UNIVERSITI SAINS MALAYSIA

Peperiksaan Semester Pertama
Sidang 1988/89

ATP 200 - Prinsip-Prinsip Kewangan

Tarikh : 26 Oktober 1988 Masa : 2.15 petang - 5.15 petang
(3 jam)

Jawab SEMUA soalan daripada Bahagian A dan TIGA soalan daripada Bahagian B.

BAHAGIAN A

1. Pada 3hb. Februari, 1988, pengurus kewangan Syarikat Mega menghubungi En. Hanafi, pegawai pinjaman Bank D & C mengenai satu pinjaman yang akan digunakan oleh syarikat untuk menjelaskan nota belum bayar dan juga untuk membiayai aset semasa. Syarikat Mega merancang untuk menjelaskan jumlah pinjaman dan bunga di dalam masa satu tahun. Bersama dengan permohonan pinjaman, syarikat telah melampirkan maklumat dan penyata-penyata kewangan yang berikut:

Syarikat Mega
Kunci Kira-kira
Seperti pada 31/12/86 dan 31/12/87

	1986	1987
Tunai	$ 9,000	$ 500
Akaun belum terima	$ 12,500	$ 16,000
Inventori	$ 29,000	$ 45,500
Aset semasa	$ 50,500	$ 62,000
Tanah	$ 20,000	$ 26,000
Bangunan dan peralatan ...	$ 70,000	$100,000
Kurang: S/N terkumpul ...	$ 28,000	$ 38,000
Aset tetap bersih	$ 62,000	$ 88,000
Jumlah aset	$112,500	$150,000

[ATP 200]

	1986	1987
Akaun belum bayar	$ 10,500	$ 22,000
Nota bank	$ 17,000	$ 47,000
Jumlah liabiliti semasa	$ 27,500	$ 69,000
Hutang jangka panjang ...	$ 28,750	$ 22,950
Saham biasa	$ 31,500	$ 31,500
Perolehan tertahan	$ 24,750	$ 26,550
Jumlah liabiliti & EPS	$112,500	$150,000

Syarikat Mega
Penyata Pendapatan
Bagi Tahun Berakhir 31/12

	1986	1987
Jualan	$125,000	$160,000
Kos barang dijual	$ 75,000	$ 96,000
Keuntungan kasar	$ 50,000	$ 64,000
Belanja kendalian:		
Belanja operasi tetap ..	$ 21,000	$ 21,000
Belanja operasi berubah	$ 12,500	$ 16,000
Susutnilai	$ 4,500	$ 10,000
Jumlah belanja operasi ..	$ 38,000	$ 47,000
Pendapatan sebelum cukai dan bunga	$ 12,000	$ 17,000
Bunga	$ 3,000	$ 6,100
Pendapatan sebelum cukai	$ 9,000	$ 10,900
Cukai	$ 4,500	$ 5,450
Pendapatan bersih	$ 4,500	$ 5,450

...3/-

[ATP 200]

Nisbah-nisbah Kewangan

	Purata Industri	1986	1987
Nisbah semasa	1.8	1.84	0.9
Nisbah ujian mampu	0.7	0.78	0.24
Purata tempoh kutipan	37 hr	36 hr.	36 hr.
Pusing ganti inventori	2.5	2.59	2.11
Hutang/Jumlah aset	58%	50%	61.3%
Hutang jangka panjang/ Jumlah permodalan	33%	33.8%	28.3%
Nisbah pembayaran bunga	3.8	4	2.79
Margin keuntungan kasar	38%	40%	40%
Margin keuntungan operasi ..	10%	9.6%	10.6%
Margin keuntungan bersih ...	3.5%	3.6%	3.4%
Pusing ganti jumlah aset ...	1.14	1.11	1.07
Pusing ganti aset tetap	1.4	2.02	1.82
Pulangan atas jumlah aset ..	4%	4%	3.6%
Pulangan atas ekuiti	9.5%	8%	9.4%

Dikehendaki:

(a) Sediakan penyata perubahan kedudukan kewangan untuk 1987.

(b) Berdasarkan analisis siri masa dan silang bahagian, komen pencapaian keadaan kewangan Syarikat Mega mengikut golongan nisbah-nisbah kewangan.

(c) Berdasarkan maklumat yang ada, pertimbangkan permohonan pinjaman syarikat. Adakah syarikat patut diberi pinjaman tersebut? Terangkan.

(25 markah)

2. Anda diminta untuk mempertimbangkan tiga jenis pelaburan. Jenis pertama ialah bon yang dijual dipasaran pada harga $1,100. Bon tersebut mempunyai nilai tara $1,000 , bunga dibayar pada 13% dan mempunyai tempoh matang 15 tahun. Untuk bon jenis ini, kadar pulangan dikehendaki dipercayai pada 14%.

Pelaburan jenis kedua ialah saham terutama ($100 nilai tara) yang dijual pada $90 sesyer dan dibayar dividen tahunan sebanyak $13. Kadar pulangan dikehendaki ke atas saham ini ialah 15%.

Jenis yang ketiga ialah saham biasa ($25 nilai tara) yang baru-baru ini dibayar dividen sebanyak $2 sesyer. Pendapatan sesyer syarikat telah meningkat dari $3 ke $6 di dalam masa 10 tahun. Saham ini boleh dipasarkan pada harga $20 sesyer. Kadar pulangan dikehendaki bagi saham ini ialah 20%.

Dikehendaki:

(a) Berdasarkan kadar pulangan dikehendaki yang diberi di atas, cari nilai setiap jenis pelaburan. Pelaburan mana patut diterima? Kenapa?

(b) Jawab bahagian (a) semula sekiranya kadar pulangan dikehendaki bertukar kepada 12% untuk bon, 14% untuk saham terutama, dan 18% untuk saham biasa.

(c) Andaikan semula bahawa kadar pulangan dikehendaki untuk saham biasa ialah 20%, tetapi kadar pertumbuhannya berubah menjadi 12%, adakah jawapan anda pada bahagian (a) akan berubah?

28 (15 markah)

3. (a) Syarikat membeli mesin berharga $50,000. $10,000 telah dijelaskan dan baki seterusnya akan dibayar secara ansuran dengan bayaran yang sama selama 10 tahun. Bayaran tahunan ini akan termasuk prinsip dan bunga (10% dikenakan) ke atas baki yang belum dijelaskan. Berapakah jumlah bayaran tahunan syarikat?

(b) Berapakah jumlah yang perlu didepositkan hari ini supaya anda boleh mengeluarkan $10,000 setahun untuk 5 tahun, bermula 11 tahun dari sekarang. (Tempoh 11 hingga 15) dan anda juga ingin mengeluarkan jumlah tambahan sebanyak $20,000 pada tahun akhir (tempoh 15)? (Andaikan kadar faedah pada 6%).

[Guna jadual nilai kini dan nilai hadapan yang dilampirkan.]

(10 markah)

4. Supaya setanding dengan pesaing, Syarikat Motor, ingin mengurangkan syarat jualan kreditnya. Dianggarkan, kelonggaran ini akan mempertingkatkan jualan 15% iaitu daripada 5,000 motosikal ke 5,750 untuk tahun hadapan. Purata tempoh kutipan dianggarkan akan bertambah dari 35 hari ke 45 hari, dan hutang lapuk dianggar bertambah dari 2% ke 3%. Purata harga jualan untuk satu unit ialah $1,000 di mana kos berubah ialah $840 seunit, dan purata kos seunit untuk 5,000 unit jualan masa kini ialah $890.

Sekiranya pulangan dikehendaki ke atas pelaburan ialah 10%, pertimbangkan dan beri pandangan mengenai pengurangan syarat jualan kredit ini kepada syarikat.

(10 markah)

5. Syarikat Karban menganggar aliran tunai bersih setiap penggal yang berikut untuk dua tahun hadapan. (Jumlah dalam ribu ringgit).

Penggal	1988 Jumlah	1989 Jumlah
1	$ 1.2	$ 1.7
2	$ 2.1	$ 1.6
3	$(2.7)	$(3.6)
4	$(1.9)	$(1.0)

Syarikat memulakan 1988 dengan $1.5 ribu aset cair.

(a) Apakah jumlah baki aset cair setiap akhir penggal sekiranya tiada pembiayaan luar?

(b) Berapakah jumlah pembiayaan sementara dan pembiayaan tetap yang diperlukan oleh syarikat sekiranya ia ingin mempunyai baki aset cair sekurang-kurangnya $1.5 ribu untuk tempoh 2 tahun tersebut? (Andaikan pembiayaan tetap ditentukan pada setiap akhir tahun).

(10 markah)

BAHAGIAN B

6. Apakah perkaitan antara keputusan kewangan dan risiko dan pulangan? Adakah semua pengurus kewangan mempunyai pandangan sama mengenai pertukaran (trade-off) antara risiko dan pulangan?

(10 markah)

7. (a) Bagaimanakah nilai tara bon berbeza daripada nilai pasarannya?

(b) Terangkan perbezaan antara kadar faedah kupon dan kadar dikehendaki bagi pemegang bon.

(10 markah)

8. Sekiranya firma membiayai aset semasanya dengan dana jangka panjang, apakah kesan keputusan ini ke atas keuntungan dan risiko firma? Bincangkan.

(10 markah)

9. Apakah yang dimaksudkan dengan struktur tempoh kadar faedah dan bagaimanakah kaitannya dengan kelok hasil? Untuk sesuatu jenis sekuriti, apakah jangkaan yang menyebabkan kelok hasil menurun, mendaki dan rata?

(10 markah)

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%	25%	30%	35%
1	1.010	1.020	1.030	1.040	1.050	1.060	1.070	1.080	1.090	1.100	1.110	1.120	1.130	1.140	1.150	1.160	1.200	1.250	1.300	1.350
2	1.020	1.040	1.061	1.082	1.102	1.124	1.145	1.166	1.188	1.210	1.232	1.254	1.277	1.300	1.322	1.346	1.440	1.562	1.690	1.822
3	1.030	1.061	1.093	1.125	1.158	1.191	1.225	1.260	1.295	1.331	1.368	1.405	1.443	1.482	1.521	1.561	1.728	1.953	2.197	2.460
4	1.041	1.082	1.126	1.170	1.216	1.262	1.311	1.360	1.412	1.464	1.518	1.574	1.630	1.689	1.749	1.811	2.074	2.441	2.856	3.321
5	1.051	1.104	1.159	1.217	1.276	1.338	1.403	1.469	1.539	1.611	1.685	1.762	1.842	1.925	2.011	2.100	2.488	3.052	3.713	4.484
6	1.062	1.126	1.194	1.265	1.340	1.419	1.501	1.587	1.677	1.772	1.870	1.974	2.082	2.195	2.313	2.436	2.986	3.815	4.827	6.053
7	1.072	1.149	1.230	1.316	1.407	1.504	1.606	1.714	1.828	1.949	2.076	2.211	2.353	2.502	2.660	2.826	3.583	4.768	6.275	8.172
8	1.083	1.172	1.267	1.369	1.477	1.594	1.718	1.851	1.993	2.144	2.305	2.476	2.658	2.853	3.059	3.278	4.300	5.960	8.157	11.032
9	1.094	1.195	1.305	1.423	1.551	1.689	1.838	1.999	2.172	2.358	2.558	2.773	3.004	3.252	3.518	3.803	5.160	7.451	10.604	14.894
10	1.105	1.219	1.344	1.480	1.629	1.791	1.967	2.159	2.367	2.594	2.839	3.106	3.395	3.707	4.046	4.411	6.192	9.313	13.786	20.106
11	1.116	1.243	1.384	1.539	1.710	1.898	2.105	2.332	2.580	2.853	3.152	3.479	3.836	4.226	4.652	5.117	7.430	11.642	17.921	27.144
12	1.127	1.268	1.426	1.601	1.796	2.012	2.252	2.518	2.813	3.138	3.498	3.896	4.334	4.818	5.350	5.936	8.916	14.552	23.298	36.644
13	1.138	1.294	1.469	1.665	1.886	2.133	2.410	2.720	3.066	3.452	3.883	4.363	4.898	5.492	6.153	6.886	10.699	18.190	30.287	49.469
14	1.149	1.319	1.513	1.732	1.980	2.261	2.579	2.937	3.342	3.797	4.310	4.887	5.535	6.261	7.076	7.987	12.839	22.737	39.373	66.784
15	1.161	1.346	1.558	1.801	2.079	2.397	2.759	3.172	3.642	4.177	4.785	5.474	6.254	7.138	8.137	9.265	15.407	28.422	51.185	90.158
16	1.173	1.373	1.605	1.873	2.183	2.540	2.952	3.426	3.970	4.595	5.311	6.130	7.067	8.137	9.358	10.748	18.488	35.527	66.541	121.71
17	1.184	1.400	1.653	1.948	2.292	2.693	3.159	3.700	4.328	5.054	5.895	6.866	7.986	9.276	10.761	12.468	22.186	44.409	86.503	164.31
18	1.196	1.428	1.702	2.026	2.407	2.854	3.380	3.996	4.717	5.560	6.543	7.690	9.024	10.575	12.375	14.462	26.623	55.511	112.45	221.82
19	1.208	1.457	1.753	2.107	2.527	3.026	3.616	4.316	5.142	6.116	7.263	8.613	10.197	12.055	14.232	16.776	31.948	69.389	146.19	299.46
20	1.220	1.486	1.806	2.191	2.653	3.207	3.870	4.661	5.604	6.727	8.062	9.646	11.523	13.743	16.366	19.461	38.337	86.736	190.05	404.27
21	1.232	1.516	1.860	2.279	2.786	3.399	4.140	5.034	6.109	7.400	8.949	10.804	13.021	15.667	18.821	22.574	46.005	108.42	247.06	545.76
22	1.245	1.546	1.916	2.370	2.925	3.603	4.430	5.436	6.658	8.140	9.933	12.100	14.713	17.861	21.644	26.186	55.205	135.53	321.18	736.78
23	1.257	1.577	1.974	2.465	3.071	3.820	4.740	5.871	7.258	8.954	11.026	13.552	16.626	20.361	24.891	30.376	66.247	169.41	417.53	994.65
24	1.270	1.608	2.033	2.563	3.225	4.049	5.072	6.341	7.911	9.850	12.239	15.178	18.788	23.212	28.625	35.236	79.496	211.76	542.79	1342.8
25	1.282	1.641	2.094	2.666	3.386	4.292	5.427	6.848	8.623	10.834	13.585	17.000	21.230	26.461	32.918	40.874	95.395	264.70	705.63	1812.8
30	1.348	1.811	2.427	3.243	4.322	5.743	7.612	10.062	13.267	17.449	22.892	29.960	39.115	50.949	66.210	85.849	237.37	807.79	2619.9	8128.4
35	1.417	2.000	2.814	3.946	5.516	7.686	10.676	14.785	20.413	28.102	38.574	52.799	72.066	98.097	133.17	180.31	590.66	2465.2	9727.6	36448.
40	1.489	2.208	3.262	4.801	7.040	10.285	14.974	21.724	31.408	45.258	64.999	93.049	132.78	188.88	267.86	378.72	1469.7	7523.2	36118.	*
45	1.565	2.438	3.781	5.841	8.985	13.765	21.002	31.920	48.325	72.888	109.53	163.99	244.63	363.66	538.75	795.43	3657.2	22959.	*	*
50	1.645	2.691	4.384	7.106	11.467	18.419	29.456	46.900	74.354	117.39	184.56	289.00	450.71	700.20	1083.6	1670.7	9100.2	70065.	*	*

*FVIF > 99,999.

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

Period	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%	14%	15%	16%	20%	25%	30%	35%
1	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2	2.010	2.020	2.030	2.040	2.050	2.060	2.070	2.080	2.090	2.100	2.110	2.120	2.130	2.140	2.150	2.160	2.200	2.250	2.300	2.350
3	3.030	3.060	3.091	3.122	3.152	3.184	3.215	3.246	3.278	3.310	3.342	3.374	3.407	3.440	3.472	3.506	3.640	3.813	3.990	4.172
4	4.060	4.122	4.184	4.246	4.310	4.375	4.440	4.506	4.573	4.641	4.710	4.779	4.850	4.921	4.993	5.066	5.368	5.766	6.187	6.633
5	5.101	5.204	5.309	5.416	5.526	5.637	5.751	5.867	5.985	6.105	6.228	6.353	6.480	6.610	6.742	6.877	7.442	8.207	9.043	9.954
6	6.152	6.308	6.468	6.633	6.802	6.975	7.153	7.336	7.523	7.716	7.913	8.115	8.323	8.535	8.754	8.977	9.930	11.259	12.756	14.438
7	7.214	7.434	7.662	7.898	8.142	8.394	8.654	8.923	9.200	9.487	9.783	10.089	10.405	10.730	11.067	11.414	12.916	15.073	17.583	20.492
8	8.286	8.583	8.892	9.214	9.549	9.897	10.260	10.637	11.028	11.436	11.859	12.300	12.757	13.233	13.727	14.240	16.499	19.842	23.858	28.664
9	9.368	9.755	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	17.518	20.799	25.802	32.015	39.696
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	33.253	42.619	54.590
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	23.044	24.349	25.733	32.150	42.566	56.405	74.696
12	12.682	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	29.001	30.850	39.580	54.208	74.326	101.84
13	13.809	14.680	15.618	16.627	17.713	18.882	20.141	21.495	22.953	24.523	26.211	28.029	29.984	32.088	34.352	36.786	48.496	68.760	97.624	138.48
14	14.947	15.974	17.086	18.292	19.598	21.015	22.550	24.215	26.019	27.975	30.095	32.392	34.882	37.581	40.504	43.672	59.196	86.949	127.91	187.95
15	16.097	17.293	18.599	20.023	21.578	23.276	25.129	27.152	29.361	31.772	34.405	37.280	40.417	43.842	47.580	51.659	72.035	109.69	167.29	254.74
16	17.258	18.639	20.157	21.824	23.657	25.672	27.888	30.324	33.003	35.949	39.190	42.753	46.671	50.980	55.717	60.925	87.442	138.11	218.47	344.90
17	18.430	20.012	21.761	23.697	25.840	28.213	30.840	33.750	36.973	40.544	44.500	48.883	53.738	59.117	65.075	71.673	105.93	173.64	285.01	466.61
18	19.614	21.412	23.414	25.645	28.132	30.905	33.999	37.450	41.301	45.599	50.396	55.749	61.724	68.393	75.836	84.140	128.12	218.05	371.51	630.92
19	20.811	22.840	25.117	27.671	30.539	33.760	37.379	41.446	46.018	51.158	56.939	63.439	70.748	78.968	88.211	98.603	154.74	273.56	483.97	852.74
20	22.019	24.297	26.870	29.778	33.066	36.785	40.995	45.762	51.159	57.274	64.202	72.052	80.946	91.024	102.44	115.38	186.69	342.95	630.16	1152.2
21	23.239	25.783	28.676	31.969	35.719	39.992	44.865	50.422	56.764	64.002	72.264	81.698	92.468	104.77	118.81	134.84	225.02	429.68	820.20	1556.5
22	24.471	27.299	30.536	34.248	38.505	43.392	49.005	55.456	62.872	71.402	81.213	92.502	105.49	120.43	137.63	157.41	271.03	538.10	1067.3	2102.2
23	25.716	28.845	32.452	36.618	41.430	46.995	53.435	60.893	69.531	79.542	91.147	104.60	120.20	138.30	159.27	183.60	326.23	673.63	1388.4	2839.0
24	26.973	30.421	34.426	39.082	44.501	50.815	58.176	66.764	76.789	88.496	102.17	118.15	136.83	158.66	184.17	213.98	392.48	843.03	1806.0	3833.7
25	28.243	32.030	36.459	41.645	47.726	54.864	63.248	73.105	84.699	98.346	114.41	133.33	155.62	181.87	212.79	249.21	471.98	1054.8	2348.8	5176.4
30	34.784	40.567	47.575	56.084	66.438	79.057	94.459	113.28	136.31	164.49	199.02	241.33	293.19	356.78	434.74	530.31	1181.9	3227.2	8729.8	23221.
35	41.659	49.994	60.461	73.651	90.318	111.43	138.23	172.31	215.71	271.02	341.58	431.66	546.66	693.55	881.15	1120.7	2948.3	9856.7	32422.	*
40	48.885	60.401	75.400	95.024	120.80	154.76	199.63	259.05	337.87	442.58	581.81	767.08	1013.7	1342.0	1779.0	2360.7	7343.7	30089	*	*
45	56.479	71.891	92.718	121.03	159.70	212.74	285.74	386.50	525.84	718.88	986.61	1358.2	1874.1	2590.5	3585.0	4965.2	18281.	91831.	*	*
50	64.461	84.577	112.79	152.66	209.34	290.33	406.52	573.76	815.05	1163.9	1668.7	2400.0	3459.3	4994.3	7217.5	10435.	45496.	*	*	*

*FVIFA > 99,999.

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%	17%	18%	19%	20%	25%	30%	35%
1	.990	.980	.971	.962	.952	.943	.935	.926	.917	.909	.901	.893	.885	.877	.870	.862	.855	.847	.840	.833	.800	.769	.741
2	.980	.961	.943	.925	.907	.890	.873	.857	.842	.826	.812	.797	.783	.769	.756	.743	.731	.718	.706	.694	.640	.592	.549
3	.971	.942	.915	.889	.864	.840	.816	.794	.772	.751	.731	.712	.693	.675	.658	.641	.624	.609	.593	.579	.512	.455	.406
4	.961	.924	.888	.855	.823	.792	.763	.735	.708	.683	.659	.636	.613	.592	.572	.552	.534	.516	.499	.482	.410	.350	.301
5	.951	.906	.863	.822	.784	.747	.713	.681	.650	.621	.593	.567	.543	.519	.497	.476	.456	.437	.419	.402	.328	.269	.223
6	.942	.888	.837	.790	.746	.705	.666	.630	.596	.564	.535	.507	.480	.456	.432	.410	.390	.370	.352	.335	.262	.207	.165
7	.933	.871	.813	.760	.711	.665	.623	.583	.547	.513	.482	.452	.425	.400	.376	.354	.333	.314	.296	.279	.210	.159	.122
8	.923	.853	.789	.731	.677	.627	.582	.540	.502	.467	.434	.404	.376	.351	.327	.305	.285	.266	.249	.233	.168	.123	.091
9	.914	.837	.766	.703	.645	.592	.544	.500	.460	.424	.391	.361	.333	.308	.284	.263	.243	.225	.209	.194	.134	.094	.067
10	.905	.820	.744	.676	.614	.558	.508	.463	.422	.386	.352	.322	.295	.270	.247	.227	.208	.191	.176	.162	.107	.073	.050
11	.896	.804	.722	.650	.585	.527	.475	.429	.388	.350	.317	.287	.261	.237	.215	.195	.178	.162	.148	.135	.086	.056	.037
12	.887	.789	.701	.625	.557	.497	.444	.397	.356	.319	.286	.257	.231	.208	.187	.168	.152	.137	.124	.112	.069	.043	.027
13	.879	.773	.681	.601	.530	.469	.415	.368	.326	.290	.258	.229	.204	.182	.163	.145	.130	.116	.104	.093	.055	.033	.020
14	.870	.758	.661	.577	.505	.442	.388	.340	.299	.263	.232	.205	.181	.160	.141	.125	.111	.099	.088	.078	.044	.025	.015
15	.861	.743	.642	.555	.481	.417	.362	.315	.275	.239	.209	.183	.160	.140	.123	.108	.095	.084	.074	.065	.035	.020	.011
16	.853	.728	.623	.534	.458	.394	.339	.292	.252	.218	.188	.163	.141	.123	.107	.093	.081	.071	.062	.054	.028	.015	.008
17	.844	.714	.605	.513	.436	.371	.317	.270	.231	.198	.170	.146	.125	.108	.093	.080	.069	.060	.052	.045	.023	.012	.006
18	.836	.700	.587	.494	.416	.350	.296	.250	.212	.180	.153	.130	.111	.095	.081	.069	.059	.051	.044	.038	.018	.009	.005
19	.828	.686	.570	.475	.396	.331	.277	.232	.194	.164	.138	.116	.098	.083	.070	.060	.051	.043	.037	.031	.014	.007	.003
20	.820	.673	.554	.456	.377	.312	.258	.215	.178	.149	.124	.104	.087	.073	.061	.051	.043	.037	.031	.026	.012	.005	.002
21	.811	.660	.538	.439	.359	.294	.242	.199	.164	.135	.112	.093	.077	.064	.053	.044	.037	.031	.026	.022	.009	.004	.002
22	.803	.647	.522	.422	.342	.278	.226	.184	.150	.123	.101	.083	.068	.056	.046	.038	.032	.026	.022	.018	.007	.003	.001
23	.795	.634	.507	.406	.326	.262	.211	.170	.138	.112	.091	.074	.060	.049	.040	.033	.027	.022	.018	.015	.006	.002	.001
24	.788	.622	.492	.390	.310	.247	.197	.158	.126	.102	.082	.066	.053	.043	.035	.028	.023	.019	.015	.013	.005	.002	.001
25	.780	.610	.478	.375	.295	.233	.184	.146	.116	.092	.074	.059	.047	.038	.030	.024	.020	.016	.013	.010	.004	.001	.001
30	.742	.552	.412	.308	.231	.174	.131	.099	.075	.057	.044	.033	.026	.020	.015	.012	.009	.007	.005	.004	.001	*	*
35	.706	.500	.355	.253	.181	.130	.094	.068	.049	.036	.026	.019	.014	.010	.008	.006	.004	.003	.002	.002	*	*	*
40	.672	.453	.307	.208	.142	.097	.067	.046	.032	.022	.015	.011	.008	.005	.004	.003	.002	.001	.001	.001	*	*	*
45	.639	.410	.264	.171	.111	.073	.048	.031	.021	.014	.009	.006	.004	.003	.002	.001	.001	.001	*	*	*	*	*
50	.608	.372	.228	.141	.087	.054	.034	.021	.013	.009	.005	.003	.002	.001	.001	.001	*	*	*	*	*	*	*

*PVIF = .000 when rounded to three decimal places

Table A-4
Present-Value Interest Factors for a One-Dollar Annuity Discounted at k Percent for n Periods: $PVIFA_{k,n} = \sum_{t=1}^{n} 1/(1 + k)^t$

Period	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%	14%	15%	16%	17%	18%	19%	20%	25%	30%	35%
1	.990	.980	.971	.962	.952	.943	.935	.926	.917	.909	.901	.893	.885	.877	.870	.862	.855	.847	.840	.833	.800	.769	.741
2	1.970	1.942	1.913	1.886	1.859	1.833	1.808	1.783	1.759	1.736	1.713	1.690	1.668	1.647	1.626	1.605	1.585	1.566	1.547	1.528	1.440	1.361	1.289
3	2.941	2.884	2.829	2.775	2.723	2.673	2.624	2.577	2.531	2.487	2.444	2.402	2.361	2.322	2.283	2.246	2.210	2.174	2.140	2.106	1.952	1.816	1.696
4	3.902	3.808	3.717	3.630	3.546	3.465	3.387	3.312	3.240	3.170	3.102	3.037	2.974	2.914	2.855	2.798	2.743	2.690	2.639	2.589	2.362	2.166	1.997
5	4.853	4.713	4.580	4.452	4.329	4.212	4.100	3.993	3.890	3.791	3.696	3.605	3.517	3.433	3.352	3.274	3.199	3.127	3.058	2.991	2.689	2.436	2.220
6	5.795	5.601	5.417	5.242	5.076	4.917	4.767	4.623	4.486	4.355	4.231	4.111	3.998	3.889	3.784	3.685	3.589	3.498	3.410	3.326	2.951	2.643	2.385
7	6.728	6.472	6.230	6.002	5.786	5.582	5.389	5.206	5.033	4.868	4.712	4.564	4.423	4.288	4.160	4.039	3.922	3.812	3.706	3.605	3.161	2.802	2.508
8	7.652	7.326	7.020	6.733	6.463	6.210	5.971	5.747	5.535	5.335	5.146	4.968	4.799	4.639	4.487	4.344	4.207	4.078	3.954	3.837	3.329	2.925	2.598
9	8.566	8.162	7.786	7.435	7.108	6.802	6.515	6.247	5.995	5.759	5.537	5.328	5.132	4.946	4.772	4.607	4.451	4.303	4.163	4.031	3.463	3.019	2.665
10	9.471	8.983	8.530	8.111	7.722	7.360	7.024	6.710	6.418	6.145	5.889	5.650	5.426	5.216	5.019	4.833	4.659	4.494	4.339	4.192	3.570	3.092	2.715
11	10.368	9.787	9.253	8.760	8.306	7.887	7.499	7.139	6.805	6.495	6.207	5.938	5.687	5.453	5.234	5.029	4.836	4.656	4.486	4.327	3.656	3.147	2.752
12	11.255	10.575	9.954	9.385	8.863	8.384	7.943	7.536	7.161	6.814	6.492	6.194	5.918	5.660	5.421	5.197	4.988	4.793	4.611	4.439	3.725	3.190	2.779
13	12.134	11.348	10.635	9.986	9.394	8.853	8.358	7.904	7.487	7.013	6.750	6.424	6.122	5.842	5.583	5.342	5.118	4.910	4.715	4.533	3.780	3.223	2.799
14	13.004	12.106	11.296	10.563	9.899	9.295	8.745	8.244	7.786	7.367	6.982	6.628	6.302	6.002	5.724	5.468	5.229	5.008	4.802	4.611	3.824	3.249	2.814
15	13.865	12.849	11.938	11.118	10.380	9.712	9.108	8.560	8.061	7.606	7.191	6.811	6.462	6.142	5.847	5.575	5.324	5.092	4.876	4.675	3.859	3.268	2.825
16	14.718	13.578	12.561	11.652	10.838	10.106	9.447	8.851	8.313	7.824	7.379	6.974	6.604	6.265	5.954	5.668	5.405	5.162	4.938	4.730	3.887	3.283	2.834
17	15.562	14.292	13.166	12.166	11.274	10.477	9.763	9.122	8.544	8.022	7.549	7.120	6.729	6.373	6.047	5.749	5.475	5.222	4.990	4.775	3.910	3.295	2.840
18	16.398	14.992	13.754	12.659	11.690	10.828	10.059	9.372	8.756	8.201	7.702	7.250	6.840	6.467	6.128	5.818	5.534	5.273	5.033	4.812	3.928	3.304	2.844
19	17.226	15.679	14.324	13.134	12.085	11.158	10.336	9.604	8.950	8.365	7.839	7.366	6.938	6.550	6.198	5.877	5.584	5.316	5.070	4.843	3.942	3.311	2.848
20	18.046	16.352	14.878	13.590	12.462	11.470	10.594	9.818	9.129	8.514	7.963	7.469	7.025	6.623	6.259	5.929	5.628	5.353	5.101	4.870	3.954	3.316	2.850
21	18.857	17.011	15.415	14.029	12.821	11.764	10.836	10.017	9.292	8.649	8.075	7.562	7.102	6.687	6.312	5.973	5.665	5.384	5.127	4.891	3.963	3.320	2.852
22	19.661	17.658	15.937	14.451	13.163	12.042	11.061	10.201	9.442	8.772	8.176	7.645	7.170	6.743	6.359	6.011	5.696	5.410	5.149	4.909	3.970	3.323	2.853
23	20.456	18.292	16.444	14.857	13.489	12.303	11.272	10.371	9.580	8.883	8.266	7.718	7.230	6.792	6.399	6.044	5.723	5.432	5.167	4.925	3.976	3.325	2.854
24	21.244	18.914	16.936	15.247	13.799	12.550	11.469	10.529	9.707	8.985	8.348	7.784	7.283	6.835	6.434	6.073	5.746	5.451	5.182	4.937	3.981	3.327	2.855
25	22.023	19.524	17.413	15.622	14.094	12.783	11.654	10.675	9.823	9.077	8.422	7.843	7.330	6.873	6.464	6.097	5.766	5.467	5.195	4.948	3.985	3.329	2.856
30	25.808	22.396	19.601	17.292	15.373	13.765	12.409	11.258	10.274	9.427	8.694	8.055	7.496	7.003	6.566	6.177	5.829	5.517	5.235	4.979	3.995	3.332	2.857
35	29.409	24.999	21.487	18.665	16.374	14.498	12.948	11.655	10.567	9.644	8.855	8.176	7.586	7.070	6.617	6.215	5.858	5.539	5.251	4.992	3.998	3.333	2.857
40	32.835	27.356	23.115	19.793	17.159	15.046	13.332	11.925	10.757	9.779	8.951	8.244	7.634	7.105	6.642	6.233	5.871	5.548	5.258	4.997	3.999	3.333	2.857
45	36.095	29.490	24.519	20.720	17.774	15.456	13.606	12.108	10.881	9.863	9.008	8.283	7.661	7.123	6.654	6.242	5.877	5.552	5.261	4.999	4.000	3.333	2.857
50	39.196	31.424	25.730	21.482	18.256	15.762	13.801	12.233	10.962	9.915	9.042	8.304	7.675	7.133	6.661	6.246	5.880	5.554	5.262	4.999	4.000	3.333	2.857

--oooo000oooo--