

**F.Y.B.SC. SEM – II (CBCS - 2016 Course) : WINTER - 2018**  
**SUBJECT : STATISTICS : DESCRIPTIVE STATISTICS – II**

Day : Wednesday  
Date : 17/10/2018

**W-2018-0700**

Time : 03.00 P.M. To 06.00 P.M  
Max. Marks : 60

**N.B:**

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Use of statistical tables and **CALCULATOR** is allowed.
- 4) Draw neat and labeled diagrams **WHEREVER** necessary.

**Q.1 A) Choose correct alternative for: (06)**

- 1) If  $Cov(X, Y) = 20$ , then  $Cov(Y, X)$  is \_\_\_\_\_.  
a) -20                      b) 20                      c) 40                      d) None of the above
- 2) If  $\sigma_x^2 = \sigma_y^2 = 4$ ,  $Cov(X, Y) = 2$ , then  $Corr(X, Y)$  is \_\_\_\_\_.  
a) 0.5                      b) -0.66                      c) -0.5                      d) 0.60
- 3) If  $b_{yx} = b_{xy}$  then \_\_\_\_\_.  
a)  $r = 1$                       b)  $r = -1$                       c)  $r = 0$                       d)  $\sigma_x = \sigma_y$
- 4) If Laspeyre's index number is 140 and Paasche's index number is 130 then Fisher's index number is \_\_\_\_\_.  
a)  $\sqrt{140 \times 130}$                       b) 140                      c) 130                      d) 132
- 5) If the regression line of  $Y$  on  $X$  is  $2Y = 3X - 6$ , then  $b_{yx}$  is \_\_\_\_\_.  
a) 2                      b) 3                      c) 1.5                      d) -3
- 6) If  ${}^L P_{01} = {}^P P_{01}$  then \_\_\_\_\_.  
a)  ${}^L P_{01} > {}^P P_{01}$                       b)  ${}^L P_{01} = {}^P P_{01} = {}^F P_{01}$   
c)  ${}^P P_{01} > {}^F P_{01}$                       d) None of the above

**B) State whether the following statement is True or False: (06)**

- 1) Price relative is the difference between current year price and base year price.
- 2) The algebraic signs of  $b_{yx}$ ,  $b_{xy}$  and  $r$  are the same.
- 3) Spearman's rank correlation coefficient is always positive.
- 4) The index number of base year is 100.
- 5) It is possible to have  $b_{yx} = 2$  and  $b_{xy} = 1.5$ .
- 6)  $Cov(X, Y) = Cov(3X, 2Y)$

P.T.O.

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

- Write note on scatter diagram.
- Find  $n$  if  $r = 0.5$ ,  $\sigma_y = 8$ ,  $\sum(X - \bar{X})^2 = 90$  and  $\sum(X - \bar{X})(Y - \bar{Y}) = 120$ .
- For the two regression lines  $9Y = X + 16$  and  $4X - Y = 6$ . Find the correlation coefficient and estimate  $X$  when  $Y = 4$ .
- The rank obtained by 10 students in Physics and Chemistry are:

Physics	1	2	3	5	5	5	7	8	9	10
Chemistry	2	4	2	5	2	9	7	10	6	8

Find rank correlation coefficient.

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

- Define regression coefficients.
- State any three properties of correlation coefficient.
- Specify the inconsistency if any in the following:  
 $b_{xy} = 1.6$ ,  $b_{yx} = -0.5$
- Compute price index for 2002 with 2000 as base year using simple aggregate method:

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

- Given  $\sigma_x = 1$ ,  $\sigma_y = 2$ ,  $r = 0.7$ , find  $Cov(X, Y)$ . Also find  $Cov(3X, -2Y)$

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

- Describe the procedure of fitting of second degree curve.
- Define correlation coefficient between two variables X and Y. Also show that correlation coefficient lies between  $-1$  and  $1$ .
- Obtain the regression line of X on Y for the following bivariate data:

X	2	3	6	4	5
Y	4	3	5	2	1

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

- Compute Laspeyre's, Paasche's, Fisher's price index number for the following data:

Commodity	Base Year		Current Year	
	Price	Quantity	Price	Quantity
A	4	6	5	4
B	5	4	6	2
C	6	2	8	1

- Define Spearman's rank correlation coefficient and derive its expression.
- Suppose X, Y and Z are uncorrelated variables having same means and variances. Find:
  - $Corr(X + Y, Y - Z)$
  - $Corr(X + Y, Y + Z)$

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