Question Paper 2012

Time: 3 Hours    Marks: 100

Note: Attempt any five questions. All questions carry equal marks. Attempt at least two Questions from each section.

SECTION 1

Question No.1
The mid-values of a frequency distribution are given as:

<table>
<thead>
<tr>
<th>Mid Value</th>
<th>115</th>
<th>125</th>
<th>135</th>
<th>145</th>
<th>155</th>
<th>165</th>
<th>175</th>
<th>185</th>
<th>195</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>6</td>
<td>25</td>
<td>48</td>
<td>72</td>
<td>116</td>
<td>60</td>
<td>38</td>
<td>22</td>
<td>2</td>
</tr>
</tbody>
</table>

Calculate:
(i) A.M
(ii) Mode
(iii) Coefficient of Skewness

Question No.2
(a) The number of units produced by a process (x) and the cost of producing unit (y) were made as:

Find:
(i) The coefficient of correlation
(ii) The regression equation of y on x

(b) Construct index number of Prices with the help of following data by:

(i) Laspeyr’s
(ii) Paasche’s
(iii) Fisher’s
(iv) Marshall Edge worth Formula
Commodity & Base Year & Current Year  
<table>
<thead>
<tr>
<th>Commodity</th>
<th>Base Year</th>
<th>Current Year</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Quantity</td>
<td>Price</td>
</tr>
<tr>
<td>A</td>
<td>150</td>
<td>6</td>
</tr>
<tr>
<td>B</td>
<td>180</td>
<td>10</td>
</tr>
<tr>
<td>C</td>
<td>110</td>
<td>16</td>
</tr>
<tr>
<td>D</td>
<td>120</td>
<td>20</td>
</tr>
</tbody>
</table>

Question No. 3

Test independence of two classifications in the following contingency table at 5% level of significance:

<table>
<thead>
<tr>
<th>Attributes</th>
<th>A1</th>
<th>A2</th>
<th>A3</th>
<th>A4</th>
</tr>
</thead>
<tbody>
<tr>
<td>B1</td>
<td>42</td>
<td>72</td>
<td>72</td>
<td>72</td>
</tr>
<tr>
<td>B2</td>
<td>33</td>
<td>62</td>
<td>82</td>
<td>64</td>
</tr>
<tr>
<td>B3</td>
<td>37</td>
<td>121</td>
<td>93</td>
<td>90</td>
</tr>
</tbody>
</table>

(The table value of Chi-Square is 12.59)

Question No. 4

A population consists of five values 2, 4, 6, 8, 10. Take all possible samples of size n = 2 from this population without replacement.

Find:

(i) Mean and Variance for population
(ii) Mean and unbiased Variance of each sample.
(iii) Average of the means of all samples and average of the variances of all samples.
SECTION 2

Question No. 5
If \( A = \begin{pmatrix} 0 & 1 & 3 \\ 1 & 2 & 3 \\ 3 & 1 & 1 \end{pmatrix} \) Then obtain \( A^{-1} \), (Inverse of A)

Question No. 6
(a) Solve for \( X \) the equation:
\[ x = (\sqrt{x + 3}) - 3 \]
(b) Solve the following system of equations:
\[ 9x + 15y = 123 \]
\[ 15x + 93y = 201 \]

Question No. 7
(a) Show that the sum of geometric series of 6 terms;
\[ 1/3, -1/9, 1/27, -1/81 \ldots \ldots \ldots \ldots \text{is } 182/729 \]
(b) The first term, of an AP is 5, the last term 45 and the sum 400. Find number of terms and common difference in the series.

Question No. 8
Mohsin had it note for Rs. 1,5000 with an interest rate of 6%. The note an, dated January 12, 2003 and maturity date was 90 days after date On January 27, 2003, he took the note to his bank, loch discounted it at a discount rate of 7%.

How much did he receive? (Take 360 days in the year)