SVKM
D. J. Sanghvi College of Engineering

Programme: B.TECH (CHEM)/B.TECH (COMP)/B.TECH (DATA SCI.)/B.TECH (ELEX)/B.TECH (EXTC)/B.TECH (IT)/B.TECH (MECH)
Year: IV/Semester VII(Exam Year: 2023-2024)

Subject: Personal Finance Management
Date: 05 Jan 2024 **Time: 09:30 am to 12:30 pm (03:00 Hrs.)**
Max. Marks: 75

FINAL EXAMINATION (Acad. Year:**2023-2024**)

Instructions:
1. This question paper contains 2 pages.
2. This question paper contains two pages.
3. All Questions are Compulsory.
4. All questions carry equal marks.
5. Answer to each new question is to be started on a fresh page.
6. Figures in the brackets on the right indicate full marks.
7. Assume suitable data wherever required, but justify it
8. Draw the neat labelled diagrams, wherever necessary.

Question No.		Max. Marks
Q1.	Attempt **Any Three**	[15]
a	What is the need of financial management?	
b	Explain Equity shares	
c	Explain Money market as a Financial market	
d	What are the advantages and disadvantages of consumer credit?	
Q2	Attempt **Any Three**	[15]
a	What are different types of Mutual funds?	
b	What are the different government schemes for deposits? Explain anyone in detail	
c	Discus what is certificate of deposit	
d	What are the considerations during subscription of life insurance?	
Q3	Attempt **Any Three**	[15]
a	Give the tax slabs as per the current finance bill for individual and HUF.	
b	What type of deductions are allowed from gross total income?	
c	How to Compute the Total Tax Liability?	
~~d~~	What type of deductions are allowed from gross total income?	
e	Write a note on computation of income in case of a house property which is in business or profession of the assesse?	
Q4	Attempt **Any Three**	[15]
a	What are the types of exemptions in GST?	
b	Distinguish between GST and other taxes.	
c	Who are the persons to be considered as distinct persons under the concept of GST?	

d How to decide time of supply of services? Explain with example.

e Mr. Rohit is a retailer. He paid GST of ₹ 6500 at the time of purchase. He collected GST of ₹ 8000 at the time of sale. i. find his input tax and output tax. Ii. What is his input tax credit. Iii. Find his payable GST. Iv. Hence find the payable CGST and payable SGST.

Q5 Attempt **Any Three** [15]

a What is difference between microfinance institutions and commercial banks?

b What are the reasons people take microcredit loans? Give example of each reason.

c List the indicators for Good Self Help Group (SHG)

d Explain Demand & Supply of Microfinance Services in India.

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D. J. Sanghvi College of Engineering

Programme: B.Tech in Computer Engineering
Year: IV/Semester VII(Exam Year: 2023-2024)

Subject: Deep Learning
Date: 08 Jan 2024 **Time: 09:30 am to 12:30 pm (03:00 Hrs.)**
Max. Marks: 75

FINAL EXAMINATION (Acad. Year:**2023-2024**)

Instructions:

1. This question paper contains 2 pages.
2. Answer to each new question to be started on a fresh page.
3. Figure in right hand side indicates full marks
4. Assume suitable data wherever required

Question No.		Max. Marks
Q1 (a)	What is the role of activation functions in deep learning? Explain softmax and ReLu functions in detail. **OR** What is the basic difference between a parameter and a hyper parameter? Why hyper parameter is important in deep learning. Correlate with an example.	[05] [05]
Q1 (b)	What is Batch Normalization? How a batch Norm is fit into a Neural Network?	[10]
Q2 (a)	Explain the problem of exploding and vanishing gradients in RNN with an example. How to know if the model is suffering from the Exploding/Vanishing gradient problem? How can it be tackled? **OR** Draw a simple representation of RNN block. Explain the working in detail. Illustrate the working with an example.	[10] [10]
Q2 (b)	Differentiate between overcomplete and undercomplete autoencoders.	[05]
Q3 (a)	Perform convolution of 5x5 input image (I) with 3x3 kernel (k) by considering Stride=1. What will be the size of resultant image? 5 x 5 Input Image 3 x 3 Kernel	[10]

2	4	7	6	5
9	7	1	2	6
8	3	4	5	7
4	3	3	8	4
5	2	1	1	2

1	0	-1
1	0	-1
1	0	-1

Q3 (a)	**OR** Explain the backward propagation of convolution layer of CNN. Derive the equations for updating Kernel K, Bias B in back propogation.	[10]
Q3 (b)	Explain in brief Back Propagation through Time algorithm. (5 marks)	[05]
Q4 (a)	Identify the deep learning model and elaborate the working of the models with respect to following two applications a) Image recognition b) Language translation	[10]
Q4 (b)	Describe VGG Architecture in detail. OR What are denoising autoencoders.	[05] [05]
Q5 (a)	Write a short note on the following. **(Attempt any two)** i) AlexNet ii) Dropout layer in CNN iii) Deep Vs shallow Network	 [05] [05] [05]
Q5 (b)	Explain the architecture of GRU in detail	[05]

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Programme: B.Tech in Computer Engineering
Year: IV/Semester VII(Exam Year: 2023-2024)
Subject: Digital Signal Processing and Applications
Date: 10 Jan 2024 **Time: 09:30 am to 12:30 pm (03:00 Hrs.)**
Max. Marks: 75

FINAL EXAMINATION (Acad. Year:**2023-2024**)

Instructions:

1. This question paper contains 2 pages.
2. Answer to each new question to be started on a fresh page.
3. Figure in right hand side indicates full marks
4. All Questions are Compulsory

<table>
<tr><th>Question No.</th><th></th><th>Max. Marks</th></tr>
<tr><td>Q1 (a)</td><td>Discuss First Derivative filters used for Edge Detection in detail with Advantages & Disadvantages

OR

Demonstrate how DCT can be used in JPEG Compression Algorithm</td><td>[07]

[07]</td></tr>
<tr><td>Q1 (b)</td><td>Segment given image using Region Growing Technique, consider predicate as, difference between two pixels should be less than or equal to 3 in each region. Discuss disadvantages of this method. Seed pixel is marked with *

<table>
<tr><td>5</td><td>6</td><td>6</td><td>6</td><td>7</td><td>7</td><td>6</td><td>6</td></tr>
<tr><td>6</td><td>7</td><td>6</td><td>7</td><td>5</td><td>5</td><td>4</td><td>7</td></tr>
<tr><td>6</td><td>6</td><td>4</td><td>4</td><td>3</td><td>2</td><td>5</td><td>6</td></tr>
<tr><td>5</td><td>4</td><td>5</td><td>4</td><td>2</td><td>3</td><td>4</td><td>6</td></tr>
<tr><td>0</td><td>3</td><td>2</td><td>3</td><td>3*</td><td>2</td><td>4</td><td>7</td></tr>
<tr><td>0</td><td>0</td><td>0</td><td>0</td><td>2</td><td>2</td><td>5</td><td>6</td></tr>
<tr><td>1</td><td>1</td><td>0</td><td>1</td><td>0</td><td>3</td><td>4</td><td>4</td></tr>
<tr><td>1</td><td>0</td><td>1</td><td>0</td><td>2</td><td>3</td><td>5</td><td>4</td></tr>
</table></td><td>[08]</td></tr>
<tr><td>Q2 (a)</td><td>Justify/ Contradict: Image Quality depends on number of pixels & number of bits used to represent it

OR

Calculate 2 D DFT of an Image
<table>
<tr><td>0</td><td>1</td><td>2</td><td>1</td></tr>
<tr><td>1</td><td>2</td><td>3</td><td>2</td></tr>
<tr><td>2</td><td>3</td><td>4</td><td>3</td></tr>
<tr><td>1</td><td>2</td><td>3</td><td>2</td></tr>
</table></td><td>[05]

[05]</td></tr>
<tr><td>Q2 (b)</td><td>Sketch Input Histogram, Perform Histogram Stretching & Sketch Output Histogram as well as Histogram Stretched Image. Comment on results obtained
<table>
<tr><td>2</td><td>3</td><td>4</td><td>2</td></tr>
<tr><td>5</td><td>5</td><td>2</td><td>4</td></tr>
<tr><td>3</td><td>6</td><td>3</td><td>5</td></tr>
<tr><td>5</td><td>3</td><td>5</td><td>5</td></tr>
</table></td><td>[10]</td></tr>
</table>

Q3 (a)	<table><tr><td>2</td><td>1</td><td>2</td><td>3</td></tr><tr><td>1</td><td>4</td><td>0</td><td>7</td></tr><tr><td>2</td><td>3</td><td>3</td><td>4</td></tr><tr><td>0</td><td>1</td><td>6</td><td>4</td></tr></table> For given Image, Find Image after applying Grey level slicing with & without background considering band between a=3 b=5	[05]
Q3 (b)	Find FFT of **$x_1(n)$=[1,2,3,4,1,2,3,4]** signal using **DIT FFT** Algorithm for **N=8** Hence find $X_2[k]$ if $x_2(n)= x_1(-n)$ without performing FFT **OR** i.Find IDFT of **X[K]=[9,-1+2j,1,-1-2j]** ii.State **Time Shift , Frequency Shift & Convolution** Properties of DFT	[10] [10]
Q4 (a)	Examine if given system is Linear /NonLinear, Variant/Invariant, Causal/Noncausal,Static/Dynamic: **$y(n)=x(n^2)$** **OR** i.Find Linear Convolution :**x(n)={1,3,2,2,-1} & h(n)={1,-1}** ii.Find Auto Correlation : **x1(n)={1,2,-1}**	[05] [05]
Q4 (b)	x(n)={1,2,0,-3,4,5,2,-2} Find i.x(n-2) ii. x(2n-3) iii.x(-n+3) iv.x(-n)u(n) v. $x[\frac{n}{3}]$	[10]
Q5 (a)	i. Examine if given signal is Energy/Power :$x(n)=\left(\frac{1}{2}\right)^n$ ii. Examine Periodic/Aperiodic,if periodic find Time period: $x(n)= 4\sin(\frac{3\pi}{2}n)+ 5\cos(\frac{3\pi}{4}n)$ iii. Find Even & Odd Part of Signal : x(n)={-2,1,2,-1,3} **OR** Illustrate any 4 applications of Signal Processing in detail	[08] [08]
Q5 (b)	Calculate Convolution by Overlap & Add, Overlap & Save method **x(n)={1,2,3,3,4,5 } and h(n)={1,1,1}**	[7]

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Programme: B.Tech in Computer Engineering
Year: IV/Semester VII(Exam Year: 2023-2024)

Subject: Distributed Computing
Date: 12 Jan 2024 **Time: 09:30 am to 12:30 pm (03:00 Hrs.)**
Max. Marks: 75

FINAL EXAMINATION (Acad. Year:**2023-2024**)

Instructions:

1. This question paper contains 1 pages.
2. Answer to each new question to be started on a fresh page.
3. Figure in right hand side indicates full marks
4. Draw neat and labelled diagrams wherever applicable.

Question No.		Max. Marks
Q1 (a)	What is the role of middleware in a distributed system? **OR** Differentiate between Network Operating System (NOS) and Distributed Operating Systems (DOS).	[05] [05]
Q1 (b)	Explain the working of RPC.	[10]
Q2 (a)	Explain Ricart-Agrawala's algorithm in detail with examples. **OR** Explain Group Communication.	[10] [10]
Q2 (b)	List desirable features of the global scheduling algorithm.	[05]
Q3 (a)	Discuss desirable features of the process migration mechanism. **OR** Explain Static Load Balancing algorithm.	[05] [05]
Q3 (b)	Explain Data-centric consistency models with examples. **OR** Explain Client-centric consistency models with examples.	[10] [10]
Q4 (a)	Explain the Bully Election Algorithm. **OR** Explain Raymond's tree-based algorithm.	[05] [05]
Q4 (b)	Explain file caching schemes in detail.	[10]
Q5 (a)	**Solve any two.** i. Compare message-oriented and stream-oriented communication. ii. Compare DFS and NFS. iii. Explain task assignment approaches in resource management.	 [05] [05] [05]
Q5 (b)	Write a short note on Andrew File System (AFS).	[05]

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Programme: B.Tech in Computer Engineering
Year: IV/Semester VII(Exam Year: 2023-2024)
Subject: Bayesian Computing
Date: 15 Jan 2024 **Time: 09:30 am to 12:30 pm (03:00 Hrs.)**
Max. Marks: 75

FINAL EXAMINATION (Acad. Year:**2023-2024**)

Instructions:

1. This question paper contains 5 pages.
2. Answer to each new question to be started on a fresh page.
3. Figure in right hand side indicates full marks
4. Assume suitable data wherever required.

Question No.		Max. Marks
Q1 (a)	For Beta distribution with shape parameter α, scale parameter β, mean μ and standard deviation σ, prove that $\alpha = \frac{\mu^2 - \mu^3}{\sigma^2} - \mu$.	[08]
Q1 (b)	Suppose you have a dataset of exam scores for a class of students: 87, 93, 96, 87, 94, 102, 100, 89, 91, 402 87, 92, 94, 90, 93, 102, 100, 89, 85, 302 Notice that there is an outlier in the dataset (402). Compute i. Traditional Mean ii. Robust Median iii. Compare above two values and provide your analysis on it.	[07]
Q2 (a)	A credit card company wants to determine the mean income of its card holders. It also wants to find out if there are any differences in mean income between males and females. A random sample of 225 male card holders and 190 female card holders was drawn, and the following results were obtained: Mean / Standard Deviation Males: $ 16450 / $3675 Females: $ 13220 / $ 3050 Calculate the 95% confidence intervals for the mean income for males and females. Is there any evidence to suggest that, on average, males' and females' income differ? If so, describe the difference. **OR** In my town, it's rainy one third of the days. Given that it is rainy, there will be heavy traffic with probability **0.5**, and given that it is not rainy, there will be heavy traffic with probability **0.25**. If it's rainy and there is heavy traffic, I arrive late for work with probability **0.5**. On the other hand, the probability of being late is reduced to **0.125** if it is not rainy and there is no heavy traffic. In other situations, (rainy and no traffic, not rainy and traffic) the probability of being late is **0.25**. You pick a random day. i. What is the probability that it's not raining and there is heavy traffic and I am not late? ii. What is the probability that I am late? iii. Given that I arrived late at work, what is the probability that it rained that day?	[10] [10]

<table>
<tr><td>Q2 (b)</td><td>Discuss Bayesian Robustness along with its key points.</td><td>[05]</td></tr>
<tr><td>Q3 (a)</td><td>Explain Gibbs sampling algorithm.
OR
What is the need of MCMC algorithm? Explain MCMC algorithm.</td><td>[10]

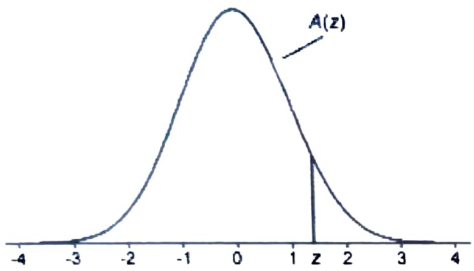
[10]</td></tr>
<tr><td>Q3 (b)</td><td>Write a short note on 'Modeling data with Cauchy errors'.</td><td>[05]</td></tr>
<tr><td>Q4 (a)</td><td>Consider again the NCHS-reported mean total cholesterol level in 2002 for all adults of 203. Suppose a new drug is proposed to lower total cholesterol. A study is designed to evaluate the efficacy of the drug in lowering cholesterol. Fifteen patients are enrolled in the study and asked to take the new drug for 6 weeks. At the end of 6 weeks, each patient's total cholesterol level is measured and the sample statistics are as follows: n=15, $\bar{X}$=195.9 and s=28.7. Is there statistical evidence of a reduction in mean total cholesterol in patients after using the new drug for 6 weeks? (α=5%.)
OR
A food services manager for a baseball park wants to know if there is a relationship between gender (male or female) and the preferred condiment on a hot dog. The following table summarizes the results. Test the hypothesis that gender and condiment are independent with a significance level of 10%.
<table>
<tr><td></td><td colspan="5">Condiment</td></tr>
<tr><td></td><td></td><td>Ketchup</td><td>Mustard</td><td>Relish</td><td>Total</td></tr>
<tr><td>Gender</td><td>Male</td><td>15</td><td>23</td><td>10</td><td>48</td></tr>
<tr><td></td><td>Female</td><td>25</td><td>19</td><td>8</td><td>52</td></tr>
<tr><td></td><td>Total</td><td>40</td><td>42</td><td>18</td><td>100</td></tr>
</table></td><td>[10]

[10]</td></tr>
<tr><td>Q4 (b)</td><td>Explain Exchangeability with its types.
OR
Explain Bayesian Sensitivity Analysis.</td><td>[05]

[05]</td></tr>
<tr><td>Q5 (a)</td><td>Derive Bayesian formulation of Normal Linear Regression. Discuss its use in the Survival Modeling study.</td><td>[10]</td></tr>
<tr><td>Q5 (b)</td><td>Suggest any two applications in which Bayesian Normal linear regression can be used.</td><td>[05]</td></tr>
</table>

TABLE A.1

Cumulative Standardized Normal Distribution



$A(z)$ is the integral of the standardized normal distribution from $-\infty$ to z (in other words, the area under the curve to the left of z). It gives the probability of a normal random variable not being more than z standard deviations above its mean. Values of z of particular importance:

z	$A(z)$	
1.645	0.9500	Lower limit of right 5% tail
1.960	0.9750	Lower limit of right 2.5% tail
2.326	0.9900	Lower limit of right 1% tail
2.576	0.9950	Lower limit of right 0.5% tail
3.090	0.9990	Lower limit of right 0.1% tail
3.291	0.9995	Lower limit of right 0.05% tail

z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	0.5000	0.5040	0.5080	0.5120	0.5160	0.5199	0.5239	0.5279	0.5319	0.5359
0.1	0.5398	0.5438	0.5478	0.5517	0.5557	0.5596	0.5636	0.5675	0.5714	0.5753
0.2	0.5793	0.5832	0.5871	0.5910	0.5948	0.5987	0.6026	0.6064	0.6103	0.6141
0.3	0.6179	0.6217	0.6255	0.6293	0.6331	0.6368	0.6406	0.6443	0.6480	0.6517
0.4	0.6554	0.6591	0.6628	0.6664	0.6700	0.6736	0.6772	0.6808	0.6844	0.6879
0.5	0.6915	0.6950	0.6985	0.7019	0.7054	0.7088	0.7123	0.7157	0.7190	0.7224
0.6	0.7257	0.7291	0.7324	0.7357	0.7389	0.7422	0.7454	0.7486	0.7517	0.7549
0.7	0.7580	0.7611	0.7642	0.7673	0.7704	0.7734	0.7764	0.7794	0.7823	0.7852
0.8	0.7881	0.7910	0.7939	0.7967	0.7995	0.8023	0.8051	0.8078	0.8106	0.8133
0.9	0.8159	0.8186	0.8212	0.8238	0.8264	0.8289	0.8315	0.8340	0.8365	0.8389
1.0	0.8413	0.8438	0.8461	0.8485	0.8508	0.8531	0.8554	0.8577	0.8599	0.8621
1.1	0.8643	0.8665	0.8686	0.8708	0.8729	0.8749	0.8770	0.8790	0.8810	0.8830
1.2	0.8849	0.8869	0.8888	0.8907	0.8925	0.8944	0.8962	0.8980	0.8997	0.9015
1.3	0.9032	0.9049	0.9066	0.9082	0.9099	0.9115	0.9131	0.9147	0.9162	0.9177
1.4	0.9192	0.9207	0.9222	0.9236	0.9251	0.9265	0.9279	0.9292	0.9306	0.9319
1.5	0.9332	0.9345	0.9357	0.9370	0.9382	0.9394	0.9406	0.9418	0.9429	0.9441
1.6	0.9452	0.9463	0.9474	0.9484	0.9495	0.9505	0.9515	0.9525	0.9535	0.9545
1.7	0.9554	0.9564	0.9573	0.9582	0.9591	0.9599	0.9608	0.9616	0.9625	0.9633
1.8	0.9641	0.9649	0.9656	0.9664	0.9671	0.9678	0.9686	0.9693	0.9699	0.9706
1.9	0.9713	0.9719	0.9726	0.9732	0.9738	0.9744	0.9750	0.9756	0.9761	0.9767
2.0	0.9772	0.9778	0.9783	0.9788	0.9793	0.9798	0.9803	0.9808	0.9812	0.9817
2.1	0.9821	0.9826	0.9830	0.9834	0.9838	0.9842	0.9846	0.9850	0.9854	0.9857
2.2	0.9861	0.9864	0.9868	0.9871	0.9875	0.9878	0.9881	0.9884	0.9887	0.9890
2.3	0.9893	0.9896	0.9898	0.9901	0.9904	0.9906	0.9909	0.9911	0.9913	0.9916
2.4	0.9918	0.9920	0.9922	0.9925	0.9927	0.9929	0.9931	0.9932	0.9934	0.9936
2.5	0.9938	0.9940	0.9941	0.9943	0.9945	0.9946	0.9948	0.9949	0.9951	0.9952
2.6	0.9953	0.9955	0.9956	0.9957	0.9959	0.9960	0.9961	0.9962	0.9963	0.9964
2.7	0.9965	0.9966	0.9967	0.9968	0.9969	0.9970	0.9971	0.9972	0.9973	0.9974
2.8	0.9974	0.9975	0.9976	0.9977	0.9977	0.9978	0.9979	0.9979	0.9980	0.9981
2.9	0.9981	0.9982	0.9982	0.9983	0.9984	0.9984	0.9985	0.9985	0.9986	0.9986
3.0	0.9987	0.9987	0.9987	0.9988	0.9988	0.9989	0.9989	0.9989	0.9990	0.9990
3.1	0.9990	0.9991	0.9991	0.9991	0.9992	0.9992	0.9992	0.9992	0.9993	0.9993
3.2	0.9993	0.9993	0.9994	0.9994	0.9994	0.9994	0.9994	0.9995	0.9995	0.9995
3.3	0.9995	0.9995	0.9995	0.9996	0.9996	0.9996	0.9996	0.9996	0.9996	0.9997
3.4	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9998
3.5	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998
3.6	0.9998	0.9998	0.9999							

TABLE A.2

t Distribution: Critical Values of *t*

Degrees of freedom	*Two-tailed test* / *One-tailed test*	*Significance level* 10% / 5%	5% / 2.5%	2% / 1%	1% / 0.5%	0.2% / 0.1%	0.1% / 0.05%
1		6.314	12.706	31.821	63.657	318.309	636.619
2		2.920	4.303	6.965	9.925	22.327	31.599
3		2.353	3.182	4.541	5.841	10.215	12.924
4		2.132	2.776	3.747	4.604	7.173	8.610
5		2.015	2.571	3.365	4.032	5.893	6.869
6		1.943	2.447	3.143	3.707	5.208	5.959
7		1.894	2.365	2.998	3.499	4.785	5.408
8		1.860	2.306	2.896	3.355	4.501	5.041
9		1.833	2.262	2.821	3.250	4.297	4.781
10		1.812	2.228	2.764	3.169	4.144	4.587
11		1.796	2.201	2.718	3.106	4.025	4.437
12		1.782	2.179	2.681	3.055	3.930	4.318
13		1.771	2.160	2.650	3.012	3.852	4.221
14		1.761	2.145	2.624	2.977	3.787	4.140
15		1.753	2.131	2.602	2.947	3.733	4.073
16		1.746	2.120	2.583	2.921	3.686	4.015
17		1.740	2.110	2.567	2.898	3.646	3.965
18		1.734	2.101	2.552	2.878	3.610	3.922
19		1.729	2.093	2.539	2.861	3.579	3.883
20		1.725	2.086	2.528	2.845	3.552	3.850
21		1.721	2.080	2.518	2.831	3.527	3.819
22		1.717	2.074	2.508	2.819	3.505	3.792
23		1.714	2.069	2.500	2.807	3.485	3.768
24		1.711	2.064	2.492	2.797	3.467	3.745
25		1.708	2.060	2.485	2.787	3.450	3.725
26		1.706	2.056	2.479	2.779	3.435	3.707
27		1.703	2.052	2.473	2.771	3.421	3.690
28		1.701	2.048	2.467	2.763	3.408	3.674
29		1.699	2.045	2.462	2.756	3.396	3.659
30		1.697	2.042	2.457	2.750	3.385	3.646
32		1.694	2.037	2.449	2.738	3.365	3.622
34		1.691	2.032	2.441	2.728	3.348	3.601
36		1.688	2.028	2.434	2.719	3.333	3.582
38		1.686	2.024	2.429	2.712	3.319	3.566
40		1.684	2.021	2.423	2.704	3.307	3.551
42		1.682	2.018	2.418	2.698	3.296	3.538
44		1.680	2.015	2.414	2.692	3.286	3.526
46		1.679	2.013	2.410	2.687	3.277	3.515
48		1.677	2.011	2.407	2.682	3.269	3.505
50		1.676	2.009	2.403	2.678	3.261	3.496
60		1.671	2.000	2.390	2.660	3.232	3.460
70		1.667	1.994	2.381	2.648	3.211	3.435
80		1.664	1.990	2.374	2.639	3.195	3.416
90		1.662	1.987	2.368	2.632	3.183	3.402
100		1.660	1.984	2.364	2.626	3.174	3.390
120		1.658	1.980	2.358	2.617	3.160	3.373
150		1.655	1.976	2.351	2.609	3.145	3.357
200		1.653	1.972	2.345	2.601	3.131	3.340
300		1.650	1.968	2.339	2.592	3.118	3.323
400		1.649	1.966	2.336	2.588	3.111	3.315
500		1.648	1.965	2.334	2.586	3.107	3.310
600		1.647	1.964	2.333	2.584	3.104	3.307
∞		1.645	1.960	2.326	2.576	3.090	3.291

Chi-square Distribution Table

d.f.	.995	.99	.975	.95	.9	.1	.05	.025	.01
1	0.00	0.00	0.00	0.00	0.02	2.71	3.84	5.02	6.63
2	0.01	0.02	0.05	0.10	0.21	4.61	5.99	7.38	9.21
3	0.07	0.11	0.22	0.35	0.58	6.25	7.81	9.35	11.34
4	0.21	0.30	0.48	0.71	1.06	7.78	9.49	11.14	13.28
5	0.41	0.55	0.83	1.15	1.61	9.24	11.07	12.83	15.09
6	0.68	0.87	1.24	1.64	2.20	10.64	12.59	14.45	16.81
7	0.99	1.24	1.69	2.17	2.83	12.02	14.07	16.01	18.48
8	1.34	1.65	2.18	2.73	3.49	13.36	15.51	17.53	20.09
9	1.73	2.09	2.70	3.33	4.17	14.68	16.92	19.02	21.67
10	2.16	2.56	3.25	3.94	4.87	15.99	18.31	20.48	23.21
11	2.60	3.05	3.82	4.57	5.58	17.28	19.68	21.92	24.72
12	3.07	3.57	4.40	5.23	6.30	18.55	21.03	23.34	26.22
13	3.57	4.11	5.01	5.89	7.04	19.81	22.36	24.74	27.69
14	4.07	4.66	5.63	6.57	7.79	21.06	23.68	26.12	29.14
15	4.60	5.23	6.26	7.26	8.55	22.31	25.00	27.49	30.58
16	5.14	5.81	6.91	7.96	9.31	23.54	26.30	28.85	32.00
17	5.70	6.41	7.56	8.67	10.09	24.77	27.59	30.19	33.41
18	6.26	7.01	8.23	9.39	10.86	25.99	28.87	31.53	34.81
19	6.84	7.63	8.91	10.12	11.65	27.20	30.14	32.85	36.19
20	7.43	8.26	9.59	10.85	12.44	28.41	31.41	34.17	37.57
22	8.64	9.54	10.98	12.34	14.04	30.81	33.92	36.78	40.29
24	9.89	10.86	12.40	13.85	15.66	33.20	36.42	39.36	42.98
26	11.16	12.20	13.84	15.38	17.29	35.56	38.89	41.92	45.64
28	12.46	13.56	15.31	16.93	18.94	37.92	41.34	44.46	48.28
30	13.79	14.95	16.79	18.49	20.60	40.26	43.77	46.98	50.89
32	15.13	16.36	18.29	20.07	22.27	42.58	46.19	49.48	53.49
34	16.50	17.79	19.81	21.66	23.95	44.90	48.60	51.97	56.06
38	19.29	20.69	22.88	24.88	27.34	49.51	53.38	56.90	61.16
42	22.14	23.65	26.00	28.14	30.77	54.09	58.12	61.78	66.21
46	25.04	26.66	29.16	31.44	34.22	58.64	62.83	66.62	71.20
50	27.99	29.71	32.36	34.76	37.69	63.17	67.50	71.42	76.15
55	31.73	33.57	36.40	38.96	42.06	68.80	73.31	77.38	82.29
60	35.53	37.48	40.48	43.19	46.46	74.40	79.08	83.30	88.38
65	39.38	41.44	44.60	47.45	50.88	79.97	84.82	89.18	94.42
70	43.28	45.44	48.76	51.74	55.33	85.53	90.53	95.02	100.43
75	47.21	49.48	52.94	56.05	59.79	91.06	96.22	100.84	106.39
80	51.17	53.54	57.15	60.39	64.28	96.58	101.88	106.63	112.33
85	55.17	57.63	61.39	64.75	68.78	102.08	107.52	112.39	118.24
90	59.20	61.75	65.65	69.13	73.29	107.57	113.15	118.14	124.12
95	63.25	65.90	69.92	73.52	77.82	113.04	118.75	123.86	129.97
100	67.33	70.06	74.22	77.93	82.36	118.50	124.34	129.56	135.81