Day	: **Wednesday**		Time : **03.00 PM TO 05.00 PM**
Date	: **01/11/2017**		Max. Marks : 40

W-2017-0605

N.B.:

1) All questions are **COMPULSORY**.
2) Figures to the right indicate **FULL** marks.
3) Use of statistical tables and **CALCULATOR** is allowed.

Q.1 Attempt **ANY TWO** of the following:

a) Show that correlation coefficient lies between -1 and 1.

b) Obtain Spearman's rank correlation coefficient for the following data:

X	26	23	19	27	20
Y	19	27	24	29	30

c) Derive the formula $R = 1 - \dfrac{6\Sigma d^2}{n^3 - n}$.

Q.2 Attempt **ANY TWO** of the following:

a) Obtain the regression line of Y on X for the following data:

X	12	9	13	10	16
Y	15	19	22	12	18

b) Two regression lines are given by $2X + 3Y - 6 = 0$ and $5X + 7Y - 12 = 0$. Calculate mean values of X and Y and correlation coefficient between X and Y.

c) Explain the concept of "explained variation" and "unexplained variation" of dependent variable.

Q.3 Attempt **ANY TWO** of the following:

a) Compute Lasperyre's and Paasche's price index number for the following data:

Commodity	Base year Price	Base year Quantity	Current year Price	Current year Quantity
P	9	5	15	5
Q	1	4	2	8
R	4	6	5	6

b) If X and Y are uncorrelated and $\sigma_x^2 = 3$, $\sigma_y^2 = k$.

Find k such that Var $(2X - Y) = 29$, also find Var $(X + 2Y)$.

c) Describe the procedure of fitting of exponential curve.

Q.4 Attempt **ANY FIVE** of the following:

a) State any two problems in construction of index number.
b) Explain the term scatter diagram.
c) If $b_{yx} = -2.3$, $b_{xy} = -0.3$, find correlation coefficient between X and Y.
d) Given : $\sigma_x = 2$, $\sigma_y = 3$, $r = -0.8$. Find Cov(X, Y).
e) State two properties of regression coefficients.
f) If cov$(X,Y) = 16$, find cov$(2X, 3Y)$.
g) Explain the term base year.

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