AC-2065
First Year B. A. Examination
April / May – 2015
Elements of Statistics : Paper-II

Time : 3 Hours] [Total Marks : 50

(2) जबल्ली तरक्के अंक के ते प्रश्नां गुण दशकि छ।
(3) आकडेवाश्रीय कोट्स विनंती मे आपवामा आपो।
(4) साहु डेक्सम्युटर वापरी गरिनुहोस।

1 नीलेना प्रश्नामा हुदूका जवाब आपो:
(1) जो प्रश्निकत सङ्केतले प्रमाणः \( Q_3 + Q_1 = 32 \) अन्तः \( Q_3 - Q_1 = 8 \) अन्तः \( M = 18 \) धेरै तो विषमाङ्क शोध।
(2) आकडेवाश्रीय फर्माचे श्रेणी।
(3) नीलेना माध्यमिक परिपरी भूमिका आवश्यक शोध अन्तः भुः अध्याय \( A \) अन्तः भटे \( B \) माध्यमिक संबंध नीस्र धेरै तो संबंधाङ्क शोध।
\( N = 160, (A) = 120, (B) = 106; (AB) = 70 \).
(4) संबंधाण्य आवश्यक माध्यमिक संबंध तकनीकी रीतमा अन्तः भुः तकनीकी संबंध धेरै तो संबंधाङ्क शोध।
(5) प्रश्निकत सङ्केतले नुसार \( n = 10, \overline{x} = 25, \overline{y} = 4, r = 0.8, S_x = 3, S_y = 4 \) धेरै तो \( x \)-दरी \( y \) परिपरी नियमसंबंध रेखा मेर्नु।

2 (अ) समजापूर्वक : (1) वृत्ताण्ड आवृत्ति (2) संबंध आवृत्ति (ब) नीलेना माध्यमिक परिपरी \( x \) अन्तः \( y \) व्ययोप संबंधांशाङ्क आवृत्तिपरसंबंध शीते शोध।

<table>
<thead>
<tr>
<th>( x )</th>
<th>29</th>
<th>30</th>
<th>31</th>
<th>32</th>
<th>34</th>
<th>33</th>
<th>32</th>
<th>28</th>
<th>37</th>
</tr>
</thead>
<tbody>
<tr>
<td>( y )</td>
<td>20</td>
<td>19</td>
<td>21</td>
<td>22</td>
<td>26</td>
<td>22</td>
<td>20</td>
<td>19</td>
<td>30</td>
</tr>
</tbody>
</table>
2. (a) How do you express \( r = \pm 1.0 \) where \(-1 < r < 0\) represent?
(b) If the coefficient of correlation is 0.9 does it mean that the relationship is

<table>
<thead>
<tr>
<th>Class Interval</th>
<th>0-10</th>
<th>10-20</th>
<th>20-30</th>
<th>30-40</th>
<th>40-50</th>
<th>50-60</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coefficient</td>
<td>5</td>
<td>12</td>
<td>28</td>
<td>16</td>
<td>5</td>
<td>4</td>
</tr>
</tbody>
</table>

3. (a) What is the relationship between the variables if \( \text{cov}(x, y) = 40, S_x = 4 \) and \( S_y = 17.5 \)?
(b) If \( n = 10, \sum x = 250, \sum y = 300, \sum xy = 7900, \)
\[ \sum x^2 = 6500, \sum y^2 = 10000 \]

4. (a) What does it mean to say that \( r = 0.6 \)?
(b) If \( n = 25, \sum x = 225, \sum y = 144 \) and \( r = 0.6 \), what does it imply?

5. (a) How do you express \( r = \pm 1 \) and \( r = 0 \)?
(b) If \( N = 500, AB = 120, A = 280, B = 300 \) then find the relationship.
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Instructions: (1) As per the instruction no. 1 of page no. 1.  
(2) Figures to the right indicate full marks of the questions.  
(3) Statistical table will be given on request.  
(4) Simple calculator can be used.

1  Answer the following questions:  
   (1) In usual notations find coefficient of skewness if 
       \( Q_3 + Q_1 = 32 \), \( Q_3 - Q_1 = 8 \) and \( M = 18 \).  
   (2) State the limitations of diagram.  
   (3) Find the missing frequency from the following data and state the 
       type of association between two attributes A and B. 
       \( N = 160 \), \( (A) = 120 \), \( (B) = 106 \); \( (AB) = 70 \).  
   (4) If in the method of concurrent deviation to study 
       correlation the differences are all concurrent then find 
       correlation coefficient.  
   (5) In usual notations \( n = 10 \), \( \bar{x} = 25 \), \( \bar{y} = 4 \), \( r = 0.8 \), \( S_x = 3 \), 
       \( S_y = 4 \) then obtain the equation of regression line of \( x \) 
       on \( y \).  

2  (a) Explain:  
   (1) Angular diagram  
   (2) Cumulative frequency curve.  
   (b) Find the correlation coefficient of \( x \) and \( y \) by Karl 
       Pearson's method from the following data:

       \[
       \begin{array}{c|cccccccc}
       x & 29 & 30 & 31 & 32 & 34 & 33 & 32 & 28 & 37 \\
       y & 20 & 19 & 21 & 22 & 26 & 22 & 20 & 19 & 30 \\
       \end{array}
       \]

       OR

2  (a) What is correlation coefficient? Explain \( r = \pm 1, 0 \) 
   and \( -1 < r < 0 \).  
   (b) Draw cumulative frequency curve for the following 
       data and from that obtain median.  

       \[
       \begin{array}{c|c|c|c|c|c|c|c|c}
       \text{Class} & 0-10 & 10-20 & 20-30 & 30-40 & 40-50 & 50-60 \\
       \text{Frequency} & 5 & 12 & 28 & 16 & 5 & 4 \\
       \end{array}
       \]

   (c) If \( \text{cov}(x, y) = -40 \), \( S_x = 4 \) and \( S_y = 17.5 \) then find \( r \).  

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[Contd...
3. (a) What is regression coefficient? State its characteristics.
(b) Obtain the two regression lines from the following data. Estimate the value of $y$ when $x = 28$.

\[ n = 10, \sum x = 250, \sum y = 300, \sum xy = 7900, \]
\[ \sum x^2 = 6500, \sum y^2 = 10,000 \]

**OR**

3. (a) What is Skewness? State the determine tests of skewness.
(b) Obtain the two lines of regression from the following data. Estimate the value of $y$ when $x = 42$ and $x$ when $y = 75$.

<table>
<thead>
<tr>
<th>$x$</th>
<th>$y$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>35</td>
</tr>
<tr>
<td>Variance</td>
<td>225</td>
</tr>
<tr>
<td>$r$</td>
<td>0.6</td>
</tr>
</tbody>
</table>

4. (a) Explain the importance of statistical diagram.
(b) There are 214 expert workers out of 400 workers in a factory. The total number of trained workers were 150, from then 42 workers were not expert. Obtain Yule's coefficient of correlation between training and expertness.

**OR**

4. (a) What is coefficient of association? Interpret $Q = \pm 1$ and 0.
(b) Draw a histogram for the following data:

<table>
<thead>
<tr>
<th>Class</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 20</td>
<td>5</td>
</tr>
<tr>
<td>20 - 40</td>
<td>10</td>
</tr>
<tr>
<td>40 - 60</td>
<td>20</td>
</tr>
<tr>
<td>60 - 80</td>
<td>30</td>
</tr>
<tr>
<td>80 - 100</td>
<td>25</td>
</tr>
<tr>
<td>100 - 120</td>
<td>10</td>
</tr>
</tbody>
</table>

(c) Determine the types of association between two attributes $A$ and $B$ by proportion method from the following data:

\[ N = 500, (A\beta) = 120, (A) = 280, (B) = 300. \]