

# 國立臺北科技大學

## 九十二學年度土木與防災研究所入學考試

### 工程經濟試題

填准考證號碼

第一頁 共一頁

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#### 注意事項：

1. 本試題共【8】題，每題 12.5 分，配分共 100 分。
2. 請按順序標明題號作答，不必抄題。
3. 全部答案均須答在答案卷之答案欄內，否則不予計分。

1. 某公司生產鋼筋，其每月固定成本為 60,000 元，每單位產品之變動成本為 0.8 元，每單位產品之售價為 2 元，請問損益平衡點為多少？平衡點之平均單位成本？
2. A 食品公司考慮進一部新機器，用以增加裝瓶的速度。機器成本為 \$45,000，而年現金流量如下。1 年次現金流量 \$15,000，2 年次現金流量 20,000，3 年次現金流量 25,000，4 年次現金流量 10,000，5 年次現金流量 5,000。A:若資金成本為 10%，請問選擇投資該新機器之淨現值為何 B:何為內部報酬率 C:該公司應進行該項投資嗎？為什麼？
3. 令姊五年後將開始大學求學生涯，而通知令尊其後四年每年花費 \$15,000。令尊於五年前已經開始籌畫此事，每年儲蓄 \$2,000，而今後打算持續進行儲蓄五年。請問：令尊今後五年儲蓄應增加儲蓄多少？才能滿足令姊之求學生涯所需，年利率為 10%。

4. 一部機器成本 80,000 元，殘值為 10,000 元，可工作時數和為 20,000 小時，若第二年工作時間何為 10,000 小時，則以工作時間法求其第二年折舊值？
5. Maintenance costs for a small bridge with an expected 60-year life are estimated to be \$1,000 each year for the first 5 years followed by \$10,000 expenditure in the year 15 and \$10,000 expenditure in year 30. If  $i=10\%$  per year, what is the equivalent uniform annual cost over the entire 60-year-period.
6. An individual is borrowing \$100,000 at 8% interest compounded annually. The loan is to be repaid in equal annual payments over 30 years. However, just after the eighth payment is made, the lender allows the borrower to triple the annual payment. The borrower agrees to this increased payment. If the lender is still charging 8% per year, compounded annually, on the unpaid balance of the loan, what is the balance still owed just after the twelfth payment is made?
7. 假若 x 先生向銀行借款 \$50,000，年利率 10%，為期 8 年，並準備每年以相等之金額償還此項借款之本利和，請問 x 先生每年應平均償還多少金額，又第一年償還之金額中，屬於本金部份有多少？再請問，第二年償還之金額中，屬於本金部份有多少？屬於利息部份有多少？
8. 解釋名詞 a. 機會成本； b. 沉沒成本； c. 固定成本； d. 變動成本； e. 折舊； f. GDP

注意：背面尚有參考資料

附錄 A \$1 的本利和  $FV = PV(1+i)^n$

期數	百分比										
	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%
1	1.010	1.020	1.030	1.040	1.050	1.060	1.070	1.080	1.090	1.100	1.110
2	1.020	1.040	1.061	1.082	1.103	1.124	1.145	1.166	1.188	1.210	1.232
3	1.030	1.061	1.093	1.125	1.158	1.191	1.225	1.260	1.295	1.331	1.368
4	1.041	1.082	1.126	1.170	1.216	1.262	1.311	1.360	1.412	1.464	1.518
5	1.051	1.104	1.159	1.217	1.276	1.338	1.403	1.469	1.539	1.611	1.685
6	1.062	1.126	1.194	1.265	1.340	1.419	1.501	1.587	1.677	1.772	1.870
7	1.072	1.149	1.230	1.316	1.407	1.504	1.606	1.714	1.828	1.949	2.076
8	1.083	1.172	1.267	1.369	1.477	1.594	1.718	1.851	1.993	2.144	2.305
9	1.094	1.195	1.305	1.423	1.551	1.689	1.838	1.999	2.172	2.358	2.558
10	1.105	1.219	1.344	1.480	1.629	1.791	1.967	2.159	2.367	2.594	2.839
11	1.116	1.243	1.384	1.539	1.710	1.898	2.105	2.332	2.580	2.853	3.152
12	1.127	1.268	1.426	1.601	1.796	2.012	2.252	2.518	2.813	3.138	3.498
13	1.138	1.294	1.469	1.665	1.886	2.133	2.410	2.720	3.066	3.452	3.883
14	1.149	1.319	1.513	1.732	1.980	2.261	2.579	2.937	3.342	3.797	4.310
15	1.161	1.346	1.558	1.801	2.079	2.397	2.759	3.172	3.642	4.177	4.785
16	1.173	1.373	1.605	1.873	2.183	2.540	2.952	3.426	3.970	4.595	5.311
17	1.184	1.400	1.653	1.948	2.292	2.693	3.159	3.700	4.328	5.054	5.895
18	1.196	1.428	1.702	2.206	2.407	2.854	3.380	3.996	4.717	5.560	6.544
19	1.208	1.457	1.754	2.107	2.527	3.026	3.617	4.316	5.142	6.116	7.263
20	1.220	1.486	1.806	2.191	2.653	3.027	3.870	4.661	5.604	6.727	8.062
25	1.282	1.641	2.094	2.666	3.386	4.292	5.427	6.848	8.623	10.835	13.585
30	1.348	1.811	2.427	3.243	4.322	5.743	7.612	10.063	13.268	17.449	22.892
40	1.489	2.208	3.262	4.801	7.040	10.286	14.974	21.725	31.409	45.259	65.001
50	1.645	2.692	4.384	7.107	11.467	18.420	29.457	46.902	74.358	117.39	184.57

附錄 A \$1 的本利和 (續)

期數	百分比										
	12%	13%	14%	15%	16%	17%	18%	19%	20%	25%	30%
1	1.120	1.130	1.140	1.150	1.160	1.170	1.180	1.190	1.200	1.250	1.300
2	1.254	1.277	1.300	1.323	1.346	1.369	1.392	1.416	1.440	1.563	1.690
3	1.405	1.443	1.482	1.521	1.561	1.602	1.643	1.685	1.728	1.953	2.197
4	1.574	1.630	1.689	1.749	1.811	1.874	1.939	2.005	2.074	2.441	2.856
5	1.762	1.842	1.925	2.011	2.100	2.192	2.288	2.386	2.488	3.052	3.713
6	1.974	2.082	2.195	2.313	2.436	2.565	2.700	2.840	2.986	3.815	4.827
7	2.211	2.353	2.502	2.660	2.826	3.001	3.185	3.379	3.583	4.766	6.276
8	2.476	2.658	2.853	3.059	3.278	3.511	3.759	4.021	4.300	5.960	8.157
9	2.773	3.004	3.252	3.518	3.803	4.108	4.435	4.785	5.160	7.451	10.604
10	3.106	3.395	3.707	4.046	4.411	4.807	5.234	5.696	6.192	9.313	13.786
11	3.479	3.836	4.226	4.652	5.117	5.624	6.176	6.777	7.430	11.642	17.922
12	3.896	4.335	4.818	5.350	5.936	6.580	7.288	8.064	8.916	14.552	23.298
13	4.363	4.898	5.492	6.153	6.886	7.699	8.599	9.596	10.699	18.190	30.288
14	4.887	5.535	6.261	7.076	7.988	9.007	10.147	11.420	12.839	22.737	39.374
15	5.474	6.254	7.138	8.137	9.266	10.539	11.974	13.590	15.407	28.422	51.186
16	6.130	7.067	8.137	9.358	10.748	12.330	14.129	16.172	18.488	35.527	66.542
17	6.866	7.986	9.276	10.761	12.468	14.426	16.672	19.244	22.186	44.409	86.504
18	7.690	9.024	10.575	12.375	14.463	16.879	19.673	22.091	26.623	55.511	112.46
19	8.613	10.197	12.056	14.232	16.777	19.748	23.214	27.252	31.948	69.389	146.19
20	9.646	11.523	13.743	16.367	19.461	23.106	27.393	32.429	38.338	86.736	190.05
25	17.000	21.231	26.462	32.919	40.874	50.658	62.669	77.388	95.396	264.70	705.64
30	29.950	39.116	50.950	66.212	85.850	111.07	143.37	184.68	237.38	807.79	2,620.0
40	93.051	132.78	188.88	267.86	378.72	533.87	750.36	1,051.7	1,469.8	7,523.2	36,119.
50	289.00	450.74	700.23	1,083.7	1,670.7	2,566.2	3,927.4	5,988.9	9,100.4	70,065	497,929

附錄 B \$1 的現值  $PV = FV \left[ \frac{1}{(1+i)^n} \right]$

期數	百分比											
	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%
1	0.990	0.980	0.971	0.962	0.952	0.943	0.935	0.926	0.917	0.909	0.901	0.893
2	0.980	0.961	0.943	0.925	0.907	0.890	0.873	0.857	0.842	0.826	0.812	0.797
3	0.971	0.942	0.915	0.889	0.864	0.840	0.816	0.794	0.772	0.751	0.731	0.712
4	0.961	0.924	0.885	0.855	0.823	0.792	0.763	0.735	0.708	0.683	0.659	0.636
5	0.951	0.906	0.863	0.822	0.784	0.747	0.713	0.681	0.650	0.621	0.593	0.567
6	0.942	0.888	0.837	0.790	0.746	0.705	0.666	0.630	0.596	0.564	0.535	0.507
7	0.933	0.871	0.813	0.760	0.711	0.665	0.623	0.583	0.547	0.513	0.482	0.452
8	0.923	0.853	0.789	0.731	0.677	0.627	0.582	0.540	0.502	0.467	0.434	0.404
9	0.914	0.837	0.766	0.703	0.645	0.592	0.544	0.500	0.460	0.424	0.391	0.361
10	0.905	0.820	0.744	0.676	0.614	0.558	0.508	0.463	0.422	0.386	0.352	0.322
11	0.896	0.804	0.722	0.650	0.585	0.527	0.475	0.429	0.388	0.350	0.317	0.287
12	0.887	0.788	0.701	0.625	0.557	0.497	0.444	0.397	0.356	0.319	0.286	0.257
13	0.879	0.773	0.681	0.601	0.530	0.469	0.415	0.368	0.326	0.290	0.258	0.229
14	0.870	0.758	0.661	0.577	0.505	0.442	0.388	0.340	0.299	0.263	0.232	0.205
15	0.861	0.743	0.642	0.555	0.481	0.417	0.362	0.315	0.275	0.239	0.209	0.183
16	0.853	0.728	0.623	0.534	0.458	0.394	0.339	0.292	0.252	0.218	0.188	0.163
17	0.844	0.714	0.605	0.513	0.436	0.371	0.317	0.270	0.231	0.198	0.170	0.146
18	0.836	0.700	0.587	0.494	0.416	0.350	0.296	0.250	0.212	0.180	0.153	0.130
19	0.828	0.686	0.570	0.475	0.396	0.331	0.277	0.232	0.194	0.164	0.138	0.116
20	0.820	0.673	0.554	0.456	0.377	0.312	0.258	0.215	0.178	0.149	0.124	0.104
25	0.780	0.610	0.478	0.375	0.295	0.233	0.184	0.146	0.116	0.092	0.074	0.059
30	0.742	0.552	0.412	0.308	0.231	0.174	0.131	0.099	0.075	0.057	0.044	0.033
40	0.672	0.453	0.307	0.208	0.142	0.097	0.067	0.046	0.032	0.022	0.015	0.011
50	0.608	0.372	0.228	0.141	0.087	0.054	0.034	0.021	0.013	0.009	0.005	0.003

附錄 B \$1 的現值 (續)

期數	百分比												
	13%	14%	15%	16%	17%	18%	19%	20%	25%	30%	35%	40%	50%
1	0.885	0.877	0.870	0.862	0.855	0.847	0.840	0.833	0.800	0.769	0.741	0.714	0.667
2	0.783	0.769	0.755	0.743	0.731	0.718	0.706	0.694	0.640	0.592	0.549	0.510	0.444
3	0.693	0.675	0.658	0.641	0.624	0.609	0.593	0.579	0.512	0.455	0.406	0.364	0.296
4	0.613	0.592	0.572	0.552	0.534	0.515	0.499	0.482	0.410	0.350	0.301	0.260	0.198
5	0.543	0.519	0.497	0.476	0.456	0.437	0.419	0.402	0.328	0.269	0.223	0.186	0.132
6	0.480	0.456	0.432	0.410	0.390	0.370	0.352	0.335	0.262	0.207	0.165	0.133	0.088
7	0.425	0.400	0.376	0.354	0.333	0.314	0.296	0.279	0.210	0.159	0.122	0.095	0.059
8	0.376	0.351	0.327	0.305	0.285	0.266	0.249	0.233	0.168	0.123	0.091	0.068	0.039
9	0.333	0.300	0.284	0.263	0.243	0.225	0.209	0.194	0.134	0.094	0.067	0.048	0.026
10	0.295	0.270	0.247	0.227	0.208	0.191	0.176	0.162	0.107	0.073	0.050	0.035	0.017
11	0.261	0.237	0.215	0.195	0.178	0.162	0.148	0.135	0.086	0.056	0.037	0.025	0.012
12	0.231	0.208	0.187	0.168	0.152	0.137	0.124	0.112	0.069	0.043	0.027	0.018	0.008
13	0.204	0.182	0.163	0.145	0.130	0.116	0.104	0.093	0.055	0.033	0.020	0.013	0.005
14	0.181	0.160	0.141	0.125	0.111	0.099	0.088	0.078	0.044	0.025	0.015	0.009	0.003
15	0.160	0.140	0.123	0.108	0.095	0.084	0.074	0.065	0.035	0.020	0.011	0.006	0.002
16	0.141	0.123	0.107	0.093	0.081	0.071	0.062	0.054	0.028	0.015	0.008	0.005	0.002
17	0.125	0.108	0.093	0.080	0.069	0.060	0.052	0.045	0.023	0.012	0.006	0.003	0.001
18	0.111	0.095	0.081	0.069	0.059	0.051	0.044	0.038	0.018	0.009	0.005	0.002	0.001
19	0.098	0.083	0.070	0.060	0.051	0.043	0.037	0.031	0.014	0.007	0.003	0.002	0
20	0.087	0.073	0.061	0.051	0.043	0.037	0.031	0.026	0.012	0.005	0.002	0.001	0
25	0.047	0.038	0.030	0.024	0.020	0.016	0.013	0.010	0.004	0.001	0.001	0	0
30	0.026	0.020	0.015	0.012	0.009	0.007	0.005	0.004	0.001	0	0	0	0
40	0.008	0.005	0.002	0.003	0.002	0.001	0.001	0.001	0	0	0	0	0
50	0.002	0.001	0.001	0.001	0	0	0	0	0	0	0	0	0

Source: Maurice Jay, Introduction to Financial Management (Homewood III: Richard D. Irwin, 1997)

注意：尚有參考資料

附錄 C 年金\$1之本利和  $FV_{FA} = A \frac{(1+i)^n - 1}{i}$

期數	百分比										
	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%
1	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
3	3.030	3.060	3.091	3.122	3.153	3.184	3.215	3.246	3.278	3.310	3.342
4	4.060	4.122	4.184	4.246	4.310	4.375	4.440	4.505	4.573	4.641	4.710
5	5.101	5.204	5.309	5.416	5.526	5.637	5.751	5.867	5.985	6.105	6.228
6	6.152	6.368	6.488	6.633	6.802	6.975	7.153	7.336	7.523	7.716	7.913
7	7.214	7.434	7.662	7.898	8.142	8.394	8.654	8.923	9.200	9.487	9.783
8	8.286	8.583	8.892	9.214	9.549	9.897	10.260	10.637	11.028	11.433	11.850
9	9.369	9.755	10.159	10.583	11.027	11.491	11.978	12.488	13.021	13.579	14.164
10	10.462	10.950	11.464	12.006	12.578	13.181	13.816	14.487	15.193	15.937	16.722
11	11.567	12.169	12.808	13.486	14.207	14.972	15.784	16.645	17.560	18.531	19.561
12	12.683	13.412	14.192	15.026	15.917	16.870	17.888	18.977	20.141	21.384	22.713
13	13.809	14.680	15.618	16.627	17.713	18.882	20.141	21.495	22.953	24.523	26.212
14	14.947	15.974	17.068	18.282	19.599	21.015	22.550	24.215	26.019	27.975	30.095
15	16.097	17.283	18.699	20.024	21.579	23.276	25.129	27.152	29.361	31.772	34.405
16	17.258	18.639	20.157	21.825	23.657	25.673	27.888	30.324	33.003	35.950	39.190
17	18.430	20.012	21.762	23.698	25.840	28.215	30.840	33.750	36.974	40.545	44.501
18	19.615	21.412	23.414	25.845	28.132	30.906	33.999	37.450	41.301	45.599	50.396
19	20.811	22.841	25.117	27.671	30.539	33.760	37.379	41.446	46.018	51.159	56.939
20	22.019	24.287	26.870	29.778	33.066	36.786	40.995	45.762	51.160	57.275	64.203
25	28.243	32.030	36.459	41.646	47.727	54.865	63.249	73.108	84.701	98.347	114.41
30	34.785	40.588	47.575	56.065	66.439	79.058	94.461	113.28	136.31	164.49	199.02
40	48.886	60.402	75.401	95.026	120.80	154.76	199.64	259.06	337.89	442.59	581.83
50	64.463	84.579	112.80	152.87	209.36	290.34	406.53	573.77	815.08	1,163.9	1,668.8

附錄 C 年金\$1之本利和 (續)

期數	百分比										
	12%	13%	14%	15%	16%	17%	18%	19%	20%	25%	30%
1	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2	2.120	2.130	2.140	2.150	2.160	2.170	2.180	2.190	2.200	2.250	2.300
3	3.374	3.407	3.440	3.473	3.506	3.539	3.572	3.606	3.640	3.813	3.990
4	4.779	4.850	4.921	4.993	5.066	5.141	5.215	5.291	5.368	5.786	6.187
5	6.353	6.480	6.610	6.742	6.877	7.014	7.154	7.297	7.442	8.207	9.043
6	8.115	8.323	8.536	8.754	8.977	9.207	9.442	9.683	9.930	11.259	12.756
7	10.089	10.405	10.730	11.067	11.414	11.772	12.142	12.523	12.916	15.073	17.583
8	12.300	12.757	13.233	13.727	14.240	14.773	15.327	15.902	16.499	19.842	23.858
9	14.776	15.416	16.085	16.786	17.519	18.285	19.086	19.923	20.799	25.802	32.015
10	17.549	18.420	19.337	20.304	21.321	22.393	23.521	24.701	25.959	33.253	42.619
11	20.655	21.814	23.045	24.349	25.733	27.200	28.755	30.404	32.150	42.566	56.405
12	24.133	25.650	27.271	29.002	30.850	32.824	34.931	37.180	39.581	54.208	74.327
13	28.028	29.985	32.089	34.352	36.786	39.404	42.219	45.244	48.497	68.780	97.625
14	32.393	34.883	37.581	40.505	43.672	47.103	50.818	54.841	59.186	86.949	127.91
15	37.280	40.417	43.842	47.580	51.660	46.110	60.965	66.261	72.035	109.69	167.29
16	42.753	46.672	50.980	55.717	60.925	66.649	72.939	79.850	87.442	138.11	218.47
17	48.884	53.739	59.118	65.075	71.873	78.979	87.068	96.022	105.93	173.64	285.01
18	55.750	61.725	68.394	75.836	84.141	93.406	103.74	115.27	128.12	218.05	371.52
19	63.440	70.749	78.989	88.212	98.803	110.29	123.41	138.17	154.74	273.56	483.97
20	72.052	80.947	91.025	102.44	115.38	130.03	146.63	165.42	186.69	342.95	630.17
25	133.33	155.62	181.87	212.79	249.21	292.11	342.60	402.04	471.98	1,054.8	2,348.80
30	241.33	293.20	356.79	434.75	530.31	647.44	790.95	966.7	1,181.9	3,227.2	8,730.0
40	767.09	1,013.7	1,342.0	1,779.1	2,360.8	3,134.5	4,163.21	5,529.8	7,343.9	30,089	120,393
50	2,400.0	3,459.5	4,984.5	7,217.7	10,436	15,090	21,813	31,515	45,497	280,256	185,976

附錄 D 年金\$1之現值  $PV_{FA} = A \frac{1 - \frac{1}{(1+i)^n}}{i}$

期數	百分比											
	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%
1	0.990	0.980	0.971	0.962	0.952	0.943	0.935	0.926	0.917	0.909	0.901	0.893
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
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
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
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
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
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
8	7.652	7.325	7.020	6.733	6.463	6.210	5.971	5.747	5.535	5.335	5.146	4.968
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
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
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
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
13	12.134	11.348	10.635	9.968	9.394	8.853	8.358	7.904	7.487	7.103	6.750	6.424
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
15	13.865	12.849	11.939	11.118	10.360	9.712	9.108	8.559	8.061	7.608	7.191	6.811
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
17	15.562	14.292	13.166	12.166	11.274	10.477	9.763	9.122	8.544	8.022	7.549	7.102
18	16.398	14.982	13.754	12.659	11.690	10.828	10.069	9.372	8.758	8.201	7.702	7.250
19	17.226	15.678	14.324	13.134	12.085	11.158	10.336	9.604	8.950	8.365	7.839	7.366
20	18.046	16.351	14.877	13.590	12.462	11.470	10.594	9.818	9.129	8.514	7.963	7.469
25	22.023	19.523	17.413	15.622	14.094	12.783	11.654	10.675	9.823	9.077	8.422	7.843
30	25.808	22.396	19.600	17.792	15.372	13.765	12.409	11.258	10.274	9.427	8.694	8.055
40	32.835	27.355	23.115	19.793	17.159	15.046	13.332	11.925	10.757	9.779	8.951	8.244
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

附錄 D 年金\$1之現值 (續)

期數	百分比												
	13%	14%	15%	16%	17%	18%	19%	20%	25%	30%	35%	40%	50%
1	0.885	0.877	0.870	0.862	0.855	0.847	0.840	0.833	0.800	0.769	0.741	0.714	0.667
2	1.668	1.647	1.626	1.605	1.585	1.566	1.547	1.528	1.440	1.361	1.289	1.224	1.111
3	2.361	2.322	2.283	2.246	2.210	2.174	2.140	2.106	1.952	1.816	1.696	1.589	1.407
4	2.974	2.914	2.855	2.798	2.743	2.690	2.639	2.589	2.362	2.166	1.997	1.849	1.605
5	3.517	3.433	3.352	3.274	3.199	3.127	3.058	2.991	2.689	2.436	2.220	2.035	1.737
6	3.998	3.889	3.784	3.685	3.589	3.498	3.410	3.326	2.951	2.643	2.385	2.168	1.824
7	4.423	4.288	4.160	4.039	3.922	3.812	3.706	3.605	3.161	2.802	2.508	2.263	1.883
8	4.799	4.639	4.487	4.344	4.207	4.078	3.954	3.837	3.329	2.925	2.598	2.331	1.922
9	5.132	4.946	4.772	4.607	4.451	4.303	4.163	4.031	3.483	3.019	2.655	2.379	1.948
10	5.426	5.216	5.019	4.833	4.659	4.494	4.339	4.192	3.571	3.092	2.715	2.414	1.965
11	5.687	5.453	5.234	5.029	4.836	4.656	4.486	4.327	3.656	3.147	2.752	2.438	1.977
12	5.918	5.660	5.421	5.197	4.988	4.793	4.611	4.439	3.725	3.190	2.779	2.456	1.985
13	6.122	5.842	5.583	5.342	5.118	4.910	4.715	4.533	3.780	3.223	2.799	2.469	1.990
14	6.302	6.002	5.724	5.468	5.229	5.008	4.802	4.611	3.824	3.249	2.814	2.478	1.993
15	6.462	6.142	5.847	5.575	5.324	5.092	4.876	4.675	3.859	3.268	2.825	2.484	1.995
16	6.604	6.265	5.954	5.668	5.405	5.162	4.938	4.730	3.887	3.283	2.834	2.489	1.997
17	6.729	6.373	6.047	5.749	5.475	5.222	4.988	4.775	3.910	3.295	2.840	2.492	1.998
18	6.840	6.467	6.128	5.818	5.534	5.273	5.033	4.812	3.928	3.304	2.844	2.494	1.999
19	6.938	6.550	6.198	5.877	5.584	5.316	5.070	4.843	3.942	3.311	2.848	2.496	1.999
20	7.025	6.623	6.259	5.929	5.628	5.353	5.101	4.870	3.954	3.316	2.850	2.497	1.999
25	7.330	6.873	6.464	6.097	5.766	5.467	5.195	4.948	3.985	3.329	2.856	2.499	2.000
30	7.496	7.003	6.566	6.177	5.829	5.517	5.235	4.979	3.995	3.332	2.857	2.500	2.000
40	7.634	7.105	6.642	6.233	5.871	5.548	5.258	4.997	3.999	3.333	2.857	2.500	2.000
50	7.675	7.133	6.661	6.246	5.880	5.554	5.262	4.999	4.000	3.333	2.857	2.500	2.000