

**PARUL UNIVERSITY**  
**FACULTY OF COMMERCE**  
**B.Com.(Hons) Winter 2018 – 19 Examination**

Semester: 3

Date: 30/10/2018

Subject Code: 16100204

Time: 10.30 am to 1.00 pm

Subject Name: Business Statistics-II

Total Marks: 60

**Instructions:**

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

**Q.1 Do as directed.****A)****(06)**

1. The range of coefficient of correlation is
  - a) 0 to 1
  - b) -1 to 1
  - c) 1 to  $\infty$
  - d) none of the above
2. If regression coefficients are 0.8 and 0.2 then coefficient of correlation is ,
  - a) 0.2
  - b) 2
  - c) 0.4
  - d) 0.16
3. The sale of raincoats in monsoon reach its peak is a kind of,
  - a) cyclical variation
  - b) short term variation
  - c) seasonal variation
  - d) Irregular variation
4.  $\mu$  stands for the population parameter called ,
  - a) Standard deviation
  - b) Mean
  - c) Variance
  - d) Proportion
5. Degree of freedom for t-test for testing mean of a small sample is ,
  - a)  $n - 1$
  - b)  $(r - 1)(c-1)$
  - c)  $n - k - 1$
  - d)  $h - 1$
6. If standard deviation of population is 3 and sample size is 9 then , the standard error is
  - a) 1
  - b) 2
  - c) 3
  - d) 1/3

**B)****(06)**

1. Define null hypothesis
2. State one difference between large and small samples.
3. If sum of 4 observations is 7 then what is the mean?
4. It is believed that a candy machine makes chocolate bars that are on an average 5gm. A worker claims that the machine after maintenance no longer makes 5gm bars .State null and alternative hypothesis.
5. Write an equation for linear trend.
6. If calculated  $\chi^2$  is greater than tabular value of  $\chi^2$  at some significant level , then  $H_0$  may be rejected. True/False?

**Q.2****(12)**

1. Calculate the Laspeyre's , Paasche's index numbers from the following data:

Commodity	Base Year		Current Year	
	Price	Quantity	Price	Quantity
A	6	50	10	56
B	2	100	2	120
C	4	60	6	60
D	10	30	12	24
E	8	40	12	36

2. The sale and expenditure of 10 companies are given below. Find the coefficient of correlation between sale and expenditure.

Sale	50	55	55	60	65	65	65	60	60	50
Expenditure	11	13	14	16	16	15	15	14	13	13

3. Fit a linear trend that  $y = a + bx$  to the following data and hence find out trend:

Year	1971	1972	1973	1974	1975	1976	1977
Production	85	95	97	88	99	104	97

**Q.3 Answer the following. (Any Three)**

(18)

1. In a sample of 500 families in a city A, 30 families used a specific brand of detergent powder. In city B, 55 families used the same brand in a sample of 1000 families.. Do the data prove that the proportion of use of this detergent is equal in the two cities? (Check at 5% level of significance,  $Z_{table}=1.96$ )

2. Below are given the gain in weights (in lbs) of cows fed on two diets X and Y.

Diet X	25	32	30	32	24	14	32			
Diet Y	24	34	22	30	42	31	40	30	32	35

Test at 5% level whether the two diets differ as regards their effects on mean increase in weight. ( $t_{table}=2.131$ )

3. The units produced by a plant are classified into four grades. The past performance of the plant shows that the respective proportions are 8:4:2:1. To check the run of the plant 600 parts were examined and classified as follows. Is there any evidence of a change in production standards. ( $\chi^2_{table}=7.815$ )

Grade	First	Second	Third	Fourth	Total
Units	340	130	100	30	600

4. In a certain sample of 2000 families, 1400 families are consumers of tea. Out of 1800 Hindu families 1236 families consume tea. Use  $\chi^2$  test to test the independence of consumption of tea and religion. ( $\chi^2_{table}=3.84$ )

**Q.4 Answer the following. (Any two)**

(18)

1. Twenty four applicants for a position are interviewed by three administrators. Each applicant is given a suitable score and they are divided in two groups as follows.

Score of A	7	11	9	4	8	6	12	11	9	10	11	11
Score of B	8	9	13	14	11	10	12	14	13	9	10	8

Use the Mann Whitney U-Test to determine whether there was a difference in the scores of the two groups. Use 5% level of significance.

2. In a trivariate distribution  $\bar{x}_1=28.02$ ,  $\bar{x}_2=4.91$ ,  $\bar{x}_3=594$ ,  $S_1 = 4.4$ ,  $S_2 = 1.1$ ,  $S_3 = 80$ ,  $r_{12} = 0.8$ ,  $r_{13} = -0.4$ ,  $r_{23} = -0.56$ . Estimate  $x_1$ , when  $x_2 = 6$  and  $x_3 = 650$ .

3. Five coins are tossed for 320 times and the following distribution of number of heads is obtained.

Number of Heads	0	1	2	3	4	5
Frequency	8	42	116	90	52	12

Test the hypothesis that the coins are unbiased. ( $\chi^2_{table}=11.07$ )