THE OPEN UNIVERSITY OF SRI LANKA
BACHELOR OF MANAGEMENT STUDIES DEGREE PROGRAMME – LEVEL 05
FINAL EXAMINATION – 2015
QUANTITATIVE TECHNIQUES FOR MANAGEMENT II – MCU 3209
DURATION THREE (03) HOURS

DATE: 27th June 2015	**TIME: 1.30 pm – 4.30pm**

Answer 5 questions only.
Non programmable calculators are allowed.

Question 1

a. Briefly explain the properties of Binomial Distribution. (4 marks)

b. Records provided by the vice president for human resources at a large urban hospital indicate that on any given working day 10% of the nonclinical workforce (i.e. kitchen, housekeeping, electrical, plumbing etc.) are absent from work. What is the probability that in a random sample 12 of nonclinical workers, at least three will be absent? (5 marks)

c. Calculate the expected number and the standard deviation of the above distribution. (3 marks)

d. What is the condition to apply Normal approximation to Binomial distribution? (3 marks)

e. Airlines and hotels often grant reservations in excess of capacity to minimize losses due to no-shows. Suppose the records of a hotel show that on average, 90% of their prospective guests will claim their reservations. If the hotel accepts 215 reservations and there are only 200 rooms in the hotel, what is the probability that all guests who arrive to claim a room will receive one? Use Normal approximation to Binomial distribution. (5 marks)

(Total 20 Marks)

Question 2

a. Based on past records, the average number of two car accidents in a city is 3.4 per day. What is the probability that there will be fewer than two such accidents in this city on a given day? (5 marks)

b. Briefly describe the properties of the Normal distribution. (5 marks)

c. A statistical analysis of long distance telephone calls made from the headquarters of Johnson and Shurgot Corporation indicates that the length of these calls is normally distributed with a mean of 240 seconds and a standard deviation of 40 seconds. How many calls lasted 180 to 300 seconds? (5 marks)

d. The vehicles enter to the entrance at an expressway follow a Poisson distribution with mean vehicles per hour of 25. Find the probability that in 1 hour the vehicles are between 23 and 27 inclusive, using Normal approximation to Poisson distribution. (5 marks)

(Total 20 Marks)

Question 3

a. Describe the following terms:

i. Type I error
ii. Type II error
iii. Point estimation
iv. Interval estimation

(8 marks)

b. An oil company sends out monthly statements to its customers who purchased gasoline and other items using the company's credit card. Until now, the company has not included a pre-addressed envelope for returning payments. The mean number of days before payment is received is 9.8. As an experiment to determine whether enclosing pre-addressed envelopes speeds up payment, 150 customers selected at random were sent pre addressed envelopes with their bills. The sample statistics showed the number of days before payment is received has a mean of 9.16 days and a standard deviation of 2.642 days.

i. Do the data provide sufficient evidence at 5% level of significance to establish that enclosure of preaddressed envelopes improves the average speed of payments? (8 marks)

ii. Find the 95% confidence interval for the mean number of days taken for payment. (4 marks)

(Total 20 marks)

Question 4

a. During the past decade many cigarette smokers have attempted to quit. Unfortunately, nicotine is highly addictive. Smokers employ large number of different methods to help themselves quit. A researcher for the addiction Research Council wanted to determine why some people are able to quit while others who attempted to quit failed. He surveyed 1000 people who planned to quit smoking. He determined their educational level and whether one year later they continued to smoke. The survey results are in the table below.

Education level	Smoker		Total
	Continued to smoke	Quit smoking	
Did not finish school	34	23	57
O/L and A/L	251	212	463
Graduate or professionally qualified	175	305	480
Total	460	540	1000

Can we infer at 5% significance level that the level of education is a factor in determining whether a smoker will quit? (14 marks)

b. Describe the critical region and significance level. (6 marks)

(Total 20 marks)

Question 5

You are a researcher interested in identifying how watching television influences students' performance in school. You found out the average time per week spent to watch television by 10 students and their respective grade averages.

Student No.	Hours of Watching TV	Overall Grade Average
S001	5	80
S002	20	67
S003	6	75
S004	14	70
S005	12	80
S006	1	83
S007	22	56
S008	4	80
S009	10	75
S010	11	70

a. Plot the data on a scatter diagram and interpret the relationship you can observe. (5 marks)

b. Calculate the correlation between time spent to watch television and overall grade average. Interpret the correlation between the two factors? (6 marks)

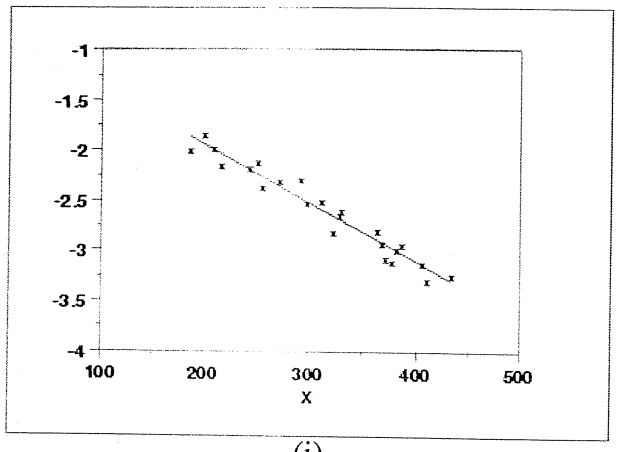
c. Calculate the regression equation (use television watching time to predict grade). (4 marks)

d. If you know that a student watches 11 hours of television a week, what grade would you **predict** for the student? Compare that result with Student No. S010. Why doesn't the regression equation predict the exact score of student No. 10's? (5 marks)

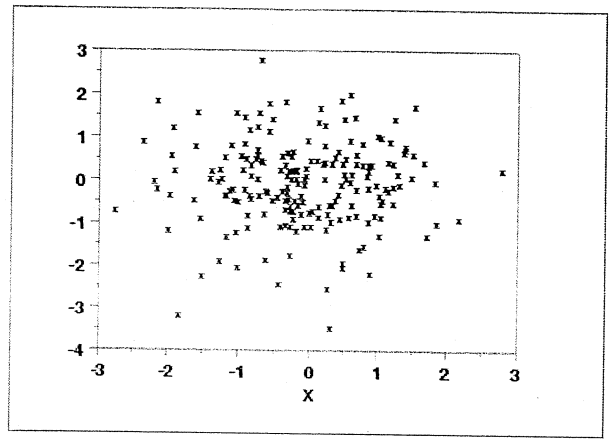
(Total: 20 marks)

Question 6

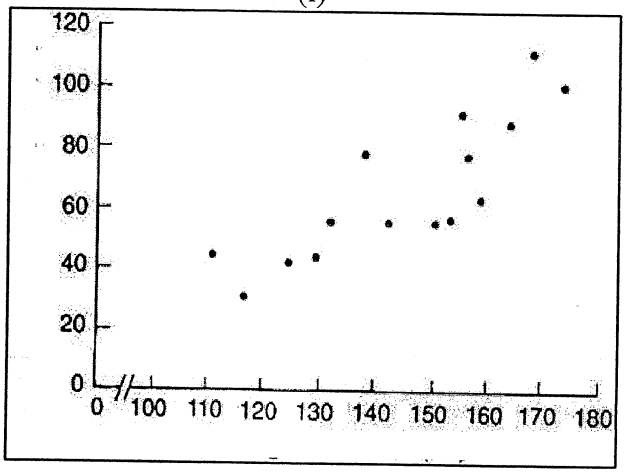
a. Comment on the following scatter plots. (i.e. the relationship and its strength). (8 marks)



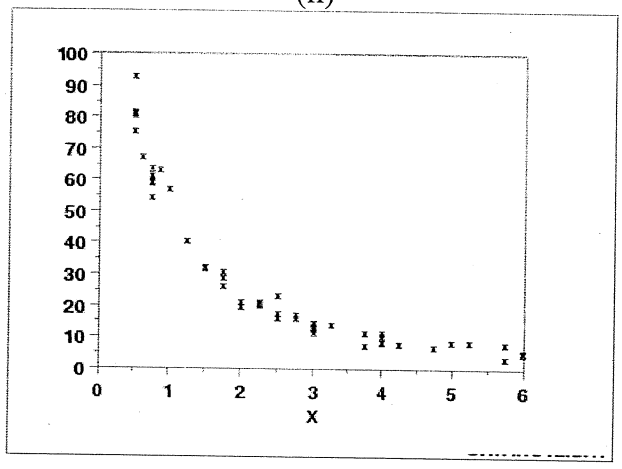
(i)



(ii)



(iii)



(iv)

b. The management of a chain of stores would like to develop a model for predicting the weekly sales (in thousands of rupees) for individual stores based on the 'temperature' and the 'attendance of the sales staff'. A random sample of 15 stores was selected from among all stores in the chain. The data were analysed using a statistical package. The outputs are as follows.

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3373.255	1	3373.255	119.397	.000[a]
	Residual	367.282	13	28.252		
	Total	3740.537	14			

a. Predictors: (Constant), Temperature, Attendance

b. Dependent Variable: Weekly sales (Rs 000s)

The regression equation is:

Weekly sales (in '000s) = 27.445 – 0.082(Temperature) + 0.786 (Attendance)

(i) The management of the company claims that the weekly sales increase with the temperature. Is this statement correct? Justify your answer. (3 marks)

(ii) Interpret the coefficient of the variable of 'attendance'. (Its strength and how it may affect the sales value) (3 marks)

(iii) Estimate the weekly sales value if the temperature is 25 and attendance is 5. (2 marks)

c. Briefly discuss the importance of correlation analysis and regression analysis (4 marks)

(Total: 20 marks)

Question 7

a. The quarterly earnings of a large soft – drink manufacturing company have been recorded for the period 2011 -2014. These data (in millions of Rupees) are shown in the accompanying table.

Year	Quarter	Sales	Centered moving average (quarterly)
2011	1	52	
2011	2	67	
2011	3	85	62.03
2011	4	54	63.38
2012	1	57	66.63
2012	2	75	65.16
2012	3	90	67.99
2012	4	61	70.94
2013	1	60	70.55
2013	2	77	73.61
2013	3	94	71.57
2013	4	63	72.84
2014	1	66	73.68
2014	2	82	76.02
2014	3	98	
2014	4	67	

i. Find the seasonal index values using the moving averages. (5 marks)

ii. Calculate the trend line for the sales data. (6 marks)

iii. Find the forecasted sales for the four quarters of year 2015. (3 marks)

b. What is the purpose of smoothing a time series data? (2 marks)
c. Briefly explain the components of a time series. (4 marks)

(Total: 20 marks)

Cumulative Binomial Probabilities

n	k	0.01	0.05	0.10	0.15	0.20	0.25	0.30	1/3	0.35	0.40	0.45	0.49	0.50
2	0	0.9801	0.9025	0.8100	0.7225	0.6400	0.5625	0.4900	0.4444	0.4225	0.3600	0.3025	0.2601	0.2500
	1	0.0198	0.0950	0.1800	0.2550	0.3200	0.3750	0.4200	0.4444	0.4550	0.4800	0.4950	0.4998	0.5000
	2	0.0001	0.0025	0.0100	0.0225	0.0400	0.0625	0.0900	0.1111	0.1225	0.1600	0.2025	0.2401	0.2500
3	0	0.9703	0.8574	0.7290	0.6141	0.5120	0.4219	0.3430	0.2963	0.2746	0.2160	0.1664	0.1326	0.1250
	1	0.0294	0.1354	0.2430	0.3251	0.3840	0.4219	0.4410	0.4444	0.4436	0.4320	0.4084	0.3823	0.3750
	2	0.0003	0.0071	0.0270	0.0574	0.0960	0.1406	0.1890	0.2222	0.2389	0.2880	0.3341	0.3674	0.3750
	3		0.0001	0.0010	0.0034	0.0080	0.0156	0.0270	0.0370	0.0429	0.0640	0.0911	0.1177	0.1250
4	0	0.9606	0.8145	0.6561	0.5220	0.4096	0.3164	0.2401	0.1975	0.1785	0.1296	0.0915	0.0677	0.0625
	1	0.0388	0.1715	0.2916	0.3685	0.4096	0.4219	0.4116	0.3951	0.3845	0.3456	0.2995	0.2600	0.2500
	2	0.0006	0.0135	0.0486	0.0975	0.1536	0.2109	0.2646	0.2963	0.3105	0.3456	0.3675	0.3747	0.3750
	3		0.0005	0.0036	0.0115	0.0256	0.0469	0.0756	0.0988	0.1115	0.1536	0.2005	0.2400	0.2500
	4			0.0001	0.0005	0.0016	0.0039	0.0081	0.0123	0.0150	0.0256	0.0410	0.0577	0.0625
5	0	0.9510	0.7738	0.5905	0.4437	0.3277	0.2373	0.1681	0.1317	0.1160	0.0778	0.0503	0.0345	0.0313
	1	0.0480	0.2036	0.3281	0.3915	0.4096	0.3955	0.3602	0.3292	0.3124	0.2592	0.2059	0.1657	0.1563
	2	0.0010	0.0214	0.0729	0.1382	0.2048	0.2637	0.3087	0.3292	0.3364	0.3456	0.3369	0.3185	0.3125
	3		0.0011	0.0081	0.0244	0.0512	0.0879	0.1323	0.1646	0.1812	0.2304	0.2757	0.3060	0.3125
	4			0.0004	0.0022	0.0064	0.0147	0.0284	0.0412	0.0488	0.0768	0.1128	0.1470	0.1563
	5				0.0001	0.0003	0.0010	0.0024	0.0041	0.0053	0.0102	0.0185	0.0282	0.0313
6	0	0.9415	0.7351	0.5315	0.3772	0.2622	0.1780	0.1177	0.0878	0.0754	0.0467	0.0277	0.0176	0.0156
	1	0.0571	0.2321	0.3543	0.3993	0.3932	0.3560	0.3025	0.2634	0.2437	0.1866	0.1359	0.1014	0.0938
	2	0.0014	0.0305	0.0984	0.1762	0.2458	0.2966	0.3241	0.3292	0.3280	0.3110	0.2780	0.2437	0.2344
	3		0.0021	0.0146	0.0415	0.0819	0.1318	0.1852	0.2195	0.2355	0.2765	0.3032	0.3121	0.3125
	4		0.0001	0.0012	0.0055	0.0154	0.0330	0.0595	0.0823	0.0951	0.1382	0.1861	0.2249	0.2344
	5			0.0001	0.0004	0.0015	0.0044	0.0102	0.0165	0.0205	0.0369	0.0609	0.0864	0.0938
	6					0.0001	0.0002	0.0007	0.0014	0.0018	0.0041	0.0083	0.0138	0.0156
7	0	0.9321	0.6983	0.4783	0.3206	0.2097	0.1335	0.0824	0.0585	0.0490	0.0280	0.0152	0.0090	0.0078
	1	0.0659	0.2573	0.3720	0.3960	0.3670	0.3115	0.2471	0.2049	0.1848	0.1306	0.0872	0.0604	0.0547
	2	0.0020	0.0406	0.1240	0.2097	0.2753	0.3115	0.3177	0.3073	0.2985	0.2613	0.2140	0.1740	0.1641
	3		0.0036	0.0230	0.0617	0.1147	0.1730	0.2269	0.2561	0.2679	0.2903	0.2918	0.2786	0.2734
	4		0.0002	0.0026	0.0109	0.0287	0.0577	0.0972	0.1280	0.1442	0.1935	0.2388	0.2676	0.2734
	5			0.0002	0.0012	0.0043	0.0115	0.0250	0.0384	0.0466	0.0774	0.1172	0.1543	0.1641
	6				0.0001	0.0004	0.0013	0.0036	0.0064	0.0084	0.0172	0.0320	0.0494	0.0547
	7						0.0001	0.0002	0.0005	0.0006	0.0016	0.0037	0.0068	0.0078
8	0	0.9227	0.6634	0.4305	0.2725	0.1678	0.1001	0.0577	0.0390	0.0319	0.0168	0.0084	0.0046	0.0039
	1	0.0746	0.2793	0.3826	0.3847	0.3355	0.2670	0.1977	0.1561	0.1373	0.0896	0.0548	0.0352	0.0313
	2	0.0026	0.0515	0.1488	0.2376	0.2936	0.3115	0.2965	0.2731	0.2587	0.2090	0.1570	0.1183	0.1094
	3	0.0001	0.0054	0.0331	0.0839	0.1468	0.2076	0.2541	0.2731	0.2786	0.2787	0.2568	0.2273	0.2188
	4		0.0004	0.0046	0.0185	0.0459	0.0865	0.1361	0.1707	0.1875	0.2322	0.2627	0.2730	0.2734
	5			0.0004	0.0026	0.0092	0.0231	0.0467	0.0683	0.0808	0.1239	0.1719	0.2098	0.2188
	6				0.0002	0.0011	0.0039	0.0100	0.0171	0.0217	0.0413	0.0703	0.1008	0.1094
	7					0.0001	0.0004	0.0012	0.0024	0.0033	0.0079	0.0164	0.0277	0.0313
	8							0.0001	0.0002	0.0002	0.0007	0.0017	0.0033	0.0039
n	k	0.01	0.05	0.10	0.15	0.20	0.25	0.30	1/3	0.35	0.40	0.45	0.49	0.50

e. n = 9

k	0.01	0.05	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	0.95	0.99
0	0.914	0.630	0.387	0.134	0.040	0.010	0.002	0.000	0.000	0.000	0.000	0.000	0.000
1	0.997	0.929	0.775	0.436	0.196	0.071	0.020	0.004	0.000	0.000	0.000	0.000	0.000
2	1.000	0.992	0.947	0.738	0.463	0.232	0.090	0.025	0.004	0.000	0.000	0.000	0.000
3		0.999	0.992	0.914	0.730	0.483	0.254	0.099	0.025	0.003	0.000	0.000	0.000
4		1.000	0.999	0.980	0.901	0.733	0.500	0.267	0.099	0.020	0.001	0.000	0.000
5			1.000	0.997	0.975	0.901	0.746	0.517	0.270	0.086	0.008	0.001	0.000
6				1.000	0.996	0.975	0.910	0.768	0.537	0.262	0.053	0.008	0.000
7					1.000	0.996	0.980	0.929	0.804	0.564	0.225	0.071	0.003
8						1.000	0.998	0.990	0.960	0.866	0.613	0.370	0.086
9							1.000	1.000	1.000	1.000	1.000	1.000	1.000

f. n = 10

k	0.01	0.05	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	0.95	0.99
0	0.904	0.599	0.349	0.107	0.028	0.006	0.001	0.000	0.000	0.000	0.000	0.000	0.000
1	0.996	0.914	0.736	0.376	0.149	0.046	0.011	0.002	0.000	0.000	0.000	0.000	0.000
2	1.000	0.988	0.930	0.678	0.383	0.167	0.055	0.012	0.002	0.000	0.000	0.000	0.000
3		0.999	0.987	0.879	0.650	0.382	0.172	0.055	0.011	0.001	0.000	0.000	0.000
4		1.000	0.998	0.967	0.850	0.633	0.377	0.166	0.047	0.006	0.000	0.000	0.000
5			1.000	0.994	0.953	0.834	0.623	0.367	0.150	0.033	0.002	0.000	0.000
6				0.999	0.989	0.945	0.828	0.618	0.350	0.121	0.013	0.001	0.000
7				1.000	0.998	0.988	0.945	0.833	0.617	0.322	0.070	0.012	0.000
8					1.000	0.998	0.989	0.954	0.851	0.624	0.264	0.086	0.004
9						1.000	0.999	0.994	0.972	0.893	0.651	0.401	0.096
10							1.000	1.000	1.000	1.000	1.000	1.000	1.000

g. n = 15

k	0.01	0.05	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	0.95	0.99
0	0.860	0.463	0.206	0.035	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1	0.990	0.829	0.549	0.167	0.035	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2	1.000	0.964	0.816	0.398	0.127	0.027	0.004	0.000	0.000	0.000	0.000	0.000	0.000
3		0.995	0.944	0.648	0.297	0.091	0.018	0.002	0.000	0.000	0.000	0.000	0.000
4		0.999	0.987	0.836	0.515	0.217	0.059	0.009	0.001	0.000	0.000	0.000	0.000
5		1.000	0.998	0.939	0.722	0.403	0.151	0.034	0.004	0.000	0.000	0.000	0.000
6			1.000	0.982	0.869	0.610	0.304	0.095	0.015	0.001	0.000	0.000	0.000
7				0.996	0.950	0.787	0.500	0.213	0.050	0.004	0.000	0.000	0.000
8				0.999	0.985	0.905	0.696	0.390	0.131	0.018	0.000	0.000	0.000
9				1.000	0.996	0.966	0.849	0.597	0.278	0.061	0.002	0.000	0.000
10					0.999	0.991	0.941	0.783	0.485	0.164	0.013	0.001	0.000
11					1.000	0.998	0.982	0.909	0.703	0.352	0.056	0.005	0.000
12						1.000	0.996	0.973	0.873	0.602	0.184	0.036	0.000
13							1.000	0.995	0.965	0.833	0.451	0.171	0.010
14								1.000	0.995	0.965	0.794	0.537	0.140
15									1.000	1.000	1.000	1.000	1.000

$$P(r) = {}^{n}C_r p^r q^{(n-r)}$$

$$P(x) = \frac{e^{-\lambda}\lambda^x}{x!} \text{ where, } e = 2.718$$

$$x - E < \mu < x + E \quad \text{where, } E = Z_{\alpha/2}\ \frac{\sigma}{\sqrt{n}} \text{ or } E = t_{\alpha/2}\ \frac{s}{\sqrt{n}}$$

$$p - E < p < p + E \text{ where, } E = Z\sqrt{\frac{p(1-p)}{n}}$$

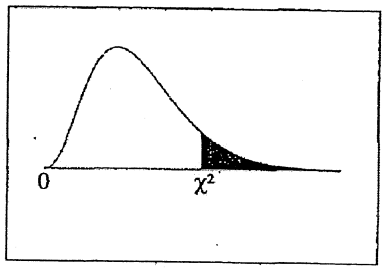
$$\chi^2_{STAT} = \sum_{\text{all cells}} \frac{(f_o - f_e)^2}{f_e}$$

$$r = \frac{\sum xy - \frac{\sum(x).\sum(y)}{n}}{\sqrt{\left(\sum x^2 - \frac{(\sum x)^2}{n}\right)\left(\sum y^2 - \frac{(\sum y)^2}{n}\right)}}$$

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

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

Chi-Square Distribution Table

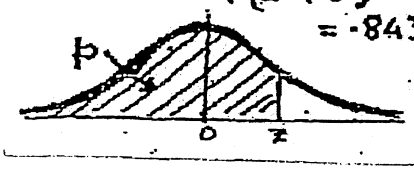


The shaded area is equal to α for $\chi^2 = \chi^2_\alpha$.

df	$\chi^2_{.995}$	$\chi^2_{.990}$	$\chi^2_{.975}$	$\chi^2_{.950}$	$\chi^2_{.900}$	$\chi^2_{.100}$	$\chi^2_{.050}$	$\chi^2_{.025}$	$\chi^2_{.010}$	$\chi^2_{.005}$
1	0.000	0.000	0.001	0.004	0.016	2.706	3.841	5.024	6.635	7.879
2	0.010	0.020	0.051	0.103	0.211	4.605	5.991	7.378	9.210	10.597
3	0.072	0.115	0.216	0.352	0.584	6.251	7.815	9.348	11.345	12.838
4	0.207	0.297	0.484	0.711	1.064	7.779	9.488	11.143	13.277	14.860
5	0.412	0.554	0.831	1.145	1.610	9.236	11.070	12.833	15.086	16.750
6	0.676	0.872	1.237	1.635	2.204	10.645	12.592	14.449	16.812	18.548
7	0.989	1.239	1.690	2.167	2.833	12.017	14.067	16.013	18.475	20.278
8	1.344	1.646	2.180	2.733	3.490	13.362	15.507	17.535	20.090	21.955
9	1.735	2.088	2.700	3.325	4.168	14.684	16.919	19.023	21.666	23.589
10	2.156	2.558	3.247	3.940	4.865	15.987	18.307	20.483	23.209	25.188
11	2.603	3.053	3.816	4.575	5.578	17.275	19.675	21.920	24.725	26.757
12	3.074	3.571	4.404	5.226	6.304	18.549	21.026	23.337	26.217	28.300
13	3.565	4.107	5.009	5.892	7.042	19.812	22.362	24.736	27.688	29.819
14	4.075	4.660	5.629	6.571	7.790	21.064	23.685	26.119	29.141	31.319
15	4.601	5.229	6.262	7.261	8.547	22.307	24.996	27.488	30.578	32.801
16	5.142	5.812	6.908	7.962	9.312	23.542	26.296	28.845	32.000	34.267
17	5.697	6.408	7.564	8.672	10.085	24.769	27.587	30.191	33.409	35.718
18	6.265	7.015	8.231	9.390	10.865	25.989	28.869	31.526	34.805	37.156
19	6.844	7.633	8.907	10.117	11.651	27.204	30.144	32.852	36.191	38.582
20	7.434	8.260	9.591	10.851	12.443	28.412	31.410	34.170	37.566	39.997
21	8.034	8.897	10.283	11.591	13.240	29.615	32.671	35.479	38.932	41.401
22	8.643	9.542	10.982	12.338	14.041	30.813	33.924	36.781	40.289	42.796
23	9.260	10.196	11.689	13.091	14.848	32.007	35.172	38.076	41.638	44.181
24	9.886	10.856	12.401	13.848	15.659	33.196	36.415	39.364	42.980	45.559
25	10.520	11.524	13.120	14.611	16.473	34.382	37.652	40.646	44.314	46.928
26	11.160	12.198	13.844	15.379	17.292	35.563	38.885	41.923	45.642	48.290
27	11.808	12.879	14.573	16.151	18.114	36.741	40.113	43.195	46.963	49.645
28	12.461	13.565	15.308	16.928	18.939	37.916	41.337	44.461	48.278	50.993
29	13.121	14.256	16.047	17.708	19.768	39.087	42.557	45.722	49.588	52.336
30	13.787	14.953	16.791	18.493	20.599	40.256	43.773	46.979	50.892	53.672
40	20.707	22.164	24.433	26.509	29.051	51.805	55.758	59.342	63.691	66.766
50	27.991	29.707	32.357	34.764	37.689	63.167	67.505	71.420	76.154	79.490
60	35.534	37.485	40.482	43.188	46.459	74.397	79.082	83.298	88.379	91.952
70	43.275	45.442	48.758	51.739	55.329	85.527	90.531	95.023	100.425	104.215
80	51.172	53.540	57.153	60.391	64.278	96.578	101.879	106.629	112.329	116.321
90	59.196	61.754	65.647	69.126	73.291	107.565	113.145	118.136	124.116	128.299
100	67.328	70.065	74.222	77.929	82.358	118.498	124.342	129.561	135.807	140.169

00164

P(z=1.01) = .84375



STANDARD NORMAL DISTRIBUTION: Table Values Represent AREA to the LEFT of the Z score.

Z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
0.0	.50000	.50399	.50798	.51197	.51595	.51994	.52392	.52790	.53188	.53586
0.1	.53983	.54380	.54776	.55172	.55567	.55962	.56356	.56749	.57142	.57535
0.2	.57926	.58317	.58706	.59095	.59483	.59871	.60257	.60642	.61026	.61409
0.3	.61791	.62172	.62552	.62930	.63307	.63683	.64058	.64431	.64803	.65173
0.4	.65542	.65910	.66276	.66640	.67003	.67364	.67724	.68082	.68439	.68793
0.5	.69146	.69497	.69847	.70194	.70540	.70884	.71226	.71566	.71904	.72240
0.6	.72575	.72907	.73237	.73565	.73891	.74215	.74537	.74857	.75175	.75490
0.7	.75804	.76115	.76424	.76730	.77035	.77337	.77637	.77935	.78230	.78524
0.8	.78814	.79103	.79389	.79673	.79955	.80234	.80511	.80785	.81057	.81327
0.9	.81594	.81859	.82121	.82381	.82639	.82894	.83147	.83398	.83646	.83891
1.0	.84134	.84375	.84614	.84849	.85083	.85314	.85543	.85769	.85993	.86214
1.1	.86433	.86650	.86864	.87076	.87286	.87493	.87698	.87900	.88100	.88298
1.2	.88493	.88686	.88877	.89065	.89251	.89435	.89617	.89796	.89973	.90147
1.3	.90320	.90490	.90658	.90824	.90988	.91149	.91309	.91466	.91621	.91774
1.4	.91924	.92073	.92220	.92364	.92507	.92647	.92785	.92922	.93056	.93189
1.5	.93319	.93448	.93574	.93699	.93822	.93943	.94062	.94179	.94295	.94408
1.6	.94520	.94630	.94738	.94845	.94950	.95053	.95154	.95254	.95352	.95449
1.7	.95543	.95637	.95728	.95818	.95907	.95994	.96080	.96164	.96246	.96327
1.8	.96407	.96485	.96562	.96638	.96712	.96784	.96856	.96926	.96995	.97062
1.9	.97128	.97193	.97257	.97320	.97381	.97441	.97500	.97558	.97615	.97670
2.0	.97725	.97778	.97831	.97882	.97932	.97982	.98030	.98077	.98124	.98169
2.1	.98214	.98257	.98300	.98341	.98382	.98422	.98461	.98500	.98537	.98574
2.2	.98610	.98645	.98679	.98713	.98745	.98778	.98809	.98840	.98870	.98899
2.3	.98928	.98956	.98983	.99010	.99036	.99061	.99086	.99111	.99134	.99158
2.4	.99180	.99202	.99224	.99245	.99266	.99286	.99305	.99324	.99343	.99361
2.5	.99379	.99396	.99413	.99430	.99446	.99461	.99477	.99492	.99506	.99520
2.6	.99534	.99547	.99560	.99573	.99585	.99598	.99609	.99621	.99632	.99643
2.7	.99653	.99664	.99674	.99683	.99693	.99702	.99711	.99720	.99728	.99736
2.8	.99744	.99752	.99760	.99767	.99774	.99781	.99788	.99795	.99801	.99807
2.9	.99813	.99819	.99825	.99831	.99836	.99841	.99846	.99851	.99856	.99861
3.0	.99865	.99869	.99874	.99878	.99882	.99886	.99889	.99893	.99896	.99900
3.1	.99903	.99906	.99910	.99913	.99916	.99918	.99921	.99924	.99926	.99929
3.2	.99931	.99934	.99936	.99938	.99940	.99942	.99944	.99946	.99948	.99950
3.3	.99952	.99953	.99955	.99957	.99958	.99960	.99961	.99962	.99964	.99965
3.4	.99966	.99968	.99969	.99970	.99971	.99972	.99973	.99974	.99975	.99976
3.5	.99977	.99978	.99978	.99979	.99980	.99981	.99981	.99982	.99983	.99983
3.6	.99984	.99985	.99985	.99986	.99986	.99987	.99987	.99988	.99988	.99989
3.7	.99989	.99990	.99990	.99990	.99991	.99991	.99992	.99992	.99992	.99992
3.8	.99993	.99993	.99993	.99994	.99994	.99994	.99994	.99995	.99995	.99995
3.9	.99995	.99995	.99996	.99996	.99996	.99996	.99996	.99996	.99997	.99997