



LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

M.Com.DEGREE EXAMINATION – COMMERCE

FIRSTSEMESTER – NOVEMBER 2017

17/16PCO1MC01 / CO 1812- ADVANCED BUSINESS STATISTICS

Date: 02-11-2017
Time: 01:00-04:00

Dept. No.

Max. : 100 Marks

Part-A

Answer ALL questions.

(10 x 2 marks)

(Use the enclosed Table: 'CASE SUMMARY: STUDENT CELEBRATIONS, LADY SRIRAM, NEW DELHI' to answer Qs. 1, 2, &3)

- (1) What are the 'ranges' for the variables 'P1Age', '&'P3Sleep'? ;
- (2) Calculate the \bar{x} for the variable 'P1Age' for 'Males' (refer variable 'P2Gend').
- (3) Combine the variables, 'P5AO', 'P6PT,' and 'P7TL' for students who have High scores (3) on the 'Easy Going' personality variable (refer variable 'P4EG').
- (4) Give any two types of transformation of data
- (5) What is Mann-Whitney test?
- (6) Enlist the components of time series.
- (7) Differentiate preventive cost from failure cost with a suitable example.
- (8) State two properties of a Kurticurve?
- (9) Explain 'alpha' error.
- (10) What is a ratio variable?

Part-B

Answer any FOUR questions.

(4 x 10 = 40 marks)

(Use the enclosed Table: 'CASE SUMMARY: STUDENT CELEBRATIONS, LADY SRIRAM, NEW DELHI' to answer Qs. 17)

- 11) The following Table, reflects the results obtained from a survey done by the DST, INDIA, on the relationship between Scientific Temper, and Social Progress, among Small Business Owners in India.

Test appropriate Hypothesis.

Social Progress	Scientific Temper		
	Very High	Medium	Low
Low	8	5	9
High	7	6	3

(Table Values of χ^2 : for 2 d. f. = 5.99; and 9.21, at 5%, and 1% sig. levels, respectively.)

12. From the following data, calculate 3-yearly, 5-yearly and 7-yearly moving averages.

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Cyclical Fluctuations	+2	+1	0	-2	-1	+2	+1	0	-2	-1	+2	+1	0	-2	-1

Also plot the data on a graph.

13. (a) What is p-Chart? Mention its advantages over C-Chart.

(b) The following data refer to defects found at the inspection of first 10 samples of size 100. Use them to obtain the upper control and lower control limits for percentage defective in the samples of 100. Represent the first ten sample results in the chart, you are required to show the central line and control limits of p-Chart and C-Chart.

Sample No.	1	2	3	4	5	6	7	8	9	10
No. of Defectives	2	1	1	3	2	3	4	2	2	0

14. The number of people enter the workspot on an average early morning shift, in a city based IT firm, are Presented below. Based on the tabular information can it be concluded that the the number of employees entering their work spots follow the Poisson law?

Employees Entering Workspots in Morning Shift

Entry Time	4.58	4.59	5.01	5.02	5.03	5.04	5.05
No. of Employees	450	300	200	100	50	20	5

15. The simple correlation coefficients between 'language competency' (X1), 'confidence' (X2), and 'achievement' (X3), are $r_{12} = 0.83$, $r_{13} = 0.79$, and $r_{23} = 0.90$. Calculate PCC $r_{12.3}$, and $R_{2.13}$.

16. The following table represents the number of minutes per day on prayer, by 10 Indian CEO's, as well as the turnovers related to their institutions.

No. of Minutes / day in Prayer {X}	11	78	12	46	44	116	20	58	85	52
Turnover (in crores) {Y}	120	665	126	884	617	497	358	492	520	605

Calculate Rank Correlation between the two variables and test at 0.05 % significance level.

17. a) For case no's. 1-10, Develop frequency Tables for the variables 'A1Wh', 'A2TOT' and 'A3FS.' (4 marks);
 b) For case no's. 1-6, create a new interval variable by combining variables P4EG, P5AO, P6PT, & P7TL. Name the variable as, 'LADY SRIRAM ETHOS'. Check for any association between this new variable and 'P3Sleep' (refer variable 'Sleep Time'), for case no's. 1 to 6 only.

Part-C**Answer any TWO questions in about four pages each.****(2 x 20 = 40 marks)**

18. Calculate the seasonal index by the ratio-to-moving method from the following data.

Year	Quarter I	Quarter II	Quarter III	Quarter IV
2013	75	60	53	59
2014	86	65	63	80
2015	90	72	66	85
2016	100	78	72	93

19. a) The incidence of young kids in Chennai affected by a Viral Game is 70%. The game is banned international as it changes the psychological balance of kids and is classified 'dangerous'. What is the probability that out of 6 children in your neighbourhood, 5 or more will be influenced by the game.

b) Answer any **TWO** of the following: a) What are the key differences between the 2-tailed and 1-tailed tests of hypothesis? b) Describe Non-parametric tests c) Explain Coefficient of Variation, using an example; d) Differentiate Binomial from Normal Distribution.

20. The following show the average productivity data (in '000s), among employees with varied 'Country of Origin' nationalities in their THREE International Offices abroad.

AVERAGE PRODUCTIVITY (\$ '000s) AMONG VARIED COO EMPLOYEES, IN FOUR INTERNATIONAL OFFICES			
INTERNATIONAL OFFICES	EMPLOYEES BASED ON COUNTRY OF ORIGIN (COO)		
	I	II	III
DUBAI	55	38	72
SINGAPORE	62	50	80
ROTTERDAM	75	77	61
NEWYORK	34	40	41

The above data relates to an MNC, I.T Firm, in Singapore. Find using 2 way Anova, whether there are differences in 'Productivity Data', between 'Employee Type', as well as within their 'International Offices'.

21. The following are a list of football fans during the matches held in three match venues, in the recently held FIFA under 17 Football event in India.

Kochin: 334, 286, 329, 260, 317

Kanpur: 411, 326, 350, 235, 284, 333

Bangalore: 382, 201, 252, 383, 172, 262, 232

Use the Kruskal Wallis or H test, at the 0.05 level of significance to test the null hypothesis that the three venues are equally popular crowd pullers.

CASE SUMMARY: STUDENT CELEBRATIONS. LADY SHRIRAM

Serial No.	P1Age	P2Gender	P3Sleep	P4EG	P5AO	P6PT	P7TL	A1Wh	A2TOT	A3FS	A4GI	A5SF	A6MC
1	25	1	12	1	1	1	3	5	5	4	2	3	1
2	22	2	4	1	2	2	1	1	5	5	3	5	1
3	26	2	6	2	3	3	3	5	5	2	1	5	1
4	22	1	7	2	1	1	2	3	3	1	3	1	5
5	23	2	11	3	3	1	3	4	2	3	3	2	2
6	23	2	7	3	2	1	1	3	4	2	3	1	4
7	25	2	8	1	2	1	3	3	3	2	1	1	2
8	23	1	9	3	3	1	2	2	4	4	1	4	1
9	17	1	8	3	2	3	3	4	4	4	3	5	2
10	25	2	3	1	1	1	2	1	1	5	1	3	5
11	25	2	12	3	2	1	1	2	1	4	3	5	2
12	18	2	3	2	1	1	3	4	1	1	2	4	3
13	25	2	12	2	2	3	1	3	2	4	2	5	1
14	18	1	6	2	1	3	1	4	4	3	4	1	4
15	18	2	3	2	2	2	2	4	3	1	1	3	3
16	17	1	7	2	2	3	2	3	5	3	4	5	5
17	18	2	7	1	1	2	2	5	2	2	5	5	1
18	17	1	11	2	2	3	1	3	5	2	2	3	4
19	26	2	5	2	1	1	2	4	1	1	5	1	3
20	21	2	10	2	3	2	2	4	5	4	3	5	3
Variable Label	AGE Age in Years	Gender	Sleep Time	Easy Going	Academic Orientation	Preparation Time	Talent Level	WHOLESOME ENTERTAINMENT	TEST OF TALENTS	FANTASTIC SETS	GREAT INVITEES	SPONSORED FOOD	MEDIA COVERAG E
Measurement	In years	1=Male; 2 = female	In hours	Respondent Personality is evaluated at 3 Levels: 3= high; 2= medium; 1= low				Ovations Quality was evacuee using the 5-point scale: 5= strongly agree; 4=Agree; 3= no opinion; 2=disagree; 1= strongly disagree					