U.G. 5th Semester Examination-2021

ECONOMICS

[PROGRAMME]

Skill Enhancement Course (SEC)

Course Code : ECOP-SEC-T-03

(Statistical Tools for Data Analysis-II)

Full Marks : 40 Time : 2 Hours

The figures in the right-hand margin indicate marks.

Candidates are required to give their answers in their own words as far as practicable.

1. Answer any **five** questions: 2×5=10

   a) Draw a suitable scatter diagram to represent negative and linear correlation between two variables x and y.

   b) Write the Pearson's product moment correlation coefficient and interpret it.

   c) Mention any two properties of correlation coefficient.

   d) What kind of correlation do you expect between price of petrol and taxi fare? What will be the value of correlation coefficient in that case?

   e) Find the value of correlation coefficient (r) when the two regression coefficients $b_{x,y}$ and $b_{y,x}$ are 0.25 and 4.0 respectively.

   f) When the regression lines will be perpendicular to each other?

   g) What is meant by price relatives?

   h) Under what condition the concept of rank correlation is used?

   i) Why care should be taken regarding choice of base year while constructing price index?

2. Answer any **two** questions: 5×2=10

   a) Explain the relationship between bivariate frequency distribution, marginal distribution and conditional distribution. What is conditional mean value?

   b) "Scatter diagram exhibits the degree and types of association between the two variables." Discuss.

   c) Discuss the properties of regression coefficient.

   d) Discuss the importance and uses of price index numbers in economics in brief.

3. Answer any **two** questions: 10×2=20

   a) Distinguish between price index number and quantity index number. From the following data calculate quantity index numbers for the years Y and Z with X as the base year, using (i) simple arithmetic mean, and (ii) weighted arithmetic mean, of the relatives : $3+\left(3\frac{1}{2}+3\frac{1}{2}\right)=10$

Commodity	Production in year			
	X	Y	Z	Weights
A	120	168	156	17
B	24	42	45	30
C	50	72	68	13
D	160	200	216	20

b) Deduce the Spearman's formula for rank correlation coefficient. How this formula is modified in the presence of tied ranks?

7+3=10

c) Distinguish between Paasche's price index and Laspeyeres' price index. How Fischer's Ideal index is derived from the above two indices? From the following data calculate Fischer's Ideal index:

ΣP_0Q_0=240, ΣP_nQ_0=300, ΣP_0Q_n=120 and $\Sigma P_nQ_n = 180$ where P_0, Q_0, P_n, and Q_n stands for base year price, base year quantity, current year price and current year quantity respectively.

3+3+4=10

d) If $X_i = a + bM_i$, and $Y_t = c + dN_i$, (i=1,2,3,….,n), where *a, b, c d* are arbitrary constants, prove that (i) $r_{XY} = r_{MN}$ if *b*, and *d* are of the same sign and (ii) $r_{XY} = -r_{MN}$ if *b*, and *d* are of the opposite signs. [r_{XY} and r_{MN} stands for correlation coefficient between X, and Y, and correlation coefficient between M, and N respectively.] 10

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