OEST112

Reg. No. | | | | | | | | |

I Semester All UG Courses Degree Examination, February/March - 2024

STATISTICS

Business Statistics (OE)

(NEP Scheme F+R)

Time : 2½ Hours **Maximum Marks : 60**

Instructions to Candidates:

1. Answer any **Eight** questions from section-A and any **Three** from Section-B.
2. Scientific **calculators** are allowed.

SECTION - A

I. Answer any **EIGHT** questions from the following. **(8×3=24)**

1. Define :
   (i) Arithmetic mean
   (ii) Geometric mean
   (iii) Harmonic mean.
2. In a bivariate data, covariance is 20, variance are 25 and 36 respectively. Find r, also interpret the result.
3. Mention the properties of regression coefficients.
4. If $b_{xy} = 0.6$, r = 0.75, S.D(X) = 3. Find S.D(Y).
5. What are price index and value index numbers?
6. What is time reversal test and factor reversal test? Mention the index number that satisfies both of the tests.
7. Explain business cycle.
8. What are cost of living index number. Mention its uses.
9. Write the normal equations for fitting linear trend.
10. What is seasonal variation? Explain.

SECTION - B

II. Answer any **THREE** questions from the following. **(3×12=36)**

11. a) The mean age of 100 workers in a factory is 38. The mean age of 60 workers in morning shift is 40. Find the mean age of workers working in the evening shift.

    b) Calculate $Q_1, Q_2, Q_3, D_4, P_{60}$ for the following data

Value	9	10	11	12	13	14	15	16
Frequency	3	6	10	24	42	30	15	7

(6+6)

12. Calculate moments and also find β_1 and β_2. Comment on the Skewness and Kurtosis.

Size	1	2	3	4
Frequency	5	18	20	6

(12)

13. a) Following are the marks of 8 students in statistics and mathematics. Find co-efficient of rank correlation.

Marks in statistics	25	43	27	35	54	61	37	45
Marks in mathematics	35	47	20	37	63	54	28	40

b) Following are the data pertaining to the production and export of sugar in lakh tonnes in India from 1971 to 1982

Production (X)	37.4	31.1	38.7	39.5	47.9	42.6	48.4	64.6	58.4	38.6	51.4	84.0
Export (Y)	3.90	1.33	1.10	4.39	9.41	9.67	3.41	2.51	8.62	9.90	6.64	6.50

i. Find the regression of Y on X.

ii. Test the significance of the regression coefficient.

iii. Test whether the regression line in the population passes through the origin.

iv. What export of sugar can be expected when the production is 50 lakh tonnes?

(4+8)

14. a) Explain the steps involved in the construction of index number.

b) From the following data, compute Fisher's price and quantity index number for 2000 and 1990 as the base year : **(4+8)**

Commodity	1990		2000	
	Quantity	Value	Quantity	Value
A	50	350	60	420
B	120	600	140	700
C	30	330	20	200
D	20	360	15	300
E	5	40	5	50

15. a) Calculate trend values by 5 yearly moving averages and plot trend value on the graph. **(6+6)**

Year :	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Sales :	18	18	21	20	16	17	17	16	21	20	20

b) Fit the curve of the type $y = ab^x$ and estimate the population for 2021.

Year :	1971	1981	1991	2001	2011
Population :	10	13	17	23	30