Question Paper 2015

Time: 3 Hours    Marks: 100

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

SECTION - I

Question No.1
Compute Arithmetic Mean, Median, Variance and Pearson’s Coefficient of Skewness.

<table>
<thead>
<tr>
<th>Monthly Income Rs</th>
<th>No of Families</th>
<th>Monthly Income Rs</th>
<th>No of Families</th>
</tr>
</thead>
<tbody>
<tr>
<td>110-119</td>
<td>2</td>
<td>160-169</td>
<td>18</td>
</tr>
<tr>
<td>120-129</td>
<td>4</td>
<td>170-179</td>
<td>13</td>
</tr>
<tr>
<td>130-139</td>
<td>17</td>
<td>180-189</td>
<td>6</td>
</tr>
<tr>
<td>140-149</td>
<td>28</td>
<td>190-199</td>
<td>5</td>
</tr>
<tr>
<td>150-159</td>
<td>25</td>
<td>200-209</td>
<td>2</td>
</tr>
</tbody>
</table>

Question No.2
(a) Two coins are tossed. Show that the probability of getting at least one head is $\frac{3}{4}$
(b) The results of the use of two drugs in the treatment of a certain disease are as follows

<table>
<thead>
<tr>
<th>Drug - A</th>
<th>Recovered</th>
<th>No Change</th>
<th>Died</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drug - B</td>
<td>50</td>
<td>8</td>
<td>7</td>
</tr>
</tbody>
</table>

Test association using chi-square statistic. Tabulated value of chi-square for 2 degree of freedom at 5% level of significance is 5.99

Question No.3
From the following Data, Compute index number for 2003, taking the price of 2002 as base.
Use Laspeyrie’s, Paasche’s Marshall’s and Fisher’s Formulae:

<table>
<thead>
<tr>
<th>Years</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>9</td>
<td>10</td>
<td>6</td>
<td>80</td>
<td>3</td>
</tr>
<tr>
<td>2003</td>
<td>11</td>
<td>5</td>
<td>9</td>
<td>100</td>
<td>2</td>
</tr>
</tbody>
</table>
Question No. 4
A population consists of six numbers 3, 6, 9, 12, 15 and 18. Consider all possible samples of size n=2, which can be drawn without replacement from this population,

Calculate:

(i) The mean of population
(ii) The standard deviation of population
(iii) The mean of the sampling distribution of means.
(iv) The standard error.

Section – II

Question No.5.
The matrices A and B are given as follows:

If \( A = \begin{pmatrix} 13 & 2 & -6 \\ -3 & 9 & 0 \\ 8 & 4 & -1 \end{pmatrix} \) and \( B = \begin{pmatrix} 11 & -2 & 6 \\ 9 & -14 & 3 \\ -4 & 8 & 5 \end{pmatrix} \)

Obtain: (i) \( A + 2B \) (ii) \( 3A - 4B \) (iii) \( AB \)

Question No. 6

(a) Solve the following simultaneous equations:

\[
\frac{2}{x} + \frac{3}{y} = 2
\]

\[
\frac{8}{x} + \frac{9}{y} = 7
\]

(b) If a car traveled 5 kilometers an hour faster it would take one hour less to travel 210 kilometers. What is the speed of the car and what time does it take.

Question No.7
A drilling company contracted to drill a well at a cost of Rs.30 for the first foot, Rs. 35 for the second foot, Rs. 40 for the third foot and so on. How deep a well can be drilled for Rs. 3,075

Question No.8
Mr. Ahmed deposits Rs. 500 at the end of each quarter. So as to accumulate a sum of Rs. 10,000 to purchase a refrigerator. If the interest rate is 5% per annum compounded quarterly, How many such quarterly deposits he will have to make.