.4840 | 5.3611 | 5.2387 |
| 9 | 8.5660 | 8.4198 | 8.2744 | 8.1297 | 7.9856 | 7.8420 | 7.6989 | 7.5563 | 7.4142 | 7.2726 | 7.1315 | 6.9909 | 6.8507 | 6.7109 | 6.5716 | 6.4328 | 6.2944 | 6.1564 | 6.0188 | 5.8816 |
| 10 | 9.4713 | 9.3111 | 9.1516 | 9.0028 | 8.8546 | 8.7069 | 8.5597 | 8.4130 | 8.2667 | 8.1208 | 7.9754 | 7.8304 | 7.6858 | 7.5416 | 7.3978 | 7.2544 | 7.1114 | 6.9688 | 6.8265 | 6.6846 |
| 11 | 10.3680 | 10.1938 | 10.0203 | 9.8474 | 9.6750 | 9.5031 | 9.3316 | 9.1605 | 8.9898 | 8.8195 | 8.6496 | 8.4799 | 8.3105 | 8.1414 | 7.9726 | 7.8041 | 7.6358 | 7.4677 | 7.2998 | 7.1322 |
| 12 | 11.2555 | 11.0673 | 10.8800 | 10.6935 | 10.5076 | 10.3223 | 10.1375 | 9.9531 | 9.7691 | 9.5855 | 9.4024 | 9.2197 | 9.0374 | 8.8554 | 8.6737 | 8.4923 | 8.3112 | 8.1303 | 7.9496 | 7.7691 |
| 13 | 12.1338 | 11.9317 | 11.7314 | 11.5318 | 11.3328 | 11.1343 | 10.9363 | 10.7387 | 10.5415 | 10.3447 | 10.1483 | 9.9523 | 9.7566 | 9.5612 | 9.3661 | 9.1712 | 8.9766 | 8.7822 | 8.5880 | 8.3940 |
| 14 | 13.0028 | 12.7868 | 12.5726 | 12.3591 | 12.1462 | 11.9338 | 11.7218 | 11.5102 | 11.2990 | 11.0881 | 10.8776 | 10.6674 | 10.4575 | 10.2479 | 10.0386 | 9.8296 | 9.6208 | 9.4122 | 9.2038 | 8.9956 |
| 15 | 13.8624 | 13.6325 | 13.4044 | 13.1779 | 12.9520 | 12.7266 | 12.5017 | 12.2773 | 12.0534 | 11.8299 | 11.6068 | 11.3840 | 11.1615 | 10.9393 | 10.7174 | 10.4958 | 10.2744 | 10.0532 | 9.8322 | 9.6114 |
| 16 | 14.7125 | 14.4687 | 14.2268 | 13.9867 | 13.7473 | 13.5085 | 13.2702 | 13.0324 | 12.7950 | 12.5581 | 12.3216 | 12.0855 | 11.8498 | 11.6144 | 11.3793 | 11.1444 | 10.9097 | 10.6752 | 10.4409 | 10.2068 |
| 17 | 15.5531 | 15.2955 | 15.0398 | 14.7859 | 14.5326 | 14.2800 | 14.0279 | 13.7763 | 13.5252 | 13.2746 | 13.0244 | 12.7746 | 12.5251 | 12.2759 | 12.0270 | 11.7784 | 11.5301 | 11.2820 | 11.0341 | 10.7864 |
| 18 | 16.3842 | 16.1130 | 15.8437 | 15.5752 | 15.3074 | 15.0402 | 14.7735 | 14.5072 | 14.2414 | 13.9760 | 13.7110 | 13.4463 | 13.1819 | 12.9178 | 12.6539 | 12.3902 | 12.1267 | 11.8634 | 11.6002 | 11.3371 |
| 19 | 17.2057 | 16.9210 | 16.6381 | 16.3559 | 16.0743 | 15.7933 | 15.5128 | 15.2328 | 14.9532 | 14.6741 | 14.3954 | 14.1171 | 13.8392 | 13.5616 | 13.2843 | 13.0073 | 12.7306 | 12.4541 | 12.1778 | 11.9017 |
| 20 | 18.0175 | 17.7191 | 17.4224 | 17.1264 | 16.8310 | 16.5361 | 16.2417 | 15.9478 | 15.6543 | 15.3613 | 15.0688 | 14.7767 | 14.4850 | 14.1937 | 13.9027 | 13.6120 | 13.3216 | 13.0314 | 12.7414 | 12.4516 |
| 21 | 18.8195 | 18.5075 | 18.1971 | 17.8873 | 17.5780 | 17.2692 | 16.9608 | 16.6528 | 16.3452 | 16.0380 | 15.7312 | 15.4248 | 15.1187 | 14.8129 | 14.5074 | 14.2022 | 13.8972 | 13.5924 | 13.2878 | 12.9834 |
| 22 | 19.6115 | 19.2850 | 18.9601 | 18.6358 | 18.3120 | 17.9887 | 17.6658 | 17.3433 | 17.0211 | 16.6993 | 16.3778 | 16.0565 | 15.7354 | 15.4145 | 15.0938 | 14.7733 | 14.4530 | 14.1328 | 13.8128 | 13.4929 |
| 23 | 20.3935 | 20.0530 | 19.7141 | 19.3757 | 19.0378 | 18.6993 | 18.3612 | 18.0235 | 17.6861 | 17.3490 | 17.0121 | 16.6754 | 16.3389 | 16.0026 | 15.6664 | 15.3303 | 14.9943 | 14.6584 | 14.3226 | 13.9868 |
| 24 | 21.1654 | 20.8105 | 20.4571 | 20.1041 | 19.7515 | 19.3992 | 19.0472 | 18.6954 | 18.3438 | 17.9923 | 17.6409 | 17.2896 | 16.9384 | 16.5872 | 16.2361 | 15.8850 | 15.5340 | 15.1830 | 14.8320 | 14.4810 |
| 25 | 21.9271 | 21.5570 | 21.1884 | 20.8202 | 20.4523 | 20.0847 | 19.7173 | 19.3501 | 18.9830 | 18.6160 | 18.2491 | 17.8822 | 17.5153 | 17.1484 | 16.7815 | 16.4146 | 16.0477 | 15.6807 | 15.3137 | 14.9467 |
| 26 | 22.6785 | 22. | | | | | | | | | | | | | | | | | | |