4. Answer any one questions of the following: **10 X 1**

a) i) Prove that Fisher's Price Index satisfies the Time Reversal Test and also the Factor Reversal Test.

ii) The percentage increase in price of different group of items for middle class people and percentage of total expenditure in different items are given to you. Calculate the CLI of the group.

Group	% increase in price	% Increase in expenditure
Food	125	40
Cloth	66	20
Fuel	112	10
Rent	90	18
Others	105	12

6+4

b) i) Obtain the Seasonal Indices by the method of Moving Average(using additive model) from the following data.

Quarter	Quarterly output(lakh, tons)			
	2011	2012	2013	2014
I	31	42	49	47
II	39	44	53	51
III	45	57	65	62
IV	36	45	55	50

ii) During a certain period, the CLI goes up from 110 to 200 and the salary of a worker is also raised from Rs.325 to Rs.500. Does the worker really gain, if so, by how much in real times ?   7+3

(*Internal Assessment :10 marks*)

Total Pages - 04 (Four)   16/PG/PKC/IS/COM-102

2016

M. Com.

1st Semester Examination

BUSINESS STATISTICS

PAPER – COM – 102

Full Marks : 50

Time : 2 Hours

The figures in the right-hand margin indicate full marks.

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

UNIT – I

1. Answer any two questions of the following: **5 X 2**

(a) Prove that if two events are independent then their complementary events are also independent.

(b) The chances that Dr. S. Roy will diagnose disease X correctly is 60%. The changes that a patient will die by his treatment after correct diagnosis is 70%. A patient of Dr. Roy who had disease X, died. What is the chance that his disease was diagnosed correctly?

(c) Distinguish between co-relation and regression. Prove that the Pearson's product moment co-relation co-efficient lies between -1 and +1.

(d) Write a brief note on Subjective Probability.

(Turn Over)

2. Answer any one questions of the following: **10 X 1**

a) i) What are the limitations of classical probability?

ii) A shot is fired from three guns. E_1, E_2 and E_3 denote the events that the target is hit by the first, second and third gun respectively. If $P(E_1)=0.5$, $P(E_2)=0.6$, $P(E_3)=0.8$ and E_1, E_2 and E_3 are independent. Find the probability that exactly one hit is registered and at least two hits are registered.   3+7

b) i) In case of a linear regression model, show that –TSS=ESS+RSS, where TSS=Total sum of squares, ESS=Explained sum of squares, RSS=Residual sum of squares.

ii) For the variables X and Y, the two lines of regressions were obtain as

$3x+2y-25=0$ and $6x+y-30=0$.

You are asked to calculate :

I)   Identify the two regression lines.

II) Find the means of X and Y, and the value of co-relation co-efficient between X and Y.   5+3+2

UNIT – II

3. Answer any two questions of the following: **5 X 2**

a) (i) You are given that $Y=480+10t+0.80t^2$
(Origin 2015, t=1 year, Y=Annual production of sugar in tones)
Shift the origin to year 2010.

(ii) You are given that $Y=240+3.80t$
(Origin 2012, t=1 year, Y=Annual production of rice in tones) Shift the origin to year 2014-15.   3+2

b) Using Newton's Interpolation formulae, find the number of factories earning less than Rs.65,000=oo as profit from the following data.

Profit	30-40	40-50	50-60	60-70	70-80
No. of factories	34	43	56	39	29

c) What do you mean by Time series? Mention its chief components.
                   2+3

d) What is attributes? Why it is needed in statistics?   3+2

(Turn Over)