

LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034



M.Com. DEGREE EXAMINATION – COMMERCE

FIRST SEMESTER – NOVEMBER 2019

PCO 1501 – ADVANCED BUSINESS STATISTICS

Date: 30-10-2019

Dept. No.

Max. : 100 Marks

Time: 01:00-04:00

PART - A

Answer ALL questions:

(10 x 2=20)

1. Define Statistics.
2. What is Standard Deviation?
3. Give the meaning of Statistical Quality Control.
4. Write a note on Kurtosis.
5. Define Regression.
6. An autonomous college has to select examiner from a list of 50 persons, 20 of them are women and 30 men, 10 of them know Hindi and 40 not, 15 of them being teachers and 35 not. What is the probability of the college selecting a Hindi-knowing women teacher?
7. From a moderately skewed distribution of retail prices for men's shoes, it is found that the mean price is Rs.20, and the median price is Rs.17. If the co-efficient of Variation is 20%, then what is the Pearson's Co-efficient of skewness of the distribution?
8. The average number of defectives in 23 samples of size 2000 rubber belts each was found to be 16 percent. Indicate how to construct the relevant control chart.
9. In a maternity home, 480 girl and 520 boy babies were born in a year. Do these figures confirm the hypothesis that boys and girls are born in equal numbers? (S.E at 5% level=1.96)
10. Draw a scatter diagram for the following data and indicate the nature of correlation.

X	1	2	3	4	5
Y	4	4	4	4	4

PART - B

Answer any FOUR questions:

(4x10=40)

11. Bring out the various methods of sampling.
12. Give an account of trend analysis.
13. ABC Ltd. is considering the following two mutually exclusive project for adoption.

Year	Project X Cost Profit (Rs. in Lakh)	Project Y Cost Profit (Rs. in Lakh)
1	10	5
2	5	25
3	20	45
4	40	30
5	60	30

Applying co-efficient of variation, find out which of the two is more risky project?

14. Apply regression, and estimate (a) the sale for advertising expenditure of Rs.100 lakhs, and (b) the advertisement expenditure for sales of Rs.47 Crores from the data given below:

Sales (in Crores)	14	16	18	20	24	30	32
Advertisement (in Lakhs)	52	62	65	70	76	80	78

15. Two samples are drawn from two normal population.

Sample 1	60	65	71	74	76	82	85	87	-	-
Sample 2	61	66	67	85	78	63	85	86	88	91

Using F test, find out whether the two populations have the same variance at the 5% level of significance.

($F=3.68$) at 5% level for $v_1=9$ and $v_2=7$.

16. Fit a straight line trend by the method of least square to the following data and calculate the trend value from 2010 to 2017. Assuming the same rate of change continues, what would be the predicted sales for the year 2019?

Year	2010	2011	2012	2013	2014	2015	2016	2017
Sales (in Lacs)	76	80	130	144	138	120	174	190

17. (a) Following information is available in respect of the ROI of two banking stocks A & B in different economic conditions:

Economic Condition	Probability	ROI of Stock A	ROI of Stock B
Recession	0.20	(-)15 %	20%
Normal	0.50	20%	30%
Boom	0.30	60%	40%

Find out the expected returns and Standard Deviation of these two stocks. Suppose, an investor has Rs.20,000 to invest, and he wishes to invest 75 percent in Stock A and the balance in Stock B, what will be the expected portfolio return?

- (b) The probability that a Construction Firm will get a plumbing contract is $\frac{2}{3}$ and the probability that it will not get an electrical contract is $\frac{5}{9}$. If the probability of getting any one contract is $\frac{4}{5}$, then what is the probability that it will get both contracts?

Answer any TWO questions:

(2x20=40)

18. Explain the scope of Statistics with suitable examples.

19. (a) To study the performance of three detergents and three different water conditions, the following

'Whiteness' readings were obtained with specially designed equipment:

Water Condition	Detergent A	Detergent B	Detergent C
Cold Water	57	55	67
Warm Water	49	52	68
Hot Water	54	46	58

Perform a two-way ANOVA, using 5% level of significance (Given $v_1=2, v_2=3$ and $F_{0.05}=6.94$)

(b) Compute Spearman's rank correlation for the following observed data, where the Judges awarded marks for 35.

Candidate	1	2	3	4	5	6	7	8
Judge A	20	22	28	23	30	30	23	24
Judge B	28	24	24	25	26	27	32	30

20. Quarterly sales data (Amt. in lacs) of a Chennai based Multi-brand retailer is presented in the following table:

Year	Q-I	Q-II	Q-III	Q-IV
2000	60	80	72	68
2001	68	104	100	88
2002	80	116	108	96
2003	108	152	136	124
2004	160	184	172	164

Calculate the seasonal index for each of the four quarters using ratio-to trend method.

21. (a) 1000 students at college level are graded according to their IQ and economic conditions. Use chi-square test to find out whether there is any association between economic condition and the level of IQ:

Economic Condition	High IQ	Medium IQ	Low IQ	Total
Rich	160	300	140	600
Poor	140	100	160	400
Total	300	400	300	1000

(b) Marks secured by students of Commerce Dept. who underwent remedial classes in Business Statistics are given below:

Sec. A: 80, 83, 79, 85, 90, 68 **Sec. B:** 82,84,60,72,86,67,91 **Sec. C:** 93, 65, 77, 78, 88

Use the H test to determine at 0.05 level of significance, whether the three sections are equally effective after attending remedial classes.
