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 II : 2022/2023

DPB30063 : STATISTICS

TARIKH   : 13 JUN 2023
MASA   : 8.30 PG -10.30 PG (2 JAM)

Kertas ini mengandungi **SEMBILAN (9)** halaman bercetak.

Struktur (4 soalan)

Dokumen sokongan yang disertakan : Kertas Graf, Formula, Table

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIARAHKAN

(CLO yang tertera hanya sebagai rujukan)

INSTRUCTION:

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

ARAHAN:

*Bahagian ini mengandungi **EMPAT (4)** soalan struktur. Jawap **SEMUA** soalan.*

QUESTION 1

SOALAN 1

CLO 1   (a)   Identify the quantitative or qualitative data for these statements.

Kenalpasti data kuantitatif atau kualitatif bagi penyataan ini.

           i.   The weight of the newborn baby is 3.45kg.

                   Berat bayi yang baru lahir ialah 3.45kg.

           ii.   Adam goes swimming four times a week.

                   Adam pergi berenang empat kali seminggu.

           iii.   Sabrina has curly brown hair.

                   Sabrina berambut perang keriting.

           iv.   Maria drives a white car.

                   Maria memandu kereta putih.

           v.   Brian has one elder brother and two younger sisters.

                   Brian mempunyai seorang abang dan dua orang adik perempuan.

[5 marks]

[*5 markah*]

CLO 2   (b)   An insurance company researcher conducted a survey on the number of car thefts in a large city for 30 days. The data are as follows.

Penyelidik dari syarikat insurans menjalankan tinjauan tentang kecurian kereta di sebuah bandar besar untuk tempoh 30 hari. Data adalah seperti berikut.

52	62	51	50	69
58	77	66	53	57
75	56	55	67	73
79	59	68	65	72
57	51	63	69	75
65	53	78	66	55

i)   Detail the range, number of classes and class size for the data above.

Perincikan julat, bilangan kelas dan saiz kelas bagi data di atas.

[10 marks]

[*10 markah*]

ii)   Construct a frequency distribution table consisting of class interval, frequency, midpoint, and class boundaries.

Bina jadual taburan kekerapan yang terdiri daripada selang kelas, kekerapan, titik tengah dan sempadan kelas.

[10 marks]

[*10 markah*]

QUESTION 2

SOALAN 2

CLO 2

(a) Hani Zulaikha has just launched her new scarf called *KekNi*. She is interested to determine the number of customers who visit her shop to buy the *KekNi* scarf within one month.

Hani Zulaikha baharu sahaja melancarkan tudung baharunya yang bernama KekNi. Dia berminat untuk menentukan bilangan pelanggan yang mengunjungi kedainya untuk membeli selendang KekNi dalam masa satu bulan.

Day *Hari*	Number of Customers *Bilangan Pelanggan*
1 – 5	11
6 – 10	18
11 – 15	32
16 – 20	24
21 – 25	20
26 – 30	15

Based on the above information, locate the center of tendency by computing;

Berdasarkan informasi di atas, cari kecenderungan memusat dengan mengira;

i) Mean / M*in*

[4 marks]

[*4 markah*]

ii) Median / *Median*

[5 marks]

[*5 markah*]

iii) Mode / *Mod*

[3 marks]

[*3 markah*]

CLO 2

(b) Pearson's Coefficient of Skewness is used to measure the skewness of the distribution. You are required to;

Kecenderungan Koefisen Pearson digunakan untuk mengukur taburan kepencongan. Anda dikehendaki;

i) Calculate the variance and standard deviation for a several of customers within one month.

Hitung varians dan sisihan piawai untuk beberapa pelanggan dalam tempoh satu bulan.

[6 marks]

[*6 markah*]

ii) Determine the type of distribution by computing the Pearson Coefficient of Skewness 2 (PCS 2) and draw the skewness graph.

Berikan jenis taburan dengan mengira Pekali Kepencongan Pearson 2 (PCS 2) dan lukis graf skewness

[4 marks]

[*4 markah*]

iii) Nilofar has launched her new scarf called *Nurlufa* with a mean of 27.36 and a standard deviation of 10.58 within one month.

Ascertain which scarf founder has more consistency to produce a new collection.

Nilofar melancarkan selendang baharunya bernama Nurlufa dengan min 27.3 dan sisihan piawai 10.58 dalam tempoh sebulan.

Pastikan pengasas selendang mana yang lebih konsisten untuk menghasilkan koleksi baharu.

[3 marks]

[*3 markah*]

QUESTION 3

SOALAN 3

CLO 2 (a) 50 people were asked if they have ever been to France or Spain. 18 people have been to France, 23 people have been to Spain and 6 people have been to both. Convert the data to a Venn Diagram to represent the information.

50 orang ditanya samada mereka pernah pergi ke Perancis atau Sepanyol. 18 orang pernah ke Perancis, 23 orang pernah ke Sepanyol dan 6 orang pernah pergi kedua-duanya. Tukar data dalam bentuk gambarajah Venn untuk mewakili maklumat tersebut.

[5 marks]

[*5 markah*]

CLO 2

(b) Zara has opened a new restaurant in Behrang. She wants to know the meal preference of her customers who eat in her restaurant. From her survey, 45% of the customers ordered salad, of which 60% of them also ordered juice. On the contrary, 15% who did not order salad have also ordered juice.

Zara telah membuka restoran baru di Behrang. Dia ingin mengetahui hidangan kegemaran pelanggan yang datang ke restorannya. Melalui tinjauannya, 45% daripada pelanggan memesan salad, dimana 60% daripada mereka juga memesan jus. Sebaliknya, 15% yang tidak memesan salad juga telah memesan jus.

(i) Draw a tree diagram from the information above to show the probability.

Lukis gambarajah pokok berdasarkan maklumat di atas untuk menunjukkan kebarangkalian.

[10 marks]

[*10 markah*]

(ii)   Calculate the probability, if:

    Kirakan kebarangkalian, jika:

    a. a customer orders a salad and juice.

       pelanggan memesan salad dan jus.

    b. a customer order juice.

       pelanggan memesan jus.

    c. a customer orders salad given they ordered juice.

       pelanggan memesan salad, diberi mereka memesan jus.

    d. a customer did not order juice.

       pelanggan tidak memesan jus.

[10 marks]

[*10 markah*]

CLO 2

QUESTION 4

SOALAN 4

CLO 2

(a)   A store manager wishes to find out whether there is a relationship between the age of his employees and the number of sick days they take each year. The data for the sample are shown below. Express the relationship between these variables by using Pearson's product-moment coefficient of correlation and interpret the result.

Pengurus kedai berhasrat untuk mengetahui samada terdapat hubungan antara umur pekerja dan bilangan cuti sakit yang diambil setiap tahun. Data sampel seperti ditunjukkan di bawah. Nyatakan hubungan antara pembolehubah ini dengan menggunakan Pekali korelasi produk-momen Pearson dan tafsirkan hasilnya.

Age/umur, x	18	26	39	48	53	58
Days/hari, y	16	12	9	5	6	2

[12 marks]

[*12 markah*]

(b)   A new laboratory technician reads a report that the average number of students using computer laboratory per hour was 16. To test this hypothesis, he selected a day at random and kept track of the number of students who used the lab over 8 hours. The result was as follows.

Juruteknik makmal baharu membaca laporan bahawa purata bilangan pelajar yang menggunakan makmal komputer sejam ialah 16. Untuk menguji hipotesis ini, dia memilih hari secara rawak dan menjejaki bilangan pelajar yang menggunakan makmal komputer melebihi tempoh 8 jam. Hasilnya adalah seperti berikut.

$$20 \quad 24 \quad 18 \quad 16 \quad 16 \quad 19 \quad 21 \quad 23$$

At $\alpha = 0.05$, run the test to claim that the average is actually 16 with suitable diagram. Given the standard deviation is 2.97.

Pada α = 0.05, jalankan ujian untuk mendakwa bahawa purata sebenar adalah 16 dengan diagram yang sesuai. Diberi sisihan piawai ialah 2.97.

[13 marks]

[*13 markah*]

SOALAN TAMAT

FORMULA STATISTICS

$$k = 1 + 3.3 \log_{10} n$$

$$R = Highest\ value - Lowest\ value$$

$$c = \frac{Range}{k}$$

$$\bar{x} = \frac{\sum fx}{\sum f}$$

$$\tilde{x} = Lm + \left[\frac{\frac{\sum f}{2} - \sum fm^{-1}}{fm}\right] x\ C$$

$$\hat{x} = Lb + \left[\frac{f0 - f1}{(f0 - f1) + (f0 - f2)}\right] x\ C$$

$$\hat{x} = \bar{x} - 3(\bar{x} - \tilde{x})$$

$$MD = \frac{1}{\sum f}\left[\sum f\ (x - \bar{x})\right]$$

$$s^2 = \frac{1}{\sum f - 1}\left[\sum fx^2 - \frac{(\sum fx)^2}{\sum f}\right]$$

$$s = \sqrt{s^2}$$

$$cv = \frac{s}{\bar{x}}\ x\ 100$$

$$PCS\ 1 = \frac{\bar{x} - \hat{x}}{s}$$

$$PCS\ 2 = \frac{3(\bar{x} - \tilde{x})}{s}$$

$$r = \frac{n\sum xy - (\sum x)(\sum y)}{\sqrt{[n\sum x^2 - (\sum x)^2][n\sum y^2 - (\sum y)^2]}}$$

$$p = 1 - \frac{6\sum d^2}{n\ (n^2 - 1)}$$

$$b = \frac{n\sum xy - (\sum x)(\sum y)}{n\sum x^2 - (\sum x)^2}$$

$$a = \frac{\sum y}{n} - b\ \frac{\sum x}{n}$$

$$y = a + bx$$

$$P(A) = \frac{n(A)}{n(S)}$$

$$P(A \cup B) = P(A) + P(B)$$

$$P(A \cap B) = P(A) + P(B) - P(A \cap B)$$

$$P(A|B) = \frac{P(A \cap B)}{P(B)}$$

$$P(B|A) = \frac{P(A \cap B)}{P(A)}$$

$$\bar{x} \pm Z\frac{\alpha}{2}\left(\frac{\sigma}{\sqrt{n}}\right)$$

$$\bar{x} \pm t\frac{\alpha}{2}\left(\frac{s}{\sqrt{n}}\right)$$

$$z = \frac{\bar{x} - \mu}{\frac{\sigma}{\sqrt{n}}}$$

$$t = \frac{\bar{x} - \mu}{\frac{s}{\sqrt{n}}}$$

t Table

cum. prob	$t_{.50}$	$t_{.75}$	$t_{.80}$	$t_{.85}$	$t_{.90}$	$t_{.95}$	$t_{.975}$	$t_{.99}$	$t_{.995}$	$t_{.999}$	$t_{.9995}$
one-tail	0.50	0.25	0.20	0.15	0.10	0.05	0.025	0.01	0.005	0.001	0.0005
two-tails	1.00	0.50	0.40	0.30	0.20	0.10	0.05	0.02	0.01	0.002	0.001
df											
1	0.000	1.000	1.376	1.963	3.078	6.314	12.71	31.82	63.66	318.31	636.62
2	0.000	0.816	1.061	1.386	1.886	2.920	4.303	6.965	9.925	22.327	31.599
3	0.000	0.765	0.978	1.250	1.638	2.353	3.182	4.541	5.841	10.215	12.924
4	0.000	0.741	0.941	1.190	1.533	2.132	2.776	3.747	4.604	7.173	8.610
5	0.000	0.727	0.920	1.156	1.476	2.015	2.571	3.365	4.032	5.893	6.869
6	0.000	0.718	0.906	1.134	1.440	1.943	2.447	3.143	3.707	5.208	5.959
7	0.000	0.711	0.896	1.119	1.415	1.895	2.365	2.998	3.499	4.785	5.408
8	0.000	0.706	0.889	1.108	1.397	1.860	2.306	2.896	3.355	4.501	5.041
9	0.000	0.703	0.883	1.100	1.383	1.833	2.262	2.821	3.250	4.297	4.781
10	0.000	0.700	0.879	1.093	1.372	1.812	2.228	2.764	3.169	4.144	4.587
11	0.000	0.697	0.876	1.088	1.363	1.796	2.201	2.718	3.106	4.025	4.437
12	0.000	0.695	0.873	1.083	1.356	1.782	2.179	2.681	3.055	3.930	4.318
13	0.000	0.694	0.870	1.079	1.350	1.771	2.160	2.650	3.012	3.852	4.221
14	0.000	0.692	0.868	1.076	1.345	1.761	2.145	2.624	2.977	3.787	4.140
15	0.000	0.691	0.866	1.074	1.341	1.753	2.131	2.602	2.947	3.733	4.073
16	0.000	0.690	0.865	1.071	1.337	1.746	2.120	2.583	2.921	3.686	4.015
17	0.000	0.689	0.863	1.069	1.333	1.740	2.110	2.567	2.898	3.646	3.965
18	0.000	0.688	0.862	1.067	1.330	1.734	2.101	2.552	2.878	3.610	3.922
19	0.000	0.688	0.861	1.066	1.328	1.729	2.093	2.539	2.861	3.579	3.883
20	0.000	0.687	0.860	1.064	1.325	1.725	2.086	2.528	2.845	3.552	3.850
21	0.000	0.686	0.859	1.063	1.323	1.721	2.080	2.518	2.831	3.527	3.819
22	0.000	0.686	0.858	1.061	1.321	1.717	2.074	2.508	2.819	3.505	3.792
23	0.000	0.685	0.858	1.060	1.319	1.714	2.069	2.500	2.807	3.485	3.768
24	0.000	0.685	0.857	1.059	1.318	1.711	2.064	2.492	2.797	3.467	3.745
25	0.000	0.684	0.856	1.058	1.316	1.708	2.060	2.485	2.787	3.450	3.725
26	0.000	0.684	0.856	1.058	1.315	1.706	2.056	2.479	2.779	3.435	3.707
27	0.000	0.684	0.855	1.057	1.314	1.703	2.052	2.473	2.771	3.421	3.690
28	0.000	0.683	0.855	1.056	1.313	1.701	2.048	2.467	2.763	3.408	3.674
29	0.000	0.683	0.854	1.055	1.311	1.699	2.045	2.462	2.756	3.396	3.659
30	0.000	0.683	0.854	1.055	1.310	1.697	2.042	2.457	2.750	3.385	3.646
40	0.000	0.681	0.851	1.050	1.303	1.684	2.021	2.423	2.704	3.307	3.551
60	0.000	0.679	0.848	1.045	1.296	1.671	2.000	2.390	2.660	3.232	3.460
80	0.000	0.678	0.846	1.043	1.292	1.664	1.990	2.374	2.639	3.195	3.416
100	0.000	0.677	0.845	1.042	1.290	1.660	1.984	2.364	2.626	3.174	3.390
1000	0.000	0.675	0.842	1.037	1.282	1.646	1.962	2.330	2.581	3.098	3.300
z	0.000	0.674	0.842	1.036	1.282	1.645	1.960	2.326	2.576	3.090	3.291
	0%	50%	60%	70%	80%	90%	95%	98%	99%	99.8%	99.9%
					Confidence Level						

Probability

Table entry for *z* is the area under the standard Normal curve to the left of *z*.
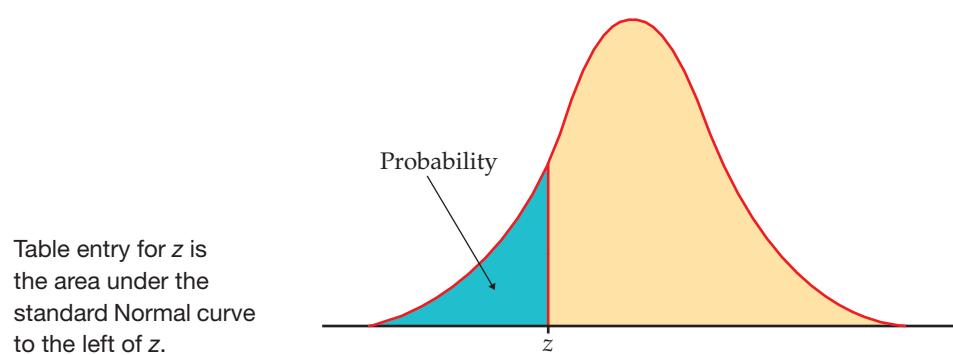
TABLE A

Standard Normal probabilities

z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
−3.4	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0002
−3.3	.0005	.0005	.0005	.0004	.0004	.0004	.0004	.0004	.0004	.0003
−3.2	.0007	.0007	.0006	.0006	.0006	.0006	.0006	.0005	.0005	.0005
−3.1	.0010	.0009	.0009	.0009	.0008	.0008	.0008	.0008	.0007	.0007
−3.0	.0013	.0013	.0013	.0012	.0012	.0011	.0011	.0011	.0010	.0010
−2.9	.0019	.0018	.0018	.0017	.0016	.0016	.0015	.0015	.0014	.0014
−2.8	.0026	.0025	.0024	.0023	.0023	.0022	.0021	.0021	.0020	.0019
−2.7	.0035	.0034	.0033	.0032	.0031	.0030	.0029	.0028	.0027	.0026
−2.6	.0047	.0045	.0044	.0043	.0041	.0040	.0039	.0038	.0037	.0036
−2.5	.0062	.0060	.0059	.0057	.0055	.0054	.0052	.0051	.0049	.0048
−2.4	.0082	.0080	.0078	.0075	.0073	.0071	.0069	.0068	.0066	.0064
−2.3	.0107	.0104	.0102	.0099	.0096	.0094	.0091	.0089	.0087	.0084
−2.2	.0139	.0136	.0132	.0129	.0125	.0122	.0119	.0116	.0113	.0110
−2.1	.0179	.0174	.0170	.0166	.0162	.0158	.0154	.0150	.0146	.0143
−2.0	.0228	.0222	.0217	.0212	.0207	.0202	.0197	.0192	.0188	.0183
−1.9	.0287	.0281	.0274	.0268	.0262	.0256	.0250	.0244	.0239	.0233
−1.8	.0359	.0351	.0344	.0336	.0329	.0322	.0314	.0307	.0301	.0294
−1.7	.0446	.0436	.0427	.0418	.0409	.0401	.0392	.0384	.0375	.0367
−1.6	.0548	.0537	.0526	.0516	.0505	.0495	.0485	.0475	.0465	.0455
−1.5	.0668	.0655	.0643	.0630	.0618	.0606	.0594	.0582	.0571	.0559
−1.4	.0808	.0793	.0778	.0764	.0749	.0735	.0721	.0708	.0694	.0681
−1.3	.0968	.0951	.0934	.0918	.0901	.0885	.0869	.0853	.0838	.0823
−1.2	.1151	.1131	.1112	.1093	.1075	.1056	.1038	.1020	.1003	.0985
−1.1	.1357	.1335	.1314	.1292	.1271	.1251	.1230	.1210	.1190	.1170
−1.0	.1587	.1562	.1539	.1515	.1492	.1469	.1446	.1423	.1401	.1379
−0.9	.1841	.1814	.1788	.1762	.1736	.1711	.1685	.1660	.1635	.1611
−0.8	.2119	.2090	.2061	.2033	.2005	.1977	.1949	.1922	.1894	.1867
−0.7	.2420	.2389	.2358	.2327	.2296	.2266	.2236	.2206	.2177	.2148
−0.6	.2743	.2709	.2676	.2643	.2611	.2578	.2546	.2514	.2483	.2451
−0.5	.3085	.3050	.3015	.2981	.2946	.2912	.2877	.2843	.2810	.2776
−0.4	.3446	.3409	.3372	.3336	.3300	.3264	.3228	.3192	.3156	.3121
−0.3	.3821	.3783	.3745	.3707	.3669	.3632	.3594	.3557	.3520	.3483
−0.2	.4207	.4168	.4129	.4090	.4052	.4013	.3974	.3936	.3897	.3859
−0.1	.4602	.4562	.4522	.4483	.4443	.4404	.4364	.4325	.4286	.4247
−0.0	.5000	.4960	.4920	.4880	.4840	.4801	.4761	.4721	.4681	.4641

Probability

Table entry for z is the
area under the
standard Normal curve
to the left of z.

z
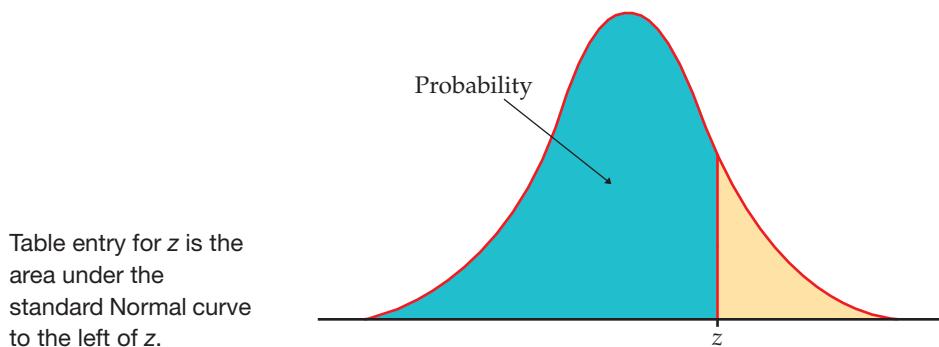
TABLE A

Standard Normal probabilities (continued)

z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
0.0	.5000	.5040	.5080	.5120	.5160	.5199	.5239	.5279	.5319	.5359
0.1	.5398	.5438	.5478	.5517	.5557	.5596	.5636	.5675	.5714	.5753
0.2	.5793	.5832	.5871	.5910	.5948	.5987	.6026	.6064	.6103	.6141
0.3	.6179	.6217	.6255	.6293	.6331	.6368	.6406	.6443	.6480	.6517
0.4	.6554	.6591	.6628	.6664	.6700	.6736	.6772	.6808	.6844	.6879
0.5	.6915	.6950	.6985	.7019	.7054	.7088	.7123	.7157	.7190	.7224
0.6	.7257	.7291	.7324	.7357	.7389	.7422	.7454	.7486	.7517	.7549
0.7	.7580	.7611	.7642	.7673	.7704	.7734	.7764	.7794	.7823	.7852
0.8	.7881	.7910	.7939	.7967	.7995	.8023	.8051	.8078	.8106	.8133
0.9	.8159	.8186	.8212	.8238	.8264	.8289	.8315	.8340	.8365	.8389
1.0	.8413	.8438	.8461	.8485	.8508	.8531	.8554	.8577	.8599	.8621
1.1	.8643	.8665	.8686	.8708	.8729	.8749	.8770	.8790	.8810	.8830
1.2	.8849	.8869	.8888	.8907	.8925	.8944	.8962	.8980	.8997	.9015
1.3	.9032	.9049	.9066	.9082	.9099	.9115	.9131	.9147	.9162	.9177
1.4	.9192	.9207	.9222	.9236	.9251	.9265	.9279	.9292	.9306	.9319
1.5	.9332	.9345	.9357	.9370	.9382	.9394	.9406	.9418	.9429	.9441
1.6	.9452	.9463	.9474	.9484	.9495	.9505	.9515	.9525	.9535	.9545
1.7	.9554	.9564	.9573	.9582	.9591	.9599	.9608	.9616	.9625	.9633
1.8	.9641	.9649	.9656	.9664	.9671	.9678	.9686	.9693	.9699	.9706
1.9	.9713	.9719	.9726	.9732	.9738	.9744	.9750	.9756	.9761	.9767
2.0	.9772	.9778	.9783	.9788	.9793	.9798	.9803	.9808	.9812	.9817
2.1	.9821	.9826	.9830	.9834	.9838	.9842	.9846	.9850	.9854	.9857
2.2	.9861	.9864	.9868	.9871	.9875	.9878	.9881	.9884	.9887	.9890
2.3	.9893	.9896	.9898	.9901	.9904	.9906	.9909	.9911	.9913	.9916
2.4	.9918	.9920	.9922	.9925	.9927	.9929	.9931	.9932	.9934	.9936
2.5	.9938	.9940	.9941	.9943	.9945	.9946	.9948	.9949	.9951	.9952
2.6	.9953	.9955	.9956	.9957	.9959	.9960	.9961	.9962	.9963	.9964
2.7	.9965	.9966	.9967	.9968	.9969	.9970	.9971	.9972	.9973	.9974
2.8	.9974	.9975	.9976	.9977	.9977	.9978	.9979	.9979	.9980	.9981
2.9	.9981	.9982	.9982	.9983	.9984	.9984	.9985	.9985	.9986	.9986
3.0	.9987	.9987	.9987	.9988	.9988	.9989	.9989	.9989	.9990	.9990
3.1	.9990	.9991	.9991	.9991	.9992	.9992	.9992	.9992	.9993	.9993
3.2	.9993	.9993	.9994	.9994	.9994	.9994	.9994	.9995	.9995	.9995
3.3	.9995	.9995	.9995	.9996	.9996	.9996	.9996	.9996	.9996	.9997
3.4	.9997	.9997	.9997	.9997	.9997	.9997	.9997	.9997	.9997	.9998