



RAN-2508000603033001

B.Com. Data Analytics (Sem. III) Examination November - 2025

MDC - Econometrics for Data Analytics

[Total Marks: 50]

સૂચના : / Instructions

(1) ઉપરોક્ત દર્શાવેલ વિગતો ઉત્તરવહી પર અવશ્ય લખવી.

Fill up strictly the above details on your answer book

Seat No.:

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Student's Signature

Q-1.

Answer the following questions: (Any Five)

10

- If $r_{12} = 0.8$, $r_{13} = 0.7$, $r_{23} = 0.6$ then find the values of $r_{12,3}$.
- If a linear trend equation is $y = 65 + 3.65x$ then what Will be the value of y when $x = -5$?
- The price of a commodity Reduce by 8% its demand is also increased by 10% then find elasticity of demand.
- The total revenue functions of a commodity is $x = 75 - \frac{P}{2}$, then find at which price the demand would be 25 units ?
- Find the period of moving average for the following time series data.

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Revenues Rs.	24	23	22	20	24	25	29	31	26	25	24

- In a certain trivariate distribution: $S_1 = 3$, $S_2 = 4$, $S_3 = 5$, $r_{12} = 0.70$, $r_{31} = 0.6$, $r_{23} = 0.4$ then find the values of $b_{12,3}$.
- Given that $r_{12} = 0.69$, $r_{13} = 0.45$, $r_{23} = 0.58$ calculate the $R_{3,12}$.

Q.2. (A)

Fit a straight line $y = a + bx$ the following time series. Hence find the trends and short-term variations.

09

Year	1985	1986	1987	1988	1989	1990	1991
sales	127	101	130	132	126	142	137

Q.2. (B)

Find three yearly moving averages and short-term variations.

05

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993
sales	110	115	120	111	120	130	131	135	137

OR

Q.2. (A)

Obtain the seasonal variations and irregular variations for the following time series data: (use moving average method)

08

Year	Summer	Monsoon	Autumn	Winter
1970	50	52	53	57
1971	52	55	56	60
1972	56	57	60	62
1973	58	59	63	67
1974	65	66	67	72

- (B) Obtain trend and short-term variations using the method of three yearly moving average and draw the graphs of the original data and trend on the same graph paper. **06**

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993
sales	180	185	192	190	196	200	195	202	210

- Q.3** (A) Obtain η When the price of a commodity rises from 22 to 30 per kg., The demand is reduced from 10,000 kg to 8000 kg. **04**
- (B) Demand function of a commodity is $x = 30 - \sqrt{P}$ then find elasticity of demand when price is 100. **04**
- (C) Given $r_{12} = 0.8$, $r_{23} = 0.6$, $r_{31} = 0.5$, $S_1 = 10$, $S_2 = 8$, $S_3 = 5$ find the regression equation of x_2 on x_1 and x_3 . **06**

OR

- Q.3** (A) Demand function of a commodity is $P = 40 - x$ and total cost function $C = 10 + 5x + 0.25x^2$ then find how many units are produced to maximise profit. **04**
- (B) Supply function of a commodity is $x = 6P - 40$, find elasticity of supply when price is 12. **04**
- (C) In a trivariate distribution. **06**

$\bar{X}_1 = 55.95$	$S_1 = 2.26$	$r_{12} = 0.578$
$\bar{X}_2 = 51.48$	$S_2 = 4.39$	$r_{13} = 0.581$
$\bar{X}_3 = 56.03$	$S_3 = 4.41$	$r_{23} = 0.974$

Find the least square regression equation of x_3 on x_1 and x_2 .

- Q.4. Write short notes: (Any three)** **12**
1. Which point should be noted about the multiple correlation coefficients.
 2. Derive the normal equation to fit of a straight line $y = a + bx$.
 3. Explain the Cob-douglas production function.
 4. Explain the moving average method.
 5. Explain the demand function.