

UNIVERSITY OF SWAZILAND
DEPARTMENT OF ACCOUNTING
MAIN EXAMINATION QUESTION PAPER

DEGREE/YEAR OF STUDY : B COMM V
TITLE OF PAPER : CORPORATE FINANCE 11
COURSE CODE : AC 503
TIME ALLOWED : THREE (3) HOURS
INSTRUCTIONS

1. TOTAL NUMBER OF QUESTIONS ON THIS PAPER: FOUR (4)
2. ANSWER ALL QUESTIONS
3. WHERE APPLICABLE ALL WORKINGS SHOULD BE SHOWN
4. ALL CALCULATIONS ARE TO BE MADE TO THE NEAREST LILANGENI.

NOTE: YOU ARE REMINDED THAT IN ASSESSING YOUR WORK, ACCOUNT WILL BE TAKEN OF ACCURACY OF THE LANGUAGE AND THE GENERAL QUALITY OF EXPRESSION, TOGETHER WITH THE LAYOUT AND PRESENTATION OF YOUR FINAL ANSWER.

SPECIAL REQUIREMENT: PV TABLES

THIS PAPER IS NOT TO BE OPENED UNTIL PERMISSION HAS BEEN GRANTED BY THE INVIGILATOR.

QUESTION 1

The AG Company is financed using the following methods:

(1) Equity. The company has 20 million shares, which are trading at E3.70 per share. It has an equity beta of 1.15.

(2) Preference shares. The company has ten million E1, seven per cent preference shares, which are trading at E0.91.

(3) Debt. AG has E30m, par value (E100) of eight per cent debentures, which are redeemable at par in six years' time. The debentures are trading at E101.

The return on the market is 11 per cent, the return on government stock is 5 per cent and the corporate tax rate is 30 per cent.

Required:

Calculate the WACC of the AG Company using market values. *(25marks)*

QUESTION 2

Clearly illustrate, by way of graphs, the capital structure approaches and explain the relationship between firm value and cost of capital.

(a) In the graphs, plot required rate of return on the vertical axis and debt/equity ratio on the horizontal axis. Use the graphs to show the WACC, Cost of debt and the cost of equity of a firm under:

(i) Net Income View *(5 marks)*

(ii) Net operating Income View and *(5 marks)*

(iii) M&M with taxes (illustrate using value of the firm on the vertical axis, debt/equity ratio on the horizontal axis and show the value of a leveraged and unleveraged firm.) *(5 marks)*

(b) Explain (in about a page) what the three graphs tell us about firm value and its cost of capital under the three different theories. *(10 marks)*

QUESTION 3

Head Ltd is considering acquiring Deputy Ltd. The owners of Deputy Ltd. have supplied Head Ltd. with the following balance sheet data to help in the valuation process.

Deputy Ltd.

Balance sheet as at 31 December 2009.

	E
Assets	
Land and Building	5,000,000
Plant and Machinery	12,000,000
Investment	2,000,000
Goodwill	<u>500,000</u>
Total	19,500,000
Current Assets	
Cash	60,000
Debtors	5,000,000
Stock	2,500,000
	<u>7,560,000</u>
Current Liabilities	
Creditors	3,600,000
Bank Overdraft	1,250,000
	<u>4,850,000</u>
Net working capital	2,710,000
Total	22,210,000
Equity and Liabilities	
Ordinary Shares (E0.50)	4,000,000
Reserves	9,500,000
15% Preference Shares	2,210,000
12% Debentures	6,500,000
Total	22,210,000

Additional Information

- (i) The land and buildings can be rented at a current rental value of E1.6 million per annum in perpetuity. The required rate of return on such property is 18%.
- (ii) The plant and machinery can only be liquidated at a price of E10 million but have a replacement value of E20 million.
- (iii) The debentures are irredeemable, have a par value of E100, and their current required rate of return is 20%.
- (iv) Preference shares are trading at 75cents and have a par value of E1.00.
- (v) The firms investments are for speculative reasons and have a current market value of E1.35 million
- (vi) E500 000 worth of debtors are thought to be irrecoverable.
- (vii) A stock check revealed that the stock is actually worth E2 250 000.
- (viii) The bank would still advance the overdraft in case of a take-over.

Required

Calculate the value of Deputy Ltd. using the net asset value method. *(25 marks)*

QUESTION 4

KK Equipment, a Swaziland based company, is evaluating an overseas investment. KK's exports of drill bits have increased to such an extent that it is considering building a distribution centre in France. The project will cost €2 million to launch. The cashflows are expected to be €9 million a year for the next three years. The current spot exchange rate for the euros is E1 / €0.5. The risk free rate in Swaziland is 5%, and the risk free rate in 'euroland' is 7%. KK's required return on investments of this sort is 10%.

Required:

Should KK Equipment take this investment? Support your answer by calculating the NPV of the project using:

- (a) The home currency approach
- (b) The foreign currency approach

(25 marks)

End of Question Paper

B. FINANCIAL TABLES

Table 1: Future Value Interest Factor $(1 + r)^n$

Periods	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%	14%
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
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
3	1.0303	1.0612	1.0927	1.1249	1.1576	1.1910	1.2250	1.2597	1.2950	1.3310	1.3678	1.4049	1.4429	1.4815
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
5	1.0510	1.1041	1.1593	1.2167	1.2763	1.3382	1.4028	1.4693	1.5378	1.6085	1.6814	1.7567	1.8344	1.9145
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
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	2.3528	2.5023
8	1.0829	1.1717	1.2668	1.3688	1.4775	1.5938	1.7182	1.8509	1.9928	2.1436	2.3045	2.4760	2.6584	2.8526
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
10	1.1046	1.2190	1.3439	1.4802	1.6289	1.7908	1.9672	2.1689	2.3974	2.6537	2.9384	3.2528	3.5984	3.9772
11	1.1157	1.2434	1.3842	1.5395	1.7103	1.8983	2.1049	2.3316	2.5804	2.8531	3.1518	3.4765	3.8359	4.2262
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
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
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
15	1.1610	1.3459	1.5580	1.8009	2.0789	2.3966	2.7590	3.1722	3.6425	4.1772	4.7846	5.4738	6.2543	7.1379
16	1.1726	1.3728	1.6047	1.8730	2.1829	2.5404	2.9522	3.4259	3.8703	4.5950	5.3109	6.1304	7.0673	8.1372
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
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	10.5752
19	1.2081	1.4568	1.7535	2.1068	2.5270	3.0256	3.6185	4.3157	5.1417	6.1159	7.2633	8.6128	10.1974	12.0557
20	1.2202	1.4859	1.8061	2.1911	2.6533	3.2071	3.8697	4.6610	5.6044	6.7275	8.0823	9.6463	11.5231	13.7436
25	1.2824	1.6406	2.0938	2.6658	3.3864	4.2919	5.4274	6.8485	8.6231	10.8347	13.5855	17.0001	21.2305	26.4619
30	1.3478	1.8114	2.4273	3.2434	4.3219	5.7435	7.6123	10.0627	13.2677	17.4494	22.8923	29.9599	39.1159	50.9502
35	1.4166	1.9999	2.8139	3.9461	5.5160	7.6861	10.6766	14.7853	20.4140	28.1024	38.5749	52.7996	72.0685	98.1002
40	1.4889	2.2080	3.2620	4.8010	7.0400	10.2857	14.9745	21.7245	31.4094	45.2593	65.0009	93.0510	132.7816	188.8635
50	1.6446	2.6916	4.3839	7.1067	11.4674	18.4202	29.4570	46.9016	74.3575	117.3909	184.5648	289.0022	450.7359	700.2330

Periods	16%	16%	17%	18%	19%	20%	22%	24%	26%	26%	28%	30%	32%	36%
1	1.1500	1.1600	1.1700	1.1800	1.1900	1.2000	1.2200	1.2400	1.2500	1.2600	1.2800	1.3000	1.3200	1.3600
2	1.3225	1.3456	1.3689	1.3924	1.4161	1.4400	1.4884	1.5376	1.5625	1.5876	1.6384	1.6900	1.7424	1.8496
3	1.5209	1.5609	1.6016	1.6430	1.6852	1.7280	1.8158	1.9066	1.9531	2.0004	2.0972	2.1970	2.3000	2.5155
4	1.7490	1.8106	1.8739	1.9388	2.0053	2.0736	2.2153	2.3642	2.4414	2.5205	2.6844	2.8561	3.0360	3.4210
5	2.0114	2.1003	2.1924	2.2878	2.3864	2.4883	2.7027	2.9316	3.0518	3.1758	3.4360	3.7129	4.0075	4.6526
6	2.3131	2.4364	2.5652	2.6996	2.8398	2.9860	3.2973	3.6352	3.8147	4.0015	4.3980	4.8268	5.2899	6.3275
7	2.6600	2.8262	3.0012	3.1855	3.3793	3.5832	4.0227	4.5077	4.7684	5.0419	5.6295	6.2749	6.9826	8.6054
8	3.0590	3.2784	3.5115	3.7589	4.0214	4.2998	4.9077	5.5895	5.9605	6.3528	7.2058	8.1573	9.2170	11.7034
9	3.5179	3.8030	4.1084	4.4355	4.7854	5.1598	5.9874	6.9310	7.4506	8.0045	9.2234	10.6045	12.1665	15.9166
10	4.0456	4.4114	4.8068	5.2338	5.6947	6.1917	7.3048	8.5944	9.3132	10.0857	11.8059	13.7858	16.0588	21.6466
11	4.6524	5.1173	5.6240	6.1759	6.7767	7.4301	8.9117	10.6571	11.6415	12.7080	15.1116	17.9216	21.1989	29.4393
12	5.3503	5.9360	6.5801	7.2876	8.0642	8.9161	10.8722	13.2148	14.5519	16.0120	19.3428	23.2981	27.9825	40.0375
13	6.1528	6.8858	7.6987	8.5994	9.5964	10.6993	13.2641	16.3863	18.1899	20.1752	24.7588	30.2875	36.9370	54.4510
14	7.0757	7.9675	9.0075	10.1472	11.4198	12.8392	16.1822	20.3191	22.7374	25.4207	31.6913	39.3738	48.7568	74.0534
15	8.1371	9.2655	10.5387	11.9737	13.5895	15.4070	19.7423	25.1956	28.4217	32.0301	40.5648	51.1858	64.3590	100.7126
16	9.3576	10.7480	12.3303	14.1290	16.1715	18.4684	24.0856	31.2426	35.5271	40.3579	51.9230	66.5417	84.9538	136.9691
17	10.7613	12.4677	14.4265	16.6722	19.2441	22.1861	29.3844	38.7408	44.4089	50.8510	66.4614	86.5042	112.1390	186.2779
18	12.3755	14.4625	16.8790	19.6733	22.9005	26.6233	35.8490	48.0386	55.5112	64.0722	85.0706	112.4554	148.0235	253.3380
19	14.2318	16.7765	19.7484	23.2144	27.2516	31.9480	43.7358	59.5679	69.3889	80.7310	108.8904	146.1920	195.3911	344.5397
20	16.3665	19.4608	23.1056	27.3930	32.4294	38.3376	53.3576	73.8641	86.7362	101.7211	139.3797	190.0496	257.9162	468.5740
25	32.9190	40.8742	50.6578	62.6686	77.3881	95.3962	144.2101	216.5420	264.6978	323.0454	478.9049	705.6410	1033.590	2180.081
30	66.2118	85.8499	111.0647	143.3706	184.6753	237.3763	389.7579	634.8199	807.7936	1025.927	1645.505	2619.996	4142.075	10143.02
35	133.1755	180.3141	243.5035	327.9973	440.7006	590.6682	1053.402	1861.054	2465.190	3258.135	5653.911	9727.860	16599.22	47191.26
40	267.8635	378.7212	533.8687	750.3783	1051.668	1469.772	2847.038	5455.913	7523.164	10347.18	19426.69	36118.86	66520.77	219561.6
50	1083.657	1670.704	2586.215	3927.357	5988.914	9100.438	20796.56	48890.43	70064.92	104358.4	229349.9	497929.2	1068308.2	4752754.9

Table 2: Future Value Interest Factor Annuity

Periods	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%	14%
1	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
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
3	3.0301	3.0604	3.0909	3.1216	3.1525	3.1838	3.2149	3.2464	3.2781	3.3100	3.3421	3.3744	3.4069	3.4396
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
5	5.1010	5.2040	5.3091	5.4163	5.5258	5.6371	5.7507	5.8668	5.9847	6.1051	6.2279	6.3528	6.4803	6.6101
6	6.1520	6.3081	6.4684	6.6330	6.8019	6.9753	7.1533	7.3359	7.5233	7.7158	7.9129	8.1152	8.3227	8.5355
7	7.2135	7.4343	7.6625	7.8983	8.1420	8.3938	8.6540	8.9228	9.2004	9.4872	9.7833	10.0890	10.4047	10.7305
8	8.2857	8.5830	8.8923	9.2142	9.5491	9.8975	10.2598	10.6368	11.0285	11.4359	11.8594	12.2997	12.7573	13.2328
9	9.3685	9.7546	10.1591	10.5828	11.0266	11.4913	11.9780	12.4876	13.0210	13.5795	14.1640	14.7757	15.4157	16.0853
10	10.4622	10.9497	11.4639	12.0061	12.5779	13.1808	13.8164	14.4868	15.1929	15.9374	16.7220	17.5487	18.4197	19.3373
11	11.5688	12.1687	12.8078	13.4864	14.2068	14.9718	15.7838	16.6455	17.5603	18.5312	19.5614	20.6546	21.8143	23.0445
12	12.6825	13.4121	14.1820	15.0258	15.9171	16.8699	17.8885	18.9771	20.1407	21.3843	22.7132	24.1331	25.6502	27.2707
13	13.8093	14.6803	15.6178	16.6268	17.7130	18.8821	20.1406	21.4933	22.9534	24.5227	26.2116	28.0291	29.9847	32.0887
14	14.9474	15.9739	17.0863	18.2919	19.5986	21.0151	22.5505	24.2149	26.0182	27.9750	30.0948	32.3928	34.8827	37.5811
15	16.0969	17.2834	18.5989	20.0236	21.5788	23.2780	25.1290	27.1323	29.3099	31.7725	34.6058	37.5297	40.4175	43.8424
16	17.2579	18.6393	20.1569	21.8245	23.6575	25.6725	27.8881	30.3243	33.0034	35.9497	39.1899	42.7533	46.8717	50.9904
17	18.4304	20.0121	21.7616	23.6975	25.8404	28.2129	30.8402	33.7502	36.9737	40.5447	44.5008	48.8837	53.7391	59.1176
18	19.6147	21.4123	23.4144	25.6454	28.1324	30.9057	33.9990	37.4502	41.3013	45.5992	50.3959	55.7497	61.7251	68.3941
19	20.8109	22.8408	25.1169	27.6712	30.5390	33.7600	37.3790	41.4483	46.0185	51.1591	56.9395	63.4397	70.7494	78.9892
20	22.0190	24.2974	26.8704	29.7781	33.0680	36.7858	40.9955	45.7820	51.1801	57.2750	64.2028	72.0824	80.9488	91.0249
25	28.2432	32.0303	36.4593	41.8459	47.7271	54.8845	63.2490	73.1059	84.7009	98.3471	114.4133	133.3339	155.8196	181.8708
30	34.7849	40.5681	47.5754	56.0849	66.4388	79.0582	94.4808	113.2832	136.3075	164.4940	199.0209	241.3327	293.1992	356.7868
35	41.6803	49.9945	60.4621	73.8522	90.3203	111.4348	138.2369	172.3168	215.7108	271.0244	341.5896	431.6835	546.8806	693.5727
40	48.8864	60.4020	75.4013	95.0255	120.7998	154.7820	199.6351	258.0585	337.8824	442.5828	581.8261	767.0914	1013.7042	1342.0251
50	64.4832	84.5794	112.7989	152.6671	209.3480	290.3359	408.5289	573.7702	815.0838	1163.6085	1668.7712	2400.0182	3458.8071	4994.5213

Periods	15%	16%	17%	18%	19%	20%	22%	24%	25%	26%	28%	30%	32%	38%
1	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
2	2.1500	2.1600	2.1700	2.1800	2.1900	2.2000	2.2200	2.2400	2.2500	2.2600	2.2800	2.3000	2.3200	2.3600
3	3.4725	3.5056	3.5389	3.5724	3.6061	3.6400	3.7084	3.7778	3.8125	3.8478	3.9184	3.9900	4.0624	4.2086
4	4.9934	5.0685	5.1405	5.2154	5.2913	5.3680	5.5242	5.6824	5.7856	5.8480	6.0158	6.1870	6.3624	6.7251
5	6.7424	6.8771	7.0144	7.1542	7.2966	7.4418	7.7396	8.0484	8.2070	8.3684	8.6996	9.0431	9.3983	10.1481
6	8.7537	8.9775	9.2068	9.4420	9.6830	9.9299	10.4423	10.9801	11.2588	11.5442	12.1359	12.7560	13.4058	14.7987
7	11.0668	11.4139	11.7720	12.1415	12.5227	12.9159	13.7396	14.6153	15.0735	15.5458	16.5339	17.5828	18.6956	21.1262
8	13.7268	14.2401	14.7733	15.3270	15.9020	16.4991	17.7623	19.1229	19.8419	20.5876	22.1634	23.8577	25.6782	29.7316
9	16.7858	17.5185	18.2847	19.0859	19.9234	20.7989	22.6700	24.7125	25.8023	26.9404	29.3692	32.0150	34.8953	41.4350
10	20.3037	21.3215	22.3831	23.5213	24.7089	25.9587	28.6574	31.6434	33.2529	34.9449	39.5828	42.6195	47.0818	57.3516
11	24.3493	25.7329	27.1999	28.7551	30.4035	32.1504	35.9620	40.2379	42.5661	45.0306	50.3985	56.4053	63.1215	78.9982
12	29.0017	30.8502	32.8239	34.9311	37.1802	39.5805	44.8737	50.9950	54.2077	57.7396	65.5100	74.3270	84.3204	108.4375
13	34.3519	36.7892	39.4040	42.2187	45.2445	48.4988	55.7459	64.1097	68.7596	73.7508	84.8529	97.6250	112.3030	148.4750
14	40.5047	43.8720	47.1027	50.8180	54.8409	59.1959	69.0100	80.4981	86.9485	93.9258	109.8117	127.9125	149.2399	202.9290
15	47.5804	51.8595	56.1101	60.9853	66.2607	72.0351	85.1922	100.8151	109.6888	119.3465	141.3029	167.2983	197.5967	278.9783
16	55.7175	60.9250	66.6488	72.9390	79.8502	87.4421	104.9345	126.0108	138.1085	151.3768	181.8677	218.4722	262.3557	377.8919
17	65.0751	71.6730	78.9792	87.0680	96.0218	105.9306	129.0201	157.2534	173.6357	191.7345	233.7907	285.0139	347.3095	514.0610
18	75.8364	84.1407	93.4056	103.7403	115.2859	128.1187	158.4045	195.9942	218.0446	242.5855	300.2521	371.5180	459.4485	700.9389
19	88.2118	98.6032	110.2846	123.4135	138.1664	154.7400	194.2535	244.0328	273.5558	306.8577	385.3227	483.9734	607.4721	954.2769
20	102.4436	115.3797	130.0329	146.6280	165.4180	186.8580	237.9993	303.8006	342.9447	387.3887	494.2131	630.1655	802.8631	1298.8168
25	212.7930	249.2140	292.1049	342.6035	402.0425	471.9811	650.9551	898.0918	1054.7912	1238.8363	1706.8031	2348.8033	3228.84	6053.0039
30	434.7451	530.3117	647.4391	790.9480	966.7122	1181.8818	1787.0813	2640.9164	3227.1743	3942.0260	5873.2306	8729.9655	12940.86	28172.28
35	881.1702	1120.7130	1426.4910	1816.6516	2314.2137	2948.3411	4783.6447	7750.2251	9856.7613	12527.44	20188.968	32422.87	51888.43	131084.12
40	1779.09	2360.76	3134.52	4183.21	5529.83	7343.86	12936.54	22728.80	30088.86	39792.98	69377.48	120392.88	207674.27	608890.48
50	7217.72	10435.65	15089.50	21613.09	31515.34	45497.19	94525.28	195372.84	280256.89	401974.47	819103.08	1659761	3338460	13202064

Table 3: Present Value Interest Factor $(1 + r)^{-n}$

Periods	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%	14%
1	0.9901	0.9804	0.9709	0.9615	0.9524	0.9434	0.9348	0.9259	0.9174	0.9091	0.9009	0.8929	0.8850	0.8772
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
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
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
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
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
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
8	0.9235	0.8535	0.7894	0.7307	0.6769	0.6274	0.5820	0.5403	0.5019	0.4665	0.4339	0.4039	0.3762	0.3506
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
10	0.9053	0.8203	0.7441	0.6758	0.6139	0.5584	0.5083	0.4632	0.4224	0.3855	0.3522	0.3220	0.2948	0.2697
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
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
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
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
15	0.8613	0.7430	0.6419	0.5553	0.4810	0.4173	0.3628	0.3152	0.2745	0.2394	0.2090	0.1827	0.1599	0.1401
16	0.8528	0.7284	0.6232	0.5339	0.4581	0.3936	0.3387	0.2919	0.2519	0.2178	0.1883	0.1631	0.1415	0.1229
17	0.8444	0.7142	0.6050	0.5134	0.4363	0.3714	0.3168	0.2703	0.2311	0.1978	0.1696	0.1456	0.1252	0.1078
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
19	0.8277	0.6864	0.5703	0.4748	0.3957	0.3305	0.2765	0.2317	0.1945	0.1635	0.1377	0.1161	0.0981	0.0829
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
25	0.7798	0.6095	0.4776	0.3751	0.2953	0.2330	0.1842	0.1460	0.1160	0.0923	0.0738	0.0588	0.0471	0.0378
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
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
40	0.6717	0.4529	0.3066	0.2083	0.1420	0.0972	0.0688	0.0460	0.0318	0.0221	0.0154	0.0107	0.0075	0.0053
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

Periods	15%	16%	17%	18%	19%	20%	22%	24%	26%	28%	30%	32%	36%	
1	0.8696	0.8621	0.8547	0.8475	0.8403	0.8333	0.8197	0.8065	0.8000	0.7937	0.7813	0.7692	0.7576	0.7353
2	0.7561	0.7432	0.7305	0.7182	0.7062	0.6944	0.6719	0.6504	0.6400	0.6299	0.6104	0.5917	0.5739	0.5407
3	0.6575	0.6407	0.6244	0.6086	0.5934	0.5787	0.5507	0.5245	0.5120	0.4999	0.4788	0.4552	0.4348	0.3975
4	0.5718	0.5523	0.5337	0.5158	0.4987	0.4823	0.4514	0.4230	0.4096	0.3968	0.3725	0.3501	0.3294	0.2923
5	0.4972	0.4761	0.4561	0.4371	0.4190	0.4019	0.3700	0.3411	0.3277	0.3149	0.2910	0.2693	0.2495	0.2149
6	0.4323	0.4104	0.3898	0.3704	0.3521	0.3349	0.3033	0.2751	0.2621	0.2499	0.2274	0.2072	0.1890	0.1580
7	0.3759	0.3538	0.3332	0.3139	0.2959	0.2791	0.2486	0.2218	0.2097	0.1983	0.1776	0.1594	0.1432	0.1162
8	0.3269	0.3050	0.2848	0.2660	0.2487	0.2326	0.2038	0.1789	0.1678	0.1574	0.1388	0.1226	0.1085	0.0854
9	0.2843	0.2630	0.2434	0.2255	0.2090	0.1938	0.1670	0.1443	0.1342	0.1249	0.1084	0.0943	0.0822	0.0628
10	0.2472	0.2267	0.2080	0.1911	0.1756	0.1615	0.1368	0.1164	0.1074	0.0992	0.0847	0.0725	0.0623	0.0462
11	0.2149	0.1954	0.1778	0.1619	0.1476	0.1346	0.1122	0.0938	0.0859	0.0787	0.0662	0.0558	0.0472	0.0340
12	0.1889	0.1685	0.1520	0.1372	0.1240	0.1122	0.0920	0.0757	0.0687	0.0625	0.0517	0.0429	0.0357	0.0250
13	0.1625	0.1452	0.1299	0.1163	0.1042	0.0935	0.0754	0.0610	0.0550	0.0496	0.0404	0.0330	0.0271	0.0184
14	0.1413	0.1252	0.1110	0.0985	0.0876	0.0779	0.0618	0.0492	0.0440	0.0393	0.0316	0.0254	0.0205	0.0135
15	0.1229	0.1079	0.0949	0.0835	0.0736	0.0649	0.0507	0.0397	0.0352	0.0312	0.0247	0.0195	0.0155	0.0099
16	0.1069	0.0930	0.0811	0.0708	0.0618	0.0541	0.0415	0.0320	0.0281	0.0248	0.0193	0.0150	0.0118	0.0073
17	0.0929	0.0802	0.0693	0.0600	0.0520	0.0451	0.0340	0.0258	0.0225	0.0197	0.0150	0.0116	0.0089	0.0054
18	0.0808	0.0691	0.0592	0.0508	0.0437	0.0376	0.0279	0.0208	0.0180	0.0156	0.0118	0.0089	0.0068	0.0039
19	0.0703	0.0596	0.0506	0.0431	0.0367	0.0313	0.0229	0.0168	0.0144	0.0124	0.0092	0.0068	0.0051	0.0029
20	0.0611	0.0514	0.0433	0.0365	0.0308	0.0261	0.0187	0.0135	0.0115	0.0098	0.0072	0.0053	0.0039	0.0021
25	0.0304	0.0245	0.0197	0.0160	0.0129	0.0105	0.0069	0.0046	0.0038	0.0031	0.0021	0.0014	0.0010	0.0005
30	0.0151	0.0116	0.0090	0.0070	0.0054	0.0042	0.0026	0.0016	0.0012	0.0010	0.0006	0.0004	0.0002	0.0001
35	0.0075	0.0055	0.0041	0.0030	0.0023	0.0017	0.0009	0.0005	0.0004	0.0003	0.0002	0.0001	0.0001	0.0000
40	0.0037	0.0026	0.0019	0.0013	0.0010	0.0007	0.0004	0.0002	0.0001	0.0001	0.0001	0.0000	0.0000	0.0000
50	0.0009	0.0006	0.0004	0.0003	0.0002	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Table 4: Present Value Interest Factor Annuity $\frac{1 - \frac{1}{(1+r)^n}}{r}$

Periods	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%	14%
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
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
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
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
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
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
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
8	7.6517	7.3255	7.0197	6.7327	6.4632	6.2098	5.9713	5.7468	5.5348	5.3349	5.1461	4.9676	4.7988	4.6389
9	8.5660	8.1822	7.8661	7.4353	7.1078	6.8017	6.5152	6.2469	5.9952	5.7590	5.5370	5.3282	5.1317	4.9484
10	9.4713	8.9826	8.5302	8.1109	7.7247	7.3691	7.0236	6.7101	6.4177	6.1448	5.8892	5.6502	5.4282	5.2181
11	10.3676	9.7868	9.2526	8.7605	8.3064	7.8869	7.4987	7.1390	6.8052	6.4951	6.2065	5.9377	5.6889	5.4527
12	11.2551	10.5753	9.9540	9.3851	8.8633	8.3638	7.9272	7.5381	7.1807	6.8137	6.4924	6.1944	5.9176	5.6603
13	12.1337	11.3484	10.6350	9.9858	9.3936	8.8527	8.3577	7.9038	7.4869	7.1034	6.7499	6.4235	6.1218	5.8424
14	13.0037	12.1082	11.2961	10.5631	9.8986	9.2950	8.7455	8.2442	7.7862	7.3667	6.9819	6.6282	6.3025	6.0021
15	13.8651	12.8493	11.9379	11.1184	10.3797	9.7122	9.1078	8.5585	8.0607	7.6061	7.1909	6.8109	6.4624	6.1422
16	14.7179	13.5777	12.5611	11.6523	10.8378	10.1059	9.4466	8.8514	8.3126	7.8237	7.3792	6.9740	6.6039	6.2651
17	15.5623	14.2919	13.1681	12.1657	11.2741	10.4773	9.7632	9.1216	8.5436	8.0216	7.5488	7.1196	6.7291	6.3729
18	16.3983	14.9920	13.7535	12.6593	11.6896	10.8276	10.0591	9.3719	8.7556	8.2014	7.7016	7.2497	6.8399	6.4674
19	17.2260	15.6785	14.3238	13.1339	12.0853	11.1581	10.3356	9.6036	8.9501	8.3649	7.8383	7.3658	6.9380	6.5504
20	18.0456	16.3514	14.8775	13.5903	12.4822	11.4699	10.5940	9.8181	9.1285	8.5136	7.9633	7.4594	7.0248	6.6231
25	22.0232	19.5235	17.4131	15.6221	14.0939	12.7834	11.6536	10.6748	9.8226	9.0770	8.4217	7.8431	7.3300	6.8729
30	25.8077	22.3965	19.6004	17.2920	15.3725	13.7648	12.4090	11.2578	10.2737	9.4289	8.6938	8.0552	7.4957	7.0027
35	29.4086	24.9986	21.4872	18.6646	16.3742	14.4982	12.9477	11.6546	10.5668	9.6442	8.8552	8.1755	7.5856	7.0700
40	32.8347	27.3555	23.1148	19.7928	17.1591	15.0463	13.3317	11.9246	10.7574	9.7791	8.9511	8.2438	7.6344	7.1050
50	39.1961	31.4236	25.7298	21.4822	18.2559	15.7619	13.8007	12.2355	10.9617	9.9148	9.0417	8.3045	7.6782	7.1327

Periods	15%	16%	17%	18%	19%	20%	22%	24%	25%	26%	28%	30%	32%	36%
1	0.8696	0.8621	0.8547	0.8475	0.8403	0.8333	0.8197	0.8065	0.8000	0.7937	0.7813	0.7692	0.7576	0.7353
2	1.6257	1.6052	1.5852	1.5656	1.5465	1.5278	1.4915	1.4568	1.4400	1.4235	1.3916	1.3609	1.3315	1.2760
3	2.2832	2.2459	2.2096	2.1743	2.1399	2.1065	2.0422	1.9813	1.9520	1.9234	1.8684	1.8161	1.7663	1.6735
4	2.8550	2.7982	2.7432	2.6901	2.6386	2.5887	2.4936	2.4043	2.3616	2.3202	2.2410	2.1662	2.0957	1.9658
5	3.3522	3.2743	3.1993	3.1272	3.0576	2.9906	2.8638	2.7454	2.6893	2.6351	2.5326	2.4356	2.3432	2.1807
6	3.7845	3.6847	3.5892	3.4976	3.4098	3.3255	3.1669	3.0205	2.9514	2.8850	2.7594	2.6427	2.5342	2.3388
7	4.1604	4.0386	3.9224	3.8115	3.7057	3.6046	3.4155	3.2423	3.1611	3.0833	2.9370	2.8021	2.6775	2.4550
8	4.4873	4.3436	4.2072	4.0776	3.9544	3.8372	3.6193	3.4212	3.3289	3.2407	3.0758	2.9247	2.7880	2.5404
9	4.7716	4.6055	4.4506	4.3030	4.1633	4.0310	3.7863	3.5655	3.4631	3.3657	3.1842	3.0190	2.8681	2.6033
10	5.0188	4.8332	4.6586	4.4941	4.3389	4.1925	3.9232	3.6819	3.5705	3.4848	3.2889	3.0915	2.9304	2.6495
11	5.2337	5.0286	4.8364	4.6560	4.4865	4.3271	4.0354	3.7757	3.6564	3.5435	3.3351	3.1473	2.9776	2.6834
12	5.4206	5.1971	4.9884	4.7932	4.6105	4.4392	4.1274	3.8514	3.7251	3.6059	3.3868	3.1903	3.0133	2.7084
13	5.5831	5.3423	5.1183	4.9095	4.7147	4.5327	4.2028	3.9124	3.7801	3.6555	3.4272	3.2233	3.0404	2.7268
14	5.7245	5.4675	5.2293	5.0081	4.8023	4.6106	4.2646	3.9616	3.8241	3.6949	3.4587	3.2487	3.0609	2.7403
15	5.8474	5.5755	5.3242	5.0916	4.8759	4.6755	4.3152	4.0013	3.8593	3.7261	3.4834	3.2682	3.0784	2.7502
16	5.9542	5.6685	5.4053	5.1624	4.9377	4.7296	4.3567	4.0333	3.8874	3.7509	3.5026	3.2832	3.0882	2.7575
17	6.0472	5.7487	5.4748	5.2223	4.9897	4.7746	4.3908	4.0591	3.9099	3.7705	3.5177	3.2948	3.0971	2.7629
18	6.1280	5.8178	5.5339	5.2732	5.0333	4.8122	4.4187	4.0799	3.9279	3.7861	3.5294	3.3037	3.1039	2.7668
19	6.1982	5.8775	5.5845	5.3162	5.0700	4.8435	4.4415	4.0967	3.9424	3.7985	3.5386	3.3105	3.1090	2.7697
20	6.2593	5.9288	5.6278	5.3527	5.1099	4.8698	4.4603	4.1103	3.9539	3.8083	3.5458	3.3158	3.1129	2.7718
25	6.4641	6.0971	5.7662	5.4669	5.1951	4.9476	4.5139	4.1474	3.9849	3.8342	3.5640	3.3286	3.1220	2.7765
30	6.5660	6.1772	5.8294	5.5168	5.2347	4.9789	4.5338	4.1601	3.9950	3.8424	3.5693	3.3321	3.1242	2.7775
35	6.6166	6.2153	5.8582	5.5386	5.2512	4.9915	4.5411	4.1644	3.9984	3.8450	3.5708	3.3330	3.1248	2.7777
40	6.6418	6.2335	5.8713	5.5482	5.2582	4.9966	4.5439	4.1659	3.9995	3.8458	3.5712	3.3332	3.1250	2.7778
50	6.6605	6.2463	5.8801	5.5541	5.2623	4.9995	4.5452	4.1666	3.9999	3.8461	3.5714	3.3333	3.1250	2.7778