<table>
<tr><td>1</td><td>A continuous random variable has the probability density function<br><br>f(x)= $\begin{cases} kxe^{-\lambda x} \; for \; x \geq 0 \; , \boldsymbol{\lambda > 0} \\ 0 \quad else\; where \end{cases}$ determine (i) K (ii) Mean (iii) Variance</td><td>L3</td><td>CO1</td></tr>
<tr><td>2</td><td>Two dice are thrown let X assign to each point(a,b) in S the maximum of its numbers i.e.; X(a,b)= Max(a,b) find the probability distribution .X is a random variable with X(s)={ 1,2,3,4,5,6} also find the mean and variance of the distribution .</td><td>L1</td><td>CO1</td></tr>
<tr><td>3</td><td>Calculate the first four moments of the following distribution about the mean
<table>
<tr><td>X</td><td>0</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></tr>
<tr><td>F</td><td>1</td><td>8</td><td>28</td><td>56</td><td>70</td><td>56</td><td>28</td><td>8</td><td>1</td></tr>
</table></td><td>L4</td><td>CO1</td></tr>
<tr><td>4</td><td>The marks obtained in mathematics by 1000 students is normally distributed with mean 78% and standard deviation on 11% determine (a) how many students got marks above 90% (b) what was the highest marks obtained by the lowest 10% of the students (c) within what limits did the middle of 90% of the students lie.</td><td>L3</td><td>CO2</td></tr>
<tr><td>5</td><td>(a) In a Poisson distribution is such that $P(x=1)\frac{3}{2} = P(x=3)$find<br>(i) $P(X \geq 1)$ (ii) $P(X \leq 3)$<br><br>(b)The mean and variance of a binomial variable $X$ with parameters n and p are 16 and 8 find $P(x \geq 1)\; and\; P(x > 2)$</td><td>L1</td><td>CO2</td></tr>
<tr><td>6</td><td>If the masses of 300 students are normally distributed with mean 68kgs and standard deviation 3kgs how many students have masses (i) greater than 72kg (ii) less than 64kg(iii) between 65Kg and 71kg inclusive</td><td>L1</td><td>CO2</td></tr>
<tr><td>7</td><td>A population consists of the five numbers 3, 4, 7, 9, and 12. Consider all possible samples of size two, which can be drawn with replacement from this population. Find<br><br>(i)the mean of the population<br><br>(ii)the standard deviation of the population<br><br>(iii)the mean of the sampling distribution of means<br><br>(iv)the standard error of means.</td><td>L1</td><td>CO3</td></tr>
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| 8 | **Obtain the rank correlation coefficient for the following data**<br>X: 68 64 75 50 64 80 75 40 55 64<br>Y: 62 58 68 45 81 60 68 48 50 70 | L3 | CO3 |
| 9 | A population consists of six numbers 4,8,12,16,20,24. Consider all samples of size two which can be drawn without replacement from this population, find<br>(i) population mean<br>(ii) population standard deviation<br>(iii) mean of the sampling distribution of means<br>(iv) standard deviation of the sampling distribution of means. | L1 | CO3 |
| 10 | (a) In a hospital 480 females and 520 male babies were born in a week. Do these figures confirm the hypothesis that males and females are born in equal number?<br>(b)Among 900 people in a state 90 are found to be chapati eaters. Construct 99%confidence interval for the true proportion. | L3 | CO4 |
| 11 | The means of two large samples of sizes 1000 and 2000 members are 67.5inchesand 68.0 inches respectively. can the samples be regarded as drawn from the same population of S.D 2.5 inches. | L1 | CO4 |
| 12 | A sample of 400 items is taken from a population with a standard deviation 10.The mean of the sample is 40.Test whether the sample has come from a population with mean 38.Also calculate 95% confidence interval for the population | L4 | CO4 |
| | | | |
| 13 | The IQ s of 16 students from one area of a city showed a mean of 107 with a standard deviation of 10,while the IQ s of 14 students from another area of the city showed a mean of 112 with a standard deviation of 8.Is there a significant difference between the IQs of the groups at a 0.05 level of significance? | L2 | CO5 |
| 14 | The following random samples are measurements of the heat -producing capacity of speciments of coal from two mines:<br>Mine1: 8,260 8,130 8,350 8,070 8,340 ----------<br>Mine2: 7,950 7,890 7,900 8,140 7,920 7,840<br>use the 0.05 level of significance to test whether it is reasonable to assume that the variances of the two population samples are equal. (Tab value =5.19) | L6 | CO5 |

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<td>15</td>
<td>A die is thrown 264 times with the following results. show that the die is biased [Given $\chi^2_{0.05} = 11.07\ for\ 5\ d.f$ ]
<table>
<tr><td>No.appeared on the die</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td></tr>
<tr><td>Frequecy</td><td>40</td><td>32</td><td>28</td><td>58</td><td>54</td><td>52</td></tr>
</table>
</td>
<td>L6</td>
<td>Co5</td>
</tr>
<tr>
<td>16</td>
<td>Four methods are under development for making discs of a superconducting material. fifty discs are made by each method and they are checked for super conductivity when cooled with liquid.
<table>
<tr><td></td><td>1st Method</td><td>2nd Method</td><td>3rd Method</td><td>4th Method</td></tr>
<tr><td>super conductors</td><td>31</td><td>42</td><td>22</td><td>25</td></tr>
<tr><td>Failures</td><td>19</td><td>8</td><td>28</td><td>25</td></tr>
</table>
test the significant difference between the proportions of super conductors at 0.05level</td>
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