

**2018**

**M. Com.**

**1<sup>st</sup> 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: 2 X 2**

- (a) What do you understand by  $r^2$  ?
- (b) What is the probability of no diamond if four cards drawn from a pack of 52 cards?
- (c) Mention two limitation of classical definition of probability.
- (d) Give a note on scatter diagram.

**2. Answer any two questions: 2 X 4**

- (a) Four boxes contain 12 eggs each. The number of spoiled eggs in the boxes are 0, 1, 3 and 4 respectively. If one box is selected at random then one egg is drawn from that selected box, find the probability that the selected egg is a spoiled egg.
- (b) What is rank correlation? State the uses of it.
- (c) Proof that classical probability is a limiting case of Axiomatic Probability?
- (d) Proof that if two events are independent then their complementary events are also independent.

***(Turn Over)***

(2)

**3. Answer any one question: 1 X 8**

- a) State and prove the formula of Karl Pearson's Product Moment of correlation co-efficient.
- b) i) 10 students were participated in a drama competition and they were ranked by two judges. The rank correlation coefficient between two series of ranks has been found as 0.6. However, on the subsequent verification it has been found that one of the students who actually ranked as (5, 8) by two judges was wrongly recorded as (8, 4). Find the correct value of rank correlation coefficient.

ii) The following table shows the study time and exam scores for 10 students.

Study Hr.(X)	1	5	7	8	10	11	14	15	15	19
Score (Y)	53	74	59	43	56	84	96	69	84	83

Fit a regression equation of Y on X and estimate the score of a student if his study Hr is 6 hours. 3 + 5

**UNIT – II**

**4. Answer any two questions : 2 X 2**

- a) Identify the components name in time series of the following items and justify your answer –
  - i. Decrease in production and employment due to economic recess.
  - ii. Increase in export of food grains from India to Afghanistan due to war.
- b) You are given  $Y=50 (1.6)^t$ , where origin : year 2015, t= 1 year and Y is the annual sales.

Shift the origin forward by two years in the above equation.

- c)  $U_x$  is a polynomial in x, from the given data find  $U_x$

n	:	0	1	2	5
$U_x$	:	2	3	12	147

(3)

- d) Discuss the Yule's Coefficient of Association.

**5. Answer any two questions: 4 X 2**

- a) Find  $f_{(5)}$  from the following data –  
 $f_{(3)}=4, f_{(4)}=13, f_{(6)}=43$ .
- b) Prove that Fisher's Ideal Index no satisfy both time reversal and factor reversal test.
- c) You are given

$Y=48 + 1.2t + 0.8t^2$  where origin = year 2012, t unit = 1 year, Y= annual sales

Shift the origin of the above equation to year 2015.

- d) Show that Pasche's Price Index is the weighted harmonic mean of price relative, where weight is the current years value.

**6. Answer any one question: 8 X 1**

- a) From the following production data, deseasonalise by the method of moving average with assume that additive model used here.

Quarter	Output (000 tons)			
	2014	2015	2016	2017
I	30	49	35	75
II	49	50	62	79
III	50	61	60	65
IV	35	20	25	70

- b) Find the association between literacy and unemployment from the following figures-

Total Adults	10000
Literates	1290
Unemployed	1390
Literate unemployed	820

Comment on the results.

**(Internal Assessment :10 marks)**

*Continued*