

2071

B.A./B.Sc. (General) Fourth Semester

Economics

Paper: Quantitative Methods

Time allowed: 3 Hours

Max. Marks: 90

**NOTE:** Attempt five questions in all, including Question No. I which is compulsory and selecting one question from each Unit.

x-x-x

Q. No.	Question	Marks																						
I.	<p>Attempt any nine of the following:</p> <p>(i) Commutative Property of Set.</p> <p>(ii) If <math>f(x) = 4 - 2x + x^2</math>. Find <math>f(5)</math></p> <p>(iii) Find <math>\frac{dy}{dx}</math>, if <math>Y = \frac{x^2 - x + 1}{x^2 + x + 1}</math></p> <p>(iv) Two Properties of determinant.</p> <p>(v) Find the value of <math>A^2 - B^2</math></p> <div style="text-align: center;"><math>A \begin{bmatrix} 5 &amp; 4 \\ 3 &amp; 2 \end{bmatrix} \quad B \begin{bmatrix} 3 &amp; 2 \\ 7 &amp; 6 \end{bmatrix}</math></div> <p>(vi) Merits of Median</p> <p>(vii) Calculate co-efficient of Skewness 4,7,8,10,13</p> <p>(viii) If regression coefficient <math>b_{yx} = 1.40</math> and <math>b_{xy} = 0.65</math>, calculate the coefficient of correlation.</p> <p>(ix) Distinguish between Correlation and Regression.</p> <p>(x) Uses of Index Number.</p> <p>(xi) Why Fisher Price Index is called the ideal index number.</p> <p>(xii) Importance of Interpolation.</p> <p>(xiii) Secular trend as a component of time series.</p>	9x2=18																						
UNIT-I																								
II.	<p>Differentiate the following with respect to x:</p> <p>a) <math>Y = a^x + e^x + x^x + e^e</math></p> <p>b) <math>Y = \log (x+2 + \sqrt{x^2 + 4x + 1})</math></p> <p>c) <math>Y = e^{2x-1}</math></p>	7,7,4																						
III.	<p>a) Find the extreme values of the following: <math>Y = X^3 - 6X^2 + 9X - 8</math></p> <p>b) If the demand function is <math>p = \sqrt{9 - x}</math>. Find at the level of output x, the total revenue will be maximum. Also, find TR.</p>	9,9																						
UNIT-II																								
IV.	<p>If <math>A = \begin{bmatrix} 4 &amp; 7 &amp; 6 \\ 7 &amp; -1 &amp; 8 \\ 3 &amp; 4 &amp; 2 \end{bmatrix}</math>, prove that <math>AA^{-1} = I</math></p>	18																						
V.	<p>Following are the scores of two batsman Dhoni and Kohli in a series of innings:</p> <table border="1"><tr><td>Dhoni</td><td>12</td><td>115</td><td>6</td><td>73</td><td>7</td><td>19</td><td>119</td><td>36</td><td>84</td><td>29</td></tr><tr><td>Kohli</td><td>47</td><td>12</td><td>76</td><td>42</td><td>4</td><td>51</td><td>37</td><td>48</td><td>13</td><td>0</td></tr></table> <p>Find out who better scorer is and who is more consistent.</p>	Dhoni	12	115	6	73	7	19	119	36	84	29	Kohli	47	12	76	42	4	51	37	48	13	0	18
Dhoni	12	115	6	73	7	19	119	36	84	29														
Kohli	47	12	76	42	4	51	37	48	13	0														

P.T.O.

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UNIT-III

VI.

a) Estimate the production for the year 1965 and 1975 with the help of following data.

Year	1950	1955	1960	1965	1970	1975	1980
Production	20	22	26	?	35	?	43

b) Calculate coefficient of rank correlation, given the following data:

Judge I	1	2	3	4	5	6	7	8	9	10
Judge II	4	7	1	9	8	2	10	6	3	5

9,9

VII.

Fit two regression equations on the following:

X	10	12	13	17	18	20	24	30
Y	5	6	7	9	13	15	20	21

Estimate X when Y = 26

Estimate Y when X = 18

18

UNIT-IV

VIII.

Fit a straight line trend to the following:

Years	1980	1981	1982	1983	1984	1985	1986
Sales	125	128	133	135	140	141	143

Also calculate the sales for the year 1989

18

IX.

Calculate Fisher index number from the following data and show that it satisfies Time reversal and Factor reversal test.

Commodity	1995		1990	
	Price	Value	Price	Value
A	5	45	6	48
B	7	21	8	40
C	9	54	10	50
D	6	36	7	42

18

x-x-x