LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

M.Com. DEGREE EXAMINATION – **COMMERCE**

FIRST SEMESTER – **NOVEMBER 2018**

18/17/16PCO1MC01 – ADVANCED BUSINESS STATISTICS

Date: 22-10-2018   Dept. No.   Max. : 100 Marks
Time: 01:00-04:00

PART - A

Answer ALL questions   (10 x 2=20)

1. Define Statistics.

2. Differentiate mean deviation from standard deviation.

3. The Regional Meteorological Centre states that the average rainfall in Tamil Nadu from Monday to Saturday was 0.3 cms. On account of heavy rainfall on Sunday, the average rainfall rose to 0.5 cms. Calculate the rainfall recorded on Sunday.

4. Draw a scatter diagram for the following data series and indicate its nature of correlation.

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

5. What is an asymmetrical distribution?

6. What is Meso Kurtic? How does it differ from Platy Kurtic?

7. Define Correlation.

8. A card is drawn at a random from a well shuffled pack of cards. What is the probability that it is diamond or a king?

9. Jack and Jill appear for an interview for two vacancies in the same post. The probability of the former is 1/7 and latter is 1/5. What is the probability of (a) both of them getting selected and (b) only one of them get selected.

10. What is meant by *p*-Chart?

PART - B

Answer any FOUR questions   **(4 x10=40)**

11. Whether Statistics is a science or an art? Explain illustratively.

12. Write short notes on: (a) Mann-Whitney U-test and (b) Wilcoxon Matched Pairs Test.

13. Analyse the following data using moments and comment upon its Skewness and Kurtosis.

X	0	5	2	6	4
f	5	10	15	20	25

14. Calculate Spearman's rank correlation coefficient from the following data:

X	68	64	75	50	64	80	75	40	55	64
Y	62	58	68	45	81	60	68	48	50	70

15. A retail investor is evaluating three financial options which have equal probabilities but the rate of returns are different. You are required to calculate the expected returns and risk of the investment proposal.

Probability	ROI of Stock A	ROI of Stock B	ROI of Stock C
0.1	0%	- 5%	6%
0.2	10%	0%	9%
0.3	12%	15%	12%
0.4	18%	25%	15%

16. It is generally believed that as people grow older, they find it harder to go to sleep. To test if there was a difference in time (in minutes) before people actually went to sleep after lying in the bed, a sample of 10 young persons (Age: 21 to 25) and 10 old persons (Age: 65 to 70) was randomly selected and their sleeping habits were monitored. The data shows the number of minutes these 20 persons were awake in bed before getting sleep:

Young Men	58	42	68	20	15	35	26	40	47	28
Old Men	100	152	147	70	40	95	68	90	112	58

Using rank sum test, ascertain whether there is any evidence that young men significantly take more time to get to sleep than old men. Apply 0.05 level of significance.

17. The median age of tourist who came to India is claimed to be 40 years. A random sample of 18 tourist gives the following ages: 24,18,37,51,56,38,45,45,29,48,39,26,38,43,62,30,66,41. Test the hypothesis using sign test at 0.05 level of significance.

PART - C

Answer any TWO questions (2 x20=40)

18. Examine in detail various fields in which statistics is applied. Also bring out the limitations of statistics.

19. From the given data, calculate Seasonal Indices by the ratio to moving average methods.

Year	Quarterly I	Quarterly II	Quarterly III	Quarterly IV
2011	68	62	61	63
2012	65	58	56	61
2013	68	63	63	67
2014	70	59	56	62
2015	60	55	51	58

20. A food company puts orange juice into cans advertised as containing 10 ounces of the juice. The weights of the cans immediately after filling for 20 samples are taken by a random method (at an interval of every 30 minutes). Each of the samples include 4 cans. The sample values are tabulated in the following table. The weights in the table are given in units of 0.01 ounces in excess of 10 ounces. For example, the weights of the juice drained from the first can of the sample is 10.15 ounces which is in excess of 10 ounces by 0.15 ounces (10.15-10.00=0.15). Since the unit in the table is 0.01 ounces, the excess is recorded as 15 units in the table. Construct an $\bar{x}$ chart to control the weights of orange juice for filling.

Sample Number	Weight of Each Can (4 Cans in Each Sample, n=4)			
	I	II	III	IV
1	15	12	13	20
2	10	8	8	14
3	8	15	17	10
4	12	17	11	12
5	18	13	15	4
6	20	16	14	20
7	15	19	23	17
8	13	23	14	16
9	9	8	18	5
10	6	10	24	20
11	5	12	20	15
12	3	15	18	18
13	6	18	12	10
14	12	9	15	18
15	15	15	6	16
16	18	17	8	15
17	13	16	5	4
18	10	20	8	10
19	5	15	10	12
20	6	14	12	14

(Table Value of A_2 for n=4 is 0.729)

21. To assess the significance of possible variation in the performance in NEET test among Schools in Chennai, a common test was given to a number of students taken at random from the HSC of each of the

four school concerned. The results are given below. Make one-way analysis of Variance of Data (ANOVA).

School - A	School - B	School -C	School -D
8	12	18	13
10	11	12	9
12	9	16	12
8	14	6	16
7	4	8	15

(Table value for F for $v_1=3$ and $v_2=16$ at 5% level of significance = 3.24)

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