BACHELOR OF SCIENCE (CBCS-2018 COURSE)
F. Y. B. Sc. Sem-II : WINTER- 2022
SUBJECT : STATISTICS : DESCRIPTIVE STATISTICS-II

Day : Monday   Time : 02:00 PM-05:00 PM

Date : 19-12-2022   **W-18337-2022**   Max. Marks : 60

N.B.
1) All questions are **COMPULSORY.**
2) Figures to the right indicate **FULL** marks.
3) Use of non-programmable calculator is allowed.

Q.1   Attempt any **TWO** of the following: **(12)**

a) Define Coefficient of Correlation and State its important Properties.

b) Define Regression and give the interpretation of regression coefficients.

c) Compute Price Index for 2002 with 2000 as base year using
i)Simple Aggregate Method.
ii)Simple Average of price relatives using arithmetic mean.
iii) Using geometric mean of price relatives.

Commodities	A	B	C	D	E
Price in 2000	40	60	20	50	80
Price in 2002	50	60	30	64	104

Q.2   Attempt any **TWO** of the following: **(12)**

a) Prove that
i) $Cov(x, x) = Var(x)$
ii) $Cov(x-a, y-b) = Cov(x,y)$ where a, b are constants.

b) Spearman's rank correlation coefficient between X and Y is 0.5. If the Sum of the squares of the difference between rank is 42. Find the number of pairs. Assume that no rank is repeated.

c) Profit (in lakhs of Rs.) earned by company in X^{th} year is tabulated below

Year (X)	1	2	3	4	5
Profit (Y)	24	27	32	38	45

Fit a second degree curve $Y = a + bx + cx^2$. Also estimate profit in 7th year.

Q.3   Attempt any **TWO** of the following: **(12)**

a) Write a short note on.
i)   Laspeyer' Index Number.
ii) Paasche's Index Number.
iii) Fisher's Index Number.

P.T.O.

b) Following data are related to marks in Accountancy(x) and marks in statistics (Y) of 10 candidates.

x	66	65	68	68	67	66	70
y	68	67	67	70	65	68	70

  i) Calculate Regression Coefficient, hence correlation coefficient .
  ii) Estimates marks in statistics of a student who has scored 76 marks in Accountancy.

c) Explain the procedure of fitting of a curve $Y=ab^x$.

Q.4 Attempt any **THREE** of the following: **(12)**

a) Discuss any four different problems in a construction of Index Number.

b) Compute Coefficient of Correlation between supply and price of a commodity using following data.

Supply	152	158	169	182	160	166	182
Price	198	178	167	152	180	170	162

c) Show that Fisher's Index number lies between Laspeyer's Index number and Paasche's Index number using the following data.

Commodity	Year 2000		Year 2002	
	Price	Quantity	Price	Quantity
A	5	4	13	5
B	9	5	17	4
C	13	2	19	3

d) Prove that Coefficient Of Correlation lies between -1 to 1 i.e. $-1 \leq r \leq 1$.

Q.5 Attempt any **FOUR** of the following: **(12)**

a) State the applications of regression.

b) Why Index Number is called as an Economic Barometer?

c) If $\sigma_x = 4, \sigma_y = 5$. and r =0.8 then find b_{yx}.

d) Write down the Limitations of Index Number.

e) Write a note on
  i) Scatter Diagram.
  ii) Karl Pearson's Coefficient of Correlation.

f) Define Coefficient of Determination (r^2)

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