

PARUL UNIVERSITY
FACULTY OF LAW
B.Com. LL.B. Winter 2018 – 19 Examination

Semester:5

Date: 26/10/2018

Subject Code: 17302301

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.**(15)**

- 1.If regression coefficients are 4 and 16 then correlation coefficient is ,
 (a) 0.8 (b) 8
 (c) 64 (d) 16
- 2.If standard deviation of x and y are 16.8 and 10.8 respectively and correlation coefficient is 0.42 then , b_{yx} is,
 (a) 0.653 (b) 0.789
 (c) 0.684 (d) 0.333
- 3 When $L=124.06$, and $P=125$ then Fisher's index number F is,
 (a) 3.333 (b) 124.53
 (c) 208.33 (d) 137.87
- 4.The index number of the base year is,
 (a) 1 (b) 0
 (c) 100 (d) none of the above
5. Degree of freedom for contingency table is ,
 a) $n - 1$ b) $(r - 1)(c - 1)$
 c) $n - k - 1$ d) $h - 1$
6. Define Trend Analysis
7. Define Correlation with one example.
8. σ stands for the population parameter called _____
9. It is believed by doctors that teen agers sleep more than 18 hours per day. But an experiment was done by taking sample of 100 teen agers and it was found that they do not sleep for more than 18 hours. Write null and alternative hypothesis.
10. State one difference between Large and small samples.
11. If standard deviation of population is 2.87 and sample size is 31 then , the standard error is _____
12. Write types of correlation.
13. Write formula for Spearman's rank correlation coefficient.
14. If population parameter is not given then sample statistic can be used in large sample tests. True/False?
15. Name two methods to determine trend.

Q.2**(15)**

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. Find co-efficient of rank correlation

x	28	27	26	35	39	42	39	37	32	22
y	40	42	38	49	40	50	38	44	45	36

3. Find an appropriate line of regression to estimate y for $x = 80$.

$$\bar{x} = 72, \bar{y} = 15, \sigma_x = 12, \sigma_y = 4, r = 0.66.$$

4. Find trend by 5 yearly moving averages.

Year	1961	1962	1963	1964	1965	1966	1967	1968	1969
Sale	200	194	181	178	202	247	258	218	196
Year	1970	1971	1972	1973	1974				
Sale	201	203	191	189	203				

5. In a trivariate distribution $S_1 = 4.4, S_2 = 1.1, r_{12} = 0.8,$

$$r_{13} = -0.4, r_{23} = -0.56.$$
 Estimate regression coefficient of x_1, x_2 on x_3 .

Q.3 A) Two horses A and B were tested for running a particular track. The time (in seconds) taken by them are given below. (08)

Horse A	28	30	32	33	33	29	34
Horse B	29	30	30	24	27	29	

Can it be concluded that horse A is faster than horse B. ($t_{tab} = 1.796$)

OR

A) (08)

- (i) A machine is designed to produce insulating washers for electrical devices of average thickness of 0.025 cm. A random sample of 10 washers was found to have an average thickness of 0.024 cms. With a standard deviation of 0.02 cms. Test the significance of the mean. ($t_{tab} = 2.26$)

- (ii) 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

B) . The following yields were obtained by using three fertilizers in different plots. (07)

Fertilizer	Yield			
A	1	4	3	3
B	6	5	4	2
C	7	3	5	6

Test the hypothesis that there is no significant difference between the fertilizers. ($F_{tab} = 4.26$)

OR

B) The following figures relate to the price of a commodity in four different cities. Test at 5% that there is no significant difference in the four cities. ($F_{tab} = 3.49$) (07)

City	Price				
A	12	16	16		
B	15	14	14	15	
C	17	16	15	14	
D	15	12	15	16	16

Q.4 A) 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. (07)

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. ($Z_{tab} = 1.96$)

B)

(08)

1. Find expected frequencies for each given observed frequencies in the following data.

	Performance		Total
	Good	Not Good	
Trained	100	50	150
Untrained	20	30	50
	120	80	200

2. Write all required equations for quadratic trend.

3. What is correction factor for the following data

Operators	Machines			
	A	B	C	D
I	560	540	580	560
II	580	550	600	590
III	570	560	560	590

4. A random sample of 400 items gave mean 4.45 , population mean is 4 and variance 4. Calculate difference and standard error of mean.