



**QUESTION BANK**

Year / Semester: **II B.Tech IV Semester**

Regulation: **R23**

Subject and Code: **STATISTICAL METHODS FOR DATA SCIENCE and 23CSD242T**

**SYLLABUS**

**UNIT I: BASIC CONCEPTS**

Random variables (discrete and continuous), probability density functions, properties, mathematical expectation. Probability distributions: Binomial, Poisson and Normal-their properties. Population, sample, parameter and statistic; characteristics of a good estimator; Consistency – Invariance property of Consistent estimator, Sufficient condition for consistency; Unbiasedness; Sufficiency.

**UNIT 2: POINT ESTIMATION**

Point Estimation- Estimator, Estimate, Methods of point estimation – Maximum likelihood method (the asymptotic properties of ML estimators are not included), Large sample properties of ML estimator (without proof)- applications, Method of moments, method of least squares, method of minimum chi-square and modified minimum chi-square- Asymptotic Maximum Likelihood Estimation and applications

**UNIT 3: INTERVAL ESTIMATION**

Confidence limits and confidence coefficient; Duality between acceptance region of a test and a confidence interval; Construction of confidence intervals for population proportion (small and large samples) and between two population proportions (large samples); Confidence intervals for mean and variance of a normal population; Difference between the mean and ratio of two normal populations.

**UNIT 4: TESTING OF HYPOTHESES**

Types of errors, power of a test, most powerful tests; Neyman-Pearson Fundamental Lemma and its applications; Notion of Uniformly most powerful tests; Likelihood Ratio tests: Description and property of LR tests - Application to standard distributions.

**UNIT 5: SMALL SAMPLE TESTS**

Student's t-test, test for a population mean, equality of two population means, paired t-test, F-test for equality of two population variances, Chi-square test for goodness of fit and test for independence of attributes,  $\chi^2$  test for testing variance of a normal distribution.



**QUESTION BANK**

**Year / Semester: II B.Tech IV Semester**

**Regulation: R23**

**Subject and Code: STATISTICAL METHODS FOR DATA SCIENCE and 23CSD242T**

**Max Marks: 10**

S.No.	CO	Questions	BT																		
<b>Unit I: (BASIC CONCEPTS)</b>																					
1	1	<p>A random variable X has the following probability function</p> <table border="1" style="margin: auto; border-collapse: collapse;"> <tr> <td style="padding: 5px;">x</td> <td style="padding: 5px;">0</td> <td style="padding: 5px;">1</td> <td style="padding: 5px;">2</td> <td style="padding: 5px;">3</td> <td style="padding: 5px;">4</td> <td style="padding: 5px;">5</td> <td style="padding: 5px;">6</td> <td style="padding: 5px;">7</td> </tr> <tr> <td style="padding: 5px;">P(x)</td> <td style="padding: 5px;">0</td> <td style="padding: 5px;">K</td> <td style="padding: 5px;">2K</td> <td style="padding: 5px;">2K</td> <td style="padding: 5px;">3K</td> <td style="padding: 5px;">K<sup>2</sup></td> <td style="padding: 5px;">2K<sup>2</sup></td> <td style="padding: 5px;">7K<sup>2</sup>+K</td> </tr> </table> <p>Determine (i) K (ii) Evaluate P(X &lt;6) and P(X ≥ 6) and P(0 &lt; X &lt; 5) (iii) mean (iv) variance.</p>	x	0	1	2	3	4	5	6	7	P(x)	0	K	2K	2K	3K	K <sup>2</sup>	2K <sup>2</sup>	7K <sup>2</sup> +K	<b>L5</b>
x	0	1	2	3	4	5	6	7													
P(x)	0	K	2K	2K	3K	K <sup>2</sup>	2K <sup>2</sup>	7K <sup>2</sup> +K													
2	1	<p>Probability density function of a random variable X is</p> $f(x) = \begin{cases} \frac{1}{2} \sin x, & \text{for } 0 \leq x \leq \pi \\ 0, & \text{elsewhere} \end{cases}$ <p>Find the mean, mode and median of the distribution and also find the probability between 0 and <math>\frac{\pi}{2}</math></p>	<b>L3</b>																		
3	1	<p><b>a.</b> A fair coin is tossed 6 times. Find the probability of getting four heads using Binomial Distribution</p> <p><b>b.</b> Determine the probability of getting the sum 6 exactly 3 times in 7 throws in with a pair of fair Dice</p>	<b>L3 L5</b>																		
4	1	<p>Fit a Binomial distribution to the following frequency distribution:</p> <table border="1" style="margin: auto; border-collapse: collapse;"> <tr> <td style="padding: 5px;">x</td> <td style="padding: 5px;">0</td> <td style="padding: 5px;">1</td> <td style="padding: 5px;">2</td> <td style="padding: 5px;">3</td> <td style="padding: 5px;">4</td> <td style="padding: 5px;">5</td> </tr> <tr> <td style="padding: 5px;">f</td> <td style="padding: 5px;">2</td> <td style="padding: 5px;">14</td> <td style="padding: 5px;">20</td> <td style="padding: 5px;">34</td> <td style="padding: 5px;">22</td> <td style="padding: 5px;">8</td> </tr> </table>	x	0	1	2	3	4	5	f	2	14	20	34	22	8	<b>L2</b>				
x	0	1	2	3	4	5															
f	2	14	20	34	22	8															
5	1	<p>If the probability that an individual suffers a bad reaction from a certain injection is 0.001. Determine the probability that out of 2000 individuals</p> <p>(i) Exactly 3 (ii) more than 2 individuals (iii) none (iv) more than one individual suffer a bad reaction</p>	<b>L5</b>																		
6	1	<p>Fit a Poisson distribution to the following data and calculate the expected frequencies.</p>	<b>L2</b>																		



**SREENIVASA INSTITUTE OF TECHNOLOGY AND MANAGEMENT STUDIES  
(AUTONOMOUS)**

**QUESTION BANK**

**Year / Semester: II B.Tech IV Semester**

**Regulation: R23**

**Subject and Code: STATISTICAL METHODS FOR DATA SCIENCE and 23CSD242T**

S.No.	CO	Questions	BT																
		<table border="1"> <tr> <td>x</td> <td>0</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> <tr> <td>f</td> <td>109</td> <td>65</td> <td>22</td> <td>3</td> <td>1</td> </tr> </table>	x	0	1	2	3	4	f	109	65	22	3	1					
x	0	1	2	3	4														
f	109	65	22	3	1														
7	1	In a Normal Distribution, 7% of the items are under 35 and 89% are under 63. Determine the mean and Variance of the distribution.	L3																
8	1	If X is a normal Variate with mean 30 and standard Deviation 5. Find the probabilities that (i) $26 \leq X \leq 40$ (ii) $X > 45$	L3																
9	1	What are the Characteristics of Normal Distribution	L1																
10	1	List the Characteristics of Good Estimator and explain	L2																
<b>Unit II: (POINT ESTIMATOR)</b>																			
1	2	Explain the concept of Method of Maximum Likelihood to estimate unknown parameter with example.	L2																
2	2	Explain the Procedure to find unknown parameter in maximum likelihood method.	L2																
3	2	<p>The number of weekly accidents occurring on a mile stretch of a particular road follows Poisson Distribution with parameter <math>\lambda</math> then find the maximum likelihood estimate of parameter <math>\lambda</math> on the basis of the following data:</p> <table border="1"> <tr> <td>Number of accidents</td> <td>0</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>6</td> </tr> <tr> <td>Frequency</td> <td>10</td> <td>12</td> <td>12</td> <td>9</td> <td>5</td> <td>3</td> <td>1</td> </tr> </table>	Number of accidents	0	1	2	3	4	5	6	Frequency	10	12	12	9	5	3	1	L3, L5
Number of accidents	0	1	2	3	4	5	6												
Frequency	10	12	12	9	5	3	1												
4	2	For random sampling from normal population $N(\mu, \sigma^2)$ , find the maximum likelihood estimators for $\mu$ and $\sigma^2$ .	L2																
5	2	a. Obtain the ML estimators for $\alpha$ and $\beta$ for Uniform or rectangular	L3																



**QUESTION BANK**

**Year / Semester: II B.Tech IV Semester**

**Regulation: R23**

**Subject and Code: STATISTICAL METHODS FOR DATA SCIENCE and 23CSD242T**

		<p>population whose pdf is given by <math>f(x) = \begin{cases} \frac{1}{\beta - \alpha}, &amp; \alpha \leq x \leq \beta \\ 0, &amp; \text{elsewhere} \end{cases}</math></p> <p>b. Prove that the ML estimator of <math>\theta</math> for the following distribution  <math>f(x, \theta) = \frac{1}{\theta}; 0 \leq x \leq \theta, \theta &gt; 0</math></p> <p>if the sample values are 1.5, 1.0, 0.7, 2.2, 1.3 and 1.2</p>	
6	2	<p>Prove that for Binomial population with density function  <math>P[X = x] = \binom{n}{x} p^x q^{n-x}, x=1, 2, \dots, n, q=1-p</math></p> <p>The maximum likelihood estimator for p is X/n.</p>	<b>L5</b>
7	2	Explain Method of moments.	<b>L2</b>
8	2	<p>Find the estimator <math>\lambda</math> by the method of moments for the exponential distribution whose probability density function is given by  <math>f(x, \lambda) = \frac{1}{\lambda} e^{-x/\lambda}; x &gt; 0, \lambda &gt; 0</math></p>	<b>L3</b>
9	2	If $X_1, X_2, \dots, X_m$ is a random sample taken from binomial distribution (n, p) where, n and p are unknown, obtain moment estimators for both n and p	<b>L5</b>
10	2	Show that moment estimator and maximum likelihood estimator are same of parameter $\theta$ of the Geometric distribution G( $\theta$ ) whose probability mass function is $P[X = x] = \theta(1 - \theta)^x, \theta > 0, x=0, 1, 2, \dots$	<b>L3</b>
11	2	Explain the method of Least Squares	<b>L2</b>
<b>S.No.</b>	<b>CO</b>	<b>Questions</b>	<b>BT</b>
<b>Unit III: (INTERVAL ESTIMATOR)</b>			
1	3	The mean life of the tyres manufactured by a company follows normal distribution with standard deviation 3200 kms. A sample of 250 tyres is taken and it is found that the average life of the tyres is 50000 kms with a standard deviation of 3500 kms. Establish the 99% confidence interval	<b>L2</b>



**SREENIVASA INSTITUTE OF TECHNOLOGY AND MANAGEMENT STUDIES  
(AUTONOMOUS)**

**QUESTION BANK**

**Year / Semester: II B.Tech IV Semester**

**Regulation: R23**

**Subject and Code: STATISTICAL METHODS FOR DATA SCIENCE and 23CSD242T**

		within which the mean life of tyres of the company is expected to lie.	
2	3	Certain refined oil is packed in tins holding 15 kg each. The filling machine maintains this but have a standard deviation 0.30 kg. A sample of 200 tins is taken from the production line. If sample mean is 15.25 kg, then find the 95% confidence interval for the average weight of oil tins	<b>L3</b>
3	3	Sample mean of weights (in kg) of 150 students of SITAMS is found to be 65 kg with standard deviation 12 kg. Find the 95% confidence limits in which the average weight of all students of SITAMS expected to lie	<b>L3</b>
4	3	It is known that the average height of cadets of a centre follows normal distribution. A sample of 6 cadets of the centre was taken and measured their heights (in inch) which are given below <p style="text-align: center;">70      72      80      82      78      80</p> From this data, estimate the 95% confidence limits for the average height of cadets of the particular centre	<b>L5</b>
5	3	It is known that the average weight of students of a Study Centre of SITAMS follows normal distribution. To estimate the average weight, a sample of 10 students is taken from this Study Centre and measured their weights (in kg) which are given below: 48, 50, 62, 75, 80, 60, 70, 56, 52, 77 Compute the 95% confidence interval for the average weight of students of Study Centre of SITAMS.	<b>L5</b>
6	3	A sample of 200 voters is chosen at random from all voters in a given city. 60% of them were in favor of a particular candidate. If large number of voters cast their votes, then find 99% and 95% confidence intervals for the proportion of voters in favor of a particular candidate.	<b>L5</b>
7	3	A random sample of 400 apples was taken from a large consignment and 80 were found to be bad. Obtain the 99% confidence limits for the proportion of bad apples in the consignment.	<b>L5</b>
8	3	Diameter of steel ball bearing produced by a company is known to be normally distributed. To know the variation in the diameter of steel ball bearings, the product manager takes a random sample of 10 ball bearings	<b>L3</b>



**SREENIVASA INSTITUTE OF TECHNOLOGY AND MANAGEMENT STUDIES  
(AUTONOMOUS)**

**QUESTION BANK**

**Year / Semester: II B.Tech IV Semester**

**Regulation: R23**

**Subject and Code: STATISTICAL METHODS FOR DATA SCIENCE and 23CSD242T**

		<p>from the lot having average diameter 5.0 cm and measures diameter (in cm) of each selected ball bearing. The results are given below:</p> <table border="1"> <tr> <td>S. No.</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>6</td> <td>7</td> <td>8</td> <td>9</td> <td>10</td> </tr> <tr> <td>Diameter</td> <td>5.2</td> <td>5.0</td> <td>5.1</td> <td>5.0</td> <td>5.2</td> <td>4.9</td> <td>5.0</td> <td>5.0</td> <td>5.1</td> <td>5.1</td> </tr> </table> <p>Find the 95% confidence interval for variance in the diameter of steel ball bearings of the lot from which the sample is drawn.</p>	S. No.	1	2	3	4	5	6	7	8	9	10	Diameter	5.2	5.0	5.1	5.0	5.2	4.9	5.0	5.0	5.1	5.1	
S. No.	1	2	3	4	5	6	7	8	9	10															
Diameter	5.2	5.0	5.1	5.0	5.2	4.9	5.0	5.0	5.1	5.1															
9	3	<p>A random sample of 10 workers is taken from a factory. The wages (in hundreds) per months of these workers are given below:</p> <p>48, 50, 62, 75, 80, 60, 70, 56, 52, 77</p> <p>Obtain 95% confidence interval for the variance of wages of all the workers of the factory.</p>	<b>L2</b>																						
10	3	<p>If <math>X_1 = -5, X_2 = 4, X_3 = 2, X_4 = 6, X_5 = -1, X_6 = 4, X_7 = 0, X_8 = 10</math> and <math>X_9 = 7</math> are the sample observations taken from normal population <math>N(\mu, \sigma^2)</math>, obtain confidence interval for <math>\sigma^2</math>.</p>	<b>L2</b>																						

S.No.	CO	Questions	BT
<b>Unit IV: (TESTING OF HYPOTHESES)</b>			
1	4	<p>The frequency function <math>f(x, \theta) = \frac{1}{\theta}, 0 \leq x \leq \theta</math>  <math>= 0, \text{Otherwise}</math></p> <p>Test the null hypothesis <math>H_0: \theta=1</math> against <math>H_1: \theta=2</math>, by the means of single observed value of x. What would be the sizes of the Type-I and Type-II errors, if you choose the interval (i) <math>0.5 \leq x</math> (ii) <math>1 \leq x \leq 1.5</math> as the critical regions.</p> <p>Also find the power of the function of the test</p>	<b>L2</b>



SREENIVASA INSTITUTE OF TECHNOLOGY AND MANAGEMENT STUDIES  
(AUTONOMOUS)

QUESTION BANK

Year / Semester: **II B.Tech IV Semester**

Regulation: **R23**

Subject and Code: **STATISTICAL METHODS FOR DATA SCIENCE and 23CSD242T**

2	4	If $x \geq 1$ is the critical region for testing $H_0: \theta=2$ against the alternative $\theta=1$ , on the basis of the single observation from the population, $f(x, \theta) = \theta e^{-\theta x}$ , $0 \leq x < \infty$ . Obtain the values of Type-I and type-II errors	<b>L3</b>
3	4	Let $P$ be the probability that a coin will fall head in a single toss in order to test $H_0: P=1/2$ against $H_1: 3/4$ . The coin is tossed 5 times and $H_0$ is rejected if more than 3 heads are obtained. Find the probability of Type-I error and power of the test	<b>L3</b>
4	4	Suppose $x$ is a single observation sample from a population with pdf $f(x) = \theta x^{\theta-1}$ for $0 < x < 1$ . Find a test with the best critical region, that is, find the most powerful test with significance level $\alpha=0.05$ for testing the null hypothesis $H_0: \theta=3$ against the alternative hypothesis $H_1: \theta=2$ ,	<b>L5</b>
5	4	Suppose $X_1, X_2, \dots, X_n$ is a random sample from a normal population with mean $\mu$ and variance 16. Find a test with the best critical region, that is, find the most powerful test, with the sample size of 16 and a significance level $\alpha=0.05$ to test the sample null hypothesis $H_0: \mu=10$ against the alternative hypothesis $H_1: \mu=15$ .	<b>L2</b>
6	4	a. Write the procedure to Test for the Mean of a Normal Population b. According to norms established for a mechanical aptitude test, persons who are 18 years old have an average height 73.2 with a S.D. of 8.6. If 4 randomly selected persons of the age averaged 76.7, test the hypothesis $\mu=73.2$ against the alternative hypothesis $\mu > 73.2$ at the 0.01 level of significance	<b>L3</b>
7	4	a. Write the procedure to Test for the Equality of Means of a Normal Population b. Samples of students were drawn from two universities and from their weights in kilograms, mean and S.D.'s are calculated and shown below. Make a large sample test to test the significance of the difference between the means.	<b>L5</b>



**SREENIVASA INSTITUTE OF TECHNOLOGY AND MANAGEMENT STUDIES  
(AUTONOMOUS)**

**QUESTION BANK**

**Year / Semester: II B.Tech IV Semester**

**Regulation: R23**

**Subject and Code: STATISTICAL METHODS FOR DATA SCIENCE and 23CSD242T**

			Mean	S.D.	Size of the Sample	
		University-A	55	10	400	
University-B	57	15	100			

  

8	4	<p>a. Write the procedure for testing of hypothesis for Population Variance</p> <p>b. A random Sample of size 65 screws is taken from a population of big box of screws and measured their length in mm, which gives sample variance 9. Test that the two years old population variance 10.5 is still maintained at present at 5% level of significance</p>	<b>L3</b>
9	4	<p>a. Write the procedure for testing of hypothesis for two Population Variances</p> <p>b. A Comparative study of variation in weights (in pound) of army - soldiers and Navy- Sailors was made. The sample variance of weight of 120 soldiers was 60 pound and sample variance of weight of 160 sailors was 70 pound. Test whether the soldiers and sailors have equal variation in their weights. use 5% level of significance</p>	<b>L2</b>
10	4	<p>a. Write the procedure for testing of hypothesis for the significance for single proportion.</p> <p>b. Random samples of 400 men and 600 women were asked whether they would like to have a flyover near their residence. 200 men and 325 women were favor of the proposal Test the hypothesis that proportions of men a same, at 5% level.</p>	<b>L2</b>

S.No	C O	Questions	B T
<b>Unit V: (SMALL SAMPLE TESTS)</b>			
1	5	A sample of 26 bulbs gives a mean life of 990 hours with a S.D. of 20 hours. The manufacturer claims that the mean life of bulbs is 1000 hours. Is the	



**SREENIVASA INSTITUTE OF TECHNOLOGY AND MANAGEMENT STUDIES  
(AUTONOMOUS)**

**QUESTION BANK**

**Year / Semester: II B.Tech IV Semester**

**Regulation: R23**

**Subject and Code: STATISTICAL METHODS FOR DATA SCIENCE and 23CSD242T**

		sample up to the standard?	<b>L2</b>																						
2	5	The height of 10 members of a given locality is found to be 70,67,62,68,61,68,70,64,64,66 inches. It is reasonable to believe that the average height is greater than 64 inches? Test the 5% level of significance assuming that for 9 degrees of freedom. ( $t=1.833$ at $\alpha=0.05$ )	<b>L3</b>																						
3	5	<p>Samples of Two types of electronic bulbs were tested for length of life and following data were obtained.</p> <table border="1"> <tr> <td>Type-I</td> <td>Type-II</td> </tr> <tr> <td>Sample member=<math>n_1=8</math></td> <td><math>n_2=7</math></td> </tr> <tr> <td>Sample mean=<math>\bar{X}_1=1234</math> hours</td> <td><math>\bar{X}_2=1036</math> hours</td> </tr> <tr> <td>Sample S.D.= 36 hours</td> <td><math>S_2= 40</math> hours</td> </tr> </table> <p>Is the difference in the means sufficient to warrant that type-I is superior to type -II regarding length of life</p>	Type-I	Type-II	Sample member= $n_1=8$	$n_2=7$	Sample mean= $\bar{X}_1=1234$ hours	$\bar{X}_2=1036$ hours	Sample S.D.= 36 hours	$S_2= 40$ hours	<b>L3</b>														
Type-I	Type-II																								
Sample member= $n_1=8$	$n_2=7$																								
Sample mean= $\bar{X}_1=1234$ hours	$\bar{X}_2=1036$ hours																								
Sample S.D.= 36 hours	$S_2= 40$ hours																								
4	5	A group of 5 patients treated with medicine A weight 42,39,48,60 and 41 kgs. Second group of 7 patients from the same hospital treated with medicine B weight 38,42,56,64,68,69 and 62 kgs. Do you agree with the claim that medicine B decreases the weight significantly.	<b>L5</b>																						
5	5	<p>Scores obtained in shooting competition by 10 soldiers before and after intensive training are given below.</p> <table border="1"> <tr> <td>Before</td> <td>67</td> <td>24</td> <td>57</td> <td>55</td> <td>63</td> <td>54</td> <td>56</td> <td>68</td> <td>33</td> <td>43</td> </tr> <tr> <td>After</td> <td>70</td> <td>38</td> <td>58</td> <td>58</td> <td>56</td> <td>67</td> <td>68</td> <td>75</td> <td>42</td> <td>38</td> </tr> </table> <p>Test whether the intensive training is useful at 0.05 level of significance</p>	Before	67	24	57	55	63	54	56	68	33	43	After	70	38	58	58	56	67	68	75	42	38	<b>L2</b>
Before	67	24	57	55	63	54	56	68	33	43															
After	70	38	58	58	56	67	68	75	42	38															
6	5	<p>The blood pressure of 5 women Before and After intake of a certain drug are given below.</p> <table border="1"> <tr> <td>Before</td> <td>110</td> <td>120</td> <td>125</td> <td>132</td> <td>125</td> </tr> <tr> <td>After</td> <td>120</td> <td>118</td> <td>125</td> <td>136</td> <td>121</td> </tr> </table> <p>Test whether there is significant change in blood pressure at 1% level of significance</p>	Before	110	120	125	132	125	After	120	118	125	136	121	<b>L3</b>										
Before	110	120	125	132	125																				
After	120	118	125	136	121																				



**SREENIVASA INSTITUTE OF TECHNOLOGY AND MANAGEMENT STUDIES  
(AUTONOMOUS)**

**QUESTION BANK**

**Year / Semester: II B.Tech IV Semester**

**Regulation: R23**

**Subject and Code: STATISTICAL METHODS FOR DATA SCIENCE and 23CSD242T**

7	5	In one sample of 8 observations from normal population, the sum of the squares of deviations of the sample values from the sample mean is 84.4 and in another sample of 10 observations it was 102.6. Test at 5% level whether the population have the same Variance																							
8	5	<p>The time taken by workers in performing a job by method-I and method-II is given below.</p> <table border="1" style="width: 100%; border-collapse: collapse;"><tbody><tr><td style="text-align: center;">Method-I</td><td style="text-align: center;">20</td><td style="text-align: center;">16</td><td style="text-align: center;">26</td><td style="text-align: center;">27</td><td style="text-align: center;">23</td><td style="text-align: center;">22</td><td style="text-align: center;">-</td></tr><tr><td style="text-align: center;">Method-2</td><td style="text-align: center;">27</td><td style="text-align: center;">33</td><td style="text-align: center;">42</td><td style="text-align: center;">35</td><td style="text-align: center;">32</td><td style="text-align: center;">34</td><td style="text-align: center;">38</td></tr></tbody></table> <p>Do the data show that the variances of time distributions from population from which these samples are drawn do not differ significantly</p>	Method-I	20	16	26	27	23	22	-	Method-2	27	33	42	35	32	34	38	<b>L3</b>						
Method-I	20	16	26	27	23	22	-																		
Method-2	27	33	42	35	32	34	38																		
9	5	The number of automobile accidents per week in a certain community are as follows: 12, 8, 20, 2, 14, 10, 15, 6, 9, 4. Are these frequencies in arrangement with the belief that accident conditions were the same during this 10-week period	<b>L2</b>																						
10	5	<p>The following figures show the distribution of digits in numbers chosen at random from a telephone dictionary</p> <table border="1" style="width: 100%; border-collapse: collapse;"><tbody><tr><td style="text-align: center;">Digits</td><td style="text-align: center;">0</td><td style="text-align: center;">1</td><td style="text-align: center;">2</td><td style="text-align: center;">3</td><td style="text-align: center;">4</td><td style="text-align: center;">5</td><td style="text-align: center;">6</td><td style="text-align: center;">7</td><td style="text-align: center;">8</td><td style="text-align: center;">9</td></tr><tr><td style="text-align: center;">frequency</td><td style="text-align: center;">1026</td><td style="text-align: center;">1107</td><td style="text-align: center;">997</td><td style="text-align: center;">966</td><td style="text-align: center;">1075</td><td style="text-align: center;">933</td><td style="text-align: center;">1107</td><td style="text-align: center;">972</td><td style="text-align: center;">964</td><td style="text-align: center;">853</td></tr></tbody></table>	Digits	0	1	2	3	4	5	6	7	8	9	frequency	1026	1107	997	966	1075	933	1107	972	964	853	<b>L2</b>
Digits	0	1	2	3	4	5	6	7	8	9															
frequency	1026	1107	997	966	1075	933	1107	972	964	853															

**TEXTBOOKS:**

1. Miller and Freunds, Probability and Statistics for Engineers, 7/e, Pearson, 2008.
2. Manoj Kumar Srivastava and Namita Srivastava, Statistical Inference – Testing of Hypotheses, Prentice Hall of India, 2014

**REFERENCE BOOKS:**

1. S.C. Gupta and V.K. Kapoor, Fundamentals of Mathematical Statistics, 11/e, Sultan Chand & Sons Publications, 2012.
2. S. Ross, a First Course in Probability, Pearson Education India, 2002.
3. W. Feller, an Introduction to Probability Theory and its Applications, 1/e, Wiley, 1968.
4. Robert V Hogg, Elliot A Tannis and Dale L. Zimmerman, Probability and Statistical Inference, 9th edition, Pearson publishers, 2013.