III Semester B.Com. Examination, November/December 2017
(Semester Scheme) (2015-16 and Onwards) (CBCS) (F + R)
COMMERCE

3.6 : Quantitative Analysis for Business Decisions – II

Time : 3 Hours
Max. Marks : 70

Instructions: Answers should be written completely either in English or in Kannada.

SECTION – A

1. Answer any five sub-questions. Each sub-question carries two marks. (5×2=10)

a) What do you mean by correlation?

b) If \( b_{xy} = -0.36 \), \( b_{yx} = -1.38 \), obtain ‘r’.

\( b_{xy} = -0.36 \), \( b_{yx} = -1.38 \), \( r = \frac{b_{xy} \cdot b_{yx}}{ \sqrt{b_{xy}^2 \cdot b_{yx}^2} } \).

c) Write the meaning of irregular variations.

\( \text{Irregular variations} = \text{Variations which do not follow a regular pattern} \).

d) Expand \( (y - 1)^6 = 0 \).

\( (y - 1)^6 = y^6 - 6y^5 + 15y^4 - 20y^3 + 15y^2 - 6y + 1 \).

e) What is meant by multi-stage sampling?

\( \text{Multi-stage sampling} = \text{A sampling method where the sampling is done in stages} \).

f) Mention methods of sampling.

\( \text{Methods of sampling} = \text{Random sampling, stratified sampling, cluster sampling, systematic sampling, etc.} \).

g) What is probability?

\( \text{Probability} = \text{A measure of the likelihood of an event occurring} \).
SECTION – B

Answer any three questions from the following. Each question carries six marks. \((3 \times 6 = 18)\)

2. Ranks given in a music contest assigned by two judges are given below:

Judge A: 4 5 8 6 7 3 1 2
Judge B: 7 5 4 1 3 2 6 8

Calculate rank correlation.

3. Calculate the two regression equations from the following data:

\(\bar{x} = 20, \bar{y} = 12, \sigma_x = 5, \sigma_y = 25, r = 0.8.\)

4. Estimate the population of India for the year 2021 using Binomial expansion method from the following data:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Population (in crores)</td>
<td>43.9</td>
<td>54.8</td>
<td>68.4</td>
<td>89</td>
<td>100</td>
<td>111</td>
</tr>
</tbody>
</table>

2021'ನ ಇತರ ಜನಸಂಖ್ಯೆಯನ್ನು ಹುಟ್ಟಿಕೊಳ್ಳುವ ಸಾಮರ್ಥ್ಯಕ್ಕೆ ಸೇರಿರುವ ವೆಬ್‌ಪ್ಲೇಟ್‌ನ ಸಂಕೇತಗಳು.
5. A man wants to check the inventory records against the physical inventories by a sample survey, permitted deviation is ±5 and standard deviation is 39.4. Find the sample size, if the confidence level is 90% (Value of confidence co-efficient 90% = 1.64).

6. Two unbiased dice are thrown. Find the probability that
   a) both the dice show the same digits
   b) the first die shows 5.

SECTION C

Answer any three questions from the following. Each question carries fourteen marks.

7. Compute Pearson’s correlation co-efficient for the following data and also calculate the probable error.

<table>
<thead>
<tr>
<th>Supply (in quintals)</th>
<th>30</th>
<th>29</th>
<th>29</th>
<th>25</th>
<th>24</th>
<th>24</th>
<th>24</th>
<th>21</th>
<th>18</th>
<th>15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price (in ₹)</td>
<td>11</td>
<td>12</td>
<td>13</td>
<td>14</td>
<td>15</td>
<td>16</td>
<td>17</td>
<td>18</td>
<td>20</td>
<td>19</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Supply (in quintals)</th>
<th>30</th>
<th>29</th>
<th>29</th>
<th>25</th>
<th>24</th>
<th>24</th>
<th>24</th>
<th>21</th>
<th>18</th>
<th>15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price (in ₹)</td>
<td>11</td>
<td>12</td>
<td>13</td>
<td>14</td>
<td>15</td>
<td>16</td>
<td>17</td>
<td>18</td>
<td>20</td>
<td>19</td>
</tr>
</tbody>
</table>
8. Calculate trend values by the method of least-squares from the data given below:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales (Rs. lakhs)</td>
<td>76</td>
<td>80</td>
<td>130</td>
<td>144</td>
<td>138</td>
<td>120</td>
<td>174</td>
<td>190</td>
</tr>
</tbody>
</table>

Plot the values on a graph. Also estimate the sales for 2017.

9. The heights (in inches) of a group of fathers and sons are given below:

<table>
<thead>
<tr>
<th>Height of fathers</th>
<th>71</th>
<th>68</th>
<th>66</th>
<th>67</th>
<th>70</th>
<th>71</th>
<th>70</th>
<th>73</th>
<th>72</th>
<th>65</th>
<th>66</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height of sons</td>
<td>69</td>
<td>64</td>
<td>65</td>
<td>63</td>
<td>65</td>
<td>62</td>
<td>65</td>
<td>64</td>
<td>66</td>
<td>69</td>
<td>62</td>
</tr>
</tbody>
</table>

Find the lines of regression and estimate the height of son when the height of father is 69 inches.

10. Below are the data relating to wages earned by workers per day in a certain factory. Calculate the number of workers earning more than ₹ 75 per day by applying Newton's method.

<table>
<thead>
<tr>
<th>Daily wages (₹) upto</th>
<th>50</th>
<th>60</th>
<th>70</th>
<th>80</th>
<th>90</th>
<th>100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of workers</td>
<td>50</td>
<td>150</td>
<td>300</td>
<td>500</td>
<td>700</td>
<td>800</td>
</tr>
</tbody>
</table>

11. Estimate the production for the years 2013 and 2015 with the help of the following data:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Production (in '000 tonnes)</td>
<td>200</td>
<td>220</td>
<td>260</td>
<td>?</td>
<td>350</td>
<td>?</td>
<td>430</td>
</tr>
</tbody>
</table>

Production (in '000 tonnes) : 200 220 260 ? 350 ? 430
III Semester B.Com. Examination, November/December 2016
(2015-16 & Onwards) (CBCS) (F+R)
COMMERCE
3.6: Quantitative Analysis for Business Decision – II

Time: 3 Hours  Max. Marks: 70

Instructions: Answers should be written completely either in English or in Kannada.

SECTION – A

1. Answer any five sub-questions. Each sub question carries two marks. (5x2=10)

a) What is meant by perfect correlation?
   ಪ್ರಮುಖತೆಯ ಸರಳ ಸಮಾಧ್ಯಮಕ್ಕೆ ಸಮಾಧ್ಯಮಕಾರಿಯು ಎಕರ್ನುತ್ತದೆ?

b) State the assumptions of interpolation.
   “ಸೆಷನ್” ಸ್ಪೂರ್ತಿ ವಿಧಾನ ಸಂತತಿಯನ್ನು ಎದುರುತ್ತದೆ.

c) State the components of time series.
   “ಬಾರಿ” ಪರಿಪಾಲಿಸಣ ವಿದೇಶಕಹೇಗಳಾಗಿ ಎಂಬುದು.

d) If bxy = 1.2, byx = 0.8, obtain ‘r’.
   ಅನುಕ್ರಮವಾಗಿ ಅಡುಗೆ ಎಂಬತ್ತ ಎಂಬತ್ತ ಎಂಬತ್ತ.

e) State any two merits of sampling.
   ಆರೋಗ್ಯಕ್ಕೆ ಆರೋಗ್ಯದ ಎಂಬತ್ತ.

f) What are mutually exclusive events?
   ಎಂದರೆ ಏಕದ ವಿದ್ಯಾರ್ಥಿ ಎಂಬತ್ತ.

g) Distinguish between ‘parameter’ and ‘statistic’.
   “ಪರಾಮಾಣು” ಎಂಬತ್ತ “ಸ್ಥಿರಭಾಗ” ಎಂಬತ್ತ ಎಂಬತ್ತ.

SECTION – B

Answer any three questions from the following. Each question carries six marks. (3x6=18)

2. It is known that the population S.D in waiting time for new gas connection in a particular town is 25 days. How large a sample should be chosen with an allowable error of 6 days of the true average waiting time, at 95% confidence level? (Z value at 95% confidence level = 1.96).
   ಪ್ರಮುಖತೆಯ ಸರಳ ಸಮಾಧ್ಯಮಕ್ಕೆ ಸಮಾಧ್ಯಮಕಾರಿಯು ಎಕರ್ನುತ್ತದೆ?
   25 ಅಡುಗೆ ಎಂಬತ್ತ 95% ಎಂಬತ್ತ, ಎಂಬತ್ತಅಡುಗೆ ಎಂಬತ್ತ. 6 ಅಡುಗೆ ಎಂಬತ್ತ ಎಂಬತ್ತ, ಎಂಬತ್ತಅಡುಗೆ ಎಂಬತ್ತ?
   (ಇಂದಕ್ಕೆ: ಅಡುಗೆ ಎಂಬತ್ತ 95% ಎಂಬತ್ತ = 1.96).

P.T.O.
3. A single card is chosen at random from a standard deck of 52 playing cards. What is the probability of choosing
   a) A king or a club?
   b) A king or a queen?

4. Find the index number for 2006 from the following table of index numbers, using binomial expansion method.

<table>
<thead>
<tr>
<th>Year</th>
<th>2004</th>
<th>2005</th>
<th>2007</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Index No.</td>
<td>100</td>
<td>107</td>
<td>157</td>
<td>212</td>
</tr>
</tbody>
</table>

5. The following table shows the mean and standard deviation of prices of two shares in a stock exchange.

<table>
<thead>
<tr>
<th>Shares</th>
<th>Mean (in Rs.)</th>
<th>Standard deviation (in Rs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Ltd.</td>
<td>39.5</td>
<td>10.8</td>
</tr>
<tr>
<td>B Ltd.</td>
<td>47.5</td>
<td>16</td>
</tr>
</tbody>
</table>

If the correlation coefficient between the prices of two shares is 0.42, find the most likely price of share A Ltd., corresponding to price of Rs. 55 of share of B Ltd.
6. Obtain the rank coefficient of correlation from the following data.

<table>
<thead>
<tr>
<th>Prize of Tea (Rs.)</th>
<th>75</th>
<th>88</th>
<th>95</th>
<th>70</th>
<th>60</th>
<th>80</th>
<th>81</th>
<th>50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prize of Coffee (Rs.)</td>
<td>120</td>
<td>134</td>
<td>150</td>
<td>115</td>
<td>110</td>
<td>140</td>
<td>142</td>
<td>100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>슬로건 면목 (원)</th>
<th>75</th>
<th>88</th>
<th>95</th>
<th>70</th>
<th>60</th>
<th>80</th>
<th>81</th>
<th>50</th>
</tr>
</thead>
<tbody>
<tr>
<td>슬로건 면목 (원)</td>
<td>120</td>
<td>134</td>
<td>150</td>
<td>115</td>
<td>110</td>
<td>140</td>
<td>142</td>
<td>100</td>
</tr>
</tbody>
</table>

SECTION – C

Answer any three questions from the following. Each question carries fourteen marks. (3×14=42)

7. The following data relates to the number of passenger cars (in Millions) sold from 2000 to 2006.

<table>
<thead>
<tr>
<th>Year</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>6.7</td>
<td>5.3</td>
<td>4.3</td>
<td>6.1</td>
<td>5.6</td>
<td>7.9</td>
<td>5.8</td>
</tr>
</tbody>
</table>

a) Fit a straight line trend to the data and obtain the trend values.
b) Estimate the sale of cars for the year 2010.

<table>
<thead>
<tr>
<th>Year</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>6.7</td>
<td>5.3</td>
<td>4.3</td>
<td>6.1</td>
<td>5.6</td>
<td>7.9</td>
<td>5.8</td>
</tr>
</tbody>
</table>

a) Find the equation of the least squares line for the data.
b) 2010 year sales of cars estimated?

8. From the following data, find out the number of students who secured more than 40 but less than 45 marks.

<table>
<thead>
<tr>
<th>Marks</th>
<th>30-40</th>
<th>40-50</th>
<th>50-60</th>
<th>60-70</th>
<th>70-80</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of students</td>
<td>31</td>
<td>42</td>
<td>51</td>
<td>35</td>
<td>31</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Marks</th>
<th>30-40</th>
<th>40-50</th>
<th>50-60</th>
<th>60-70</th>
<th>70-80</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of students</td>
<td>31</td>
<td>42</td>
<td>51</td>
<td>35</td>
<td>31</td>
</tr>
</tbody>
</table>
9. From the following data on six cities, calculate the coefficient of correlation between density of population and death rate.

<table>
<thead>
<tr>
<th>City</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density of population</td>
<td>200</td>
<td>500</td>
<td>400</td>
<td>700</td>
<td>600</td>
<td>300</td>
</tr>
<tr>
<td>Population (000)</td>
<td>30</td>
<td>90</td>
<td>40</td>
<td>42</td>
<td>72</td>
<td>24</td>
</tr>
<tr>
<td>No. of deaths</td>
<td>300</td>
<td>1440</td>
<td>560</td>
<td>840</td>
<td>1224</td>
<td>312</td>
</tr>
</tbody>
</table>

10. Estimate the revenue generated for the year 2013 and 2015 from the following table.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenue (Rs. in Crores)</td>
<td>100</td>
<td>120</td>
<td>150</td>
<td>210</td>
<td>320</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2013 and 2015 are the years for which the revenue is to be estimated.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenue (Rs. in Crores)</td>
<td>100</td>
<td>120</td>
<td>150</td>
<td>210</td>
<td>320</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

11. Obtain the two regression equations from the following data and estimate the value of X when Y = 50 and the value of Y when X = 45.

<table>
<thead>
<tr>
<th>X</th>
<th>40</th>
<th>50</th>
<th>38</th>
<th>60</th>
<th>65</th>
<th>50</th>
<th>35</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y</td>
<td>38</td>
<td>60</td>
<td>55</td>
<td>70</td>
<td>60</td>
<td>48</td>
<td>30</td>
</tr>
</tbody>
</table>

Given the data, we can create a regression equation. For X = 50, we estimate Y and for Y = 45, we estimate X using the regression equation.

<table>
<thead>
<tr>
<th>X</th>
<th>40</th>
<th>50</th>
<th>38</th>
<th>60</th>
<th>65</th>
<th>50</th>
<th>35</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y</td>
<td>38</td>
<td>60</td>
<td>55</td>
<td>70</td>
<td>60</td>
<td>48</td>
<td>30</td>
</tr>
</tbody>
</table>
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COMMERCE
3.6 : Quantitative Analysis for Business Decisions – II

Time : 3 Hours
Max. Marks : 70

Instruction : Answer should be completely either in English or in Kannada.

SECTION – A

1. Answer any five sub questions. Each sub question carries two marks. (5x2 = 10)
   a) What is rank correlation?
   b) Define the term regression.
   c) What is a seasonal variation?
   d) Expand \((y - 1)^6 = 0\)
   e) What are the methods of sampling?
   f) What is an Event?
   g) If, \(r = 0.6\) and \(N = 64\) of a distribution, find the probable error.

SECTION – B

Answer any three questions. Each question carries six marks. (3x6 = 18)

2. Marks scored by 6 participants in a beauty contest assigned by two judges are given below
   Marks assigned by Judge – I: 30 36 47 48 32 28
   Marks assigned by Judge – II: 28 38 49 46 30 26
   Calculate rank correlation after assigning rank

3. The correlation co-efficient between the variables \(X\) and \(Y\) is \(r = 0.60\). If \(\sigma_x = 1.50, \sigma_y = 2, \overline{X} = 10, \overline{Y} = 20\). Calculate two regression equations.

4. Estimate the missing value of production.
   Year : 2010 2011 2012 2013 2014 2015
   Production : 320 300 ? 280 278 250

5. What are the different types of probability sampling techniques?

6. One card is drawn from a standard pack of 52. What is the probability that it is:
   a) A Spade         b) A King       c) The ace of club

P.T.O.
SECTION - C

Answer any three questions. Each question carries fourteen marks. (3×14=42)

7. From the following data of the marks obtained by 10 students in Accounts and Statistics. Calculate Pearson’s correlation.
   Roll No : 1   2   3   4   5   6   7   8   9   10
   Marks in Accounts : 20  25  60  45  80  28  55  65  30  75
   Marks in Statistics : 25  50  55  56  60  70  72  78  80  63

8. The heights (in cms) of a group of father’s and son’s are given below:
   Height of father’s : 158 166 163 165 167 170 167 152 177 181
   Height of son’s : 163 158 167 170 160 180 170 175 172 175
   Find the lines of regression and estimate the height of son when the height of father is 164cm.

9. Fit a straight line trend to the following by the method of least squares. Assuming that the same rate of changes continues, state what would be the estimated earning for the year 2016. Also show actual and trend lines on a graph.
   Year : 2005 2006 2007 2008 2009 2010 2011 2012
   Earnings : 38 40 65 72 69 60 87 95 (in lakhs)

10. You are required to find out the number of workers falling within Rs. 250 and Rs. 350.
   Earnings for daily
   Number of workers
   Up to 100 : 50
   Up to 200 : 150
   Up to 300 : 300
   Up to 400 : 500
   Up to 500 : 700

11. Estimate the production for the year 2004 and 2006 with the help of the following table using Binomial Expansion method.
   Year : 2001 2002 2003 2004 2005 2006 2007
   Production : 200 220 260 ? 350 ? 430
   (In ‘000’ tones)