# Unit-3

<table>
<tr><th>Q. No.</th><th>Questions</th><th>Marks</th></tr>
<tr><td></td><td>2019-20 (ODD)</td><td></td></tr>
<tr><td>1.</td><td>Find the median of 6, 8, 9, 10, 11, 12, 13.</td><td>2</td></tr>
<tr><td>2.</td><td>The first three central moments of a distribution are 0, 15, -31. Find the moment of coefficient of skewness.</td><td>2</td></tr>
<tr><td>3.</td><td>Find an exponential curve $PV^{\gamma} = k$ for the data:
<table>
<tr><td>V</td><td>50</td><td>100</td><td>150</td><td>200</td></tr>
<tr><td>P</td><td>135</td><td>48</td><td>26</td><td>17</td></tr>
</table></td><td>10</td></tr>
<tr><td>4.</td><td>In a partial destroyed laboratory record of an analysis of correlation data, the following result only are legible :<br>Variance of x = 9, Regression equation: 8x-10y + 66 = 0, 40x -18y = 214.<br>What were (a) the mean value of x and y (b) the standard deviation of y and the co-efficient of correlation between x and y?</td><td>10</td></tr>
<tr><td></td><td>2020-21 (ODD)</td><td></td></tr>
<tr><td>1.</td><td>The first two moments of a distribution about the value ‘2’ of the variable are 1, 16. Show that mean is 3, variance is 15.</td><td>2</td></tr>
<tr><td>2.</td><td>If the regression coefficient is 0.8 and 0.2, What will be the value of coefficient of Correlation?</td><td>2</td></tr>
<tr><td>3.</td><td>Use the Method of Least Squares, find the curve $y = ab^x$ that best fits the following data:
<table>
<tr><td>x</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td></tr>
<tr><td>y</td><td>8.3</td><td>15.4</td><td>33.1</td><td>65.2</td><td>127.4</td></tr>
</table></td><td>10</td></tr>
</table>

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|---|---|---|
| 4. | The following table gives age (x) in years of cars and annual maintenance cost (y) in hundred rupees.<br>x: 1, 3, 5, 7, 9<br>y: 15, 18, 21, 23, 22<br>Calculate the maintenance cost for a 4-year-old car after finding the regression equation. | 10 |
| | **2021-22 (ODD)** | |
| 1. | In an asymmetrical distribution mean is 16 and median is 20. Calculate the mode of the distribution. | 2 |
| 2. | The lines of regression of y on x and x on y are respectively $y = x + 5$ and $16x - 9y = 94$, Find the correlation coefficient. | 2 |
| 3. | Calculate the first four central moments about the mean of the following data:<br>$x$: 0, 1, 2, 3, 4, 5, 6, 7, 8<br>$f$: 1, 8, 28, 56, 70, 56, 28, 8, 1 | 10 |

## 2021-22 (EVEN)

| | | |
|---|---|---|
| 1. | If the regression coefficient are 0.8 and 0.8, what would be the value of coefficient of correlation? | 2 |
| 2. | From the following data, determine the equation of line of regression of $y$ on $x$ and $x$ on $y$.<br>x: 6, 2, 10, 4, 8<br>y: 9, 11, 5, 8, 7 | 10 |
| 3. | Compute skewness and kurtosis, if the first four moments of a frequency distribution about the value 4 of the variable are 1, 4, 10 and 45. | 10 |
| 4. | Use the method of least squares to fit the curve $y = c_0 x + \frac{c}{\frac{1}{\sqrt{x}}}$ for the following data:<br>x: 0.2, 0.3, 0.5, 1, 2<br>y: 16, 14, 11, 6, 3 | 10 |
| | **2022-23 (ODD)** | |
| 1. | Find the arithmetic mean of the following frequency distribution:<br>x: 1, 2, 3, 4, 5, 6, 7<br>f: 5, 9, 12, 17, 14, 10, 6 | 2 |

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<table>
<tr><td>2.</td><td>Write the formula of Karl Pearson correlation coefficient and write the range of correlation coefficient.</td><td>2</td></tr>
<tr><td>3.</td><td>Fit a parabolic curve of second degree to the following data:
<table>
<tr><td>x</td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td></tr>
<tr><td>y</td><td>1</td><td>1.8</td><td>1.3</td><td>2.5</td><td>6.3</td></tr>
</table></td><td>10</td></tr>
<tr><td>4.</td><td>Calculate the correlation coefficient for the following heights (in inches) of fathers (X) and their sons (Y):
<table>
<tr><td>X</td><td>65</td><td>66</td><td>67</td><td>67</td><td>68</td><td>69</td><td>70</td><td>72</td></tr>
<tr><td>Y</td><td>67</td><td>68</td><td>65</td><td>68</td><td>72</td><td>72</td><td>69</td><td>71</td></tr>
</table></td><td></td></tr>
<tr><td>5.</td><td>The first four moments of a distribution about the value 4 of the variable are -1.5, 17, -30 and 80. Find moments $\mu_1, \mu_2, \mu_3, \mu_4$ about mean. Also find $\beta_1$ and $\beta_2$.</td><td></td></tr>
<tr><td></td><td colspan="2">2022-23 (EVEN)</td></tr>
<tr><td>1.</td><td>What is the relation between the regression coefficients and the coefficient of correlation.</td><td>2</td></tr>
<tr><td>2.</td><td>The fourth central moment is 48. What must be its standard deviation in order that the distribution be mesokurtic.</td><td>2</td></tr>
<tr><td>3.</td><td>Use the Method of Least Squares, find the curve $y = ab^x$ that best fits the following data:
<table>
<tr><td>x</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td></tr>
<tr><td>y</td><td>144</td><td>172.8</td><td>207.4</td><td>248.8</td><td>298.5</td></tr>
</table></td><td>10</td></tr>
<tr><td>4.</td><td>If $4x-5y + 33 = 0$ and $20x - 9y = 107$ are two lines of regression. Find the mean values of x and y, the coefficient of correlation and the standard deviation of y if the variance of x is 9.</td><td>10</td></tr>
<tr><td>5.</td><td>First four moments about 2 are 1, 2.5, 5.5 and 16 respectively. Find the first four central moments, moments about origin and coefficient of skewness.</td><td>10</td></tr>
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