LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

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

FIRSTSEMESTER – APRIL 2018

16PCO1MC01- ADVANCED BUSINESS STATISTICS

Date: 25-04-2018   Dept. No.   Max. : 100 Marks
Time: 09:00-12:00

Part-A   Answer ALL questions   (10 x 2 marks)

(Use the'STUDENT PERFORMANCE ANALYSIS'-Case Summary to answer Questions 1, 2, & 3)

1. Identify any two 'ordinal' variables.(1 mark); b) What is the 'range' for the variable 'P4Marks'? (1 mark).
2. Calculate the S_x for the variable 'P4Marks' for 'P2AGE' values LESS THAN 20 years. (2 marks)
3. What is the modal value for 'P2Age'?
4. Mention any two features of the 'Coefficient of Determination'.
5. Mention any TWO forms of kurtosis.
6. Identify TWO reasons why knowing the 'dimensions', and 'indicators', are important steps to be taken before undertaking any empirical study.
7. Mention any TWO Measures of central tendency.
8. What are 'moments'?
9. Mention any two features of a Hypothesis.
10. *What are the constants of a Poisson Distribution?*

PART – B   Answer any FOUR questions only   (4 x 10 = 40 marks)

11. The Contingency Table below summarises the relationship between 'Leader Type', and the 'Social Utility Index' of the businesses they run. Test appropriate Hypothesis.

Leader type	Social Utility Index of Business		
	High	Medium	Low
Authoritarian	130	170	50
Rule Based	120	140	70
Democratic	90	100	170

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

12. Write short notes on any TWO:
a) Differentiate parametric from non-parametric analysis; b) Explain the features of the Kruskal-Wallis or H test; c) Explain the Relevance and Utility of the Pascal's Triangle; d)Differentiate Binomial from Normal Distribution.

13. A coin is tossed 8 times. What is the probability of getting 6 or more heads?

14. A local survey on the food habits of Loyola Shift I students, taken during a recent conference, revealed that 120 out of a random sample of 375 college students, liked Vegetarian meals. In another survey of 1200 students during the year, in Christ College, Bangalore, it was observed that 500 liked Vegetarian meals. Is there a similarity between Chennai and Bangalore, on the proportion of students who like or prefer Vegetarian meals?

15. A sample of 144 batteries used by the new MagLev car is taken from a lot. The average life of a car battery is known to be 1500 kms, with a standard deviation of 15. Test whether the sampled car batteries are chosen from a battery population with an average of 2000 kms. Establish 95% confidence limits within which the average life of batteries are expected to lie.

16. *Given that r12=.8; r13=.9; r23=.5, what is r23.1, and R2.13?*

17. Help a college professor, by analysing the scores (marks) of two students in the following table, and choose the best one to be awarded the 'performer of the year award', given during the college day function.

Period	Total Marks Scored	
Semester	Student-A	Student-B
1	363	404
2	405	419
3	484	491
4	429	486
5	344	269

State reasons for your choice?

PART - C   **Answer any TWO only**   **(2 x 20 = 40 Marks)**
(Use the Case Summary—'STUDENT PERFORMANCE ANALYSIS' table to answer question No. 18)

18.Develop a new interval variable by combining variables starting with codes A1-A4 (the last four variables in the table). Develop a new cumulative frequency distribution of the new variable after coding it 'A4PROACADEMIC'. Give an appropriate label for the new variable (5 marks).
What is the correlation between the variables 'P4MARKS' and 'A4PROACADEMIC' for the case nos. 6 to 15? (15 marks)

19. a)An Arts and Science College in Chennai, has two popular courses, B.A (Eco) and B.A (Law), in their Economics Department. The former has 65% of the total students registered and the latter, 35%. 5% of the B.A (Law), and 3% of the B.A (Eco) students fail in the Language paper (Sanskrit). If a student who has failed in Sanskrit is drawn from the Economics department at random, what is the probability that the failed candidate belong to the B.A (Eco) and B.A (Law), courses?

b) What is Statistical Quality Control? Bring out its advantages and disadvantages.

20. The details of groundwater levels (in feet) in 4 zones of Chennai city are given below. Are there significant differences in zonal water table levels for the various water conservancy technologies used in the city? Test appropriate hypotheses using F-test.
b) TRANSFORM THE DATA, IF NECESSARY.

ZONE	Water Harvesting techniques used			
	I	II	III	IV
D	120	50	40	110
E	60	120	90	60
F	30	50	80	70

21. a) The following data provide the values of sample means and ranges for the following samples of a Range chart. Determine whether the process is under control.

Sample No.	1	2	3	4	5	6	7	8	9	10
Mean ($\bar{x}$)	10.10	11.99	11.23	10.18	10.92	10.81	10.85	11.78	11.44	11.10
Range (R)	9	5	8	7	5	6	6	9	7	8

(Conversion factors for n=6 are A2 = 0.483, D3 = 0, and D4 =2.004).   (15 marks)

(b) Mobile Chargers were examined for equality control test. The number of defective charging process for each charger is given below: 3,5,4,2,2,3,6,4,7,8,4,2,5,3,4,2,7,5,2,2. Prepare a c-Chart. What conclusion do you draw from it?   (5marks)

				STUDENT PERFORMANCE ANALYSIS' : Case Summary *				
Case No.	P1GENDER	P2AGE	P3EDUC	P4MARKS	A1DISCPLN	A2ACAORT	A3TEAPRO	A4ADINPRO
1	1	19	1	85	3	5	3	1
2	1	23	1	75	5	2	5	4
3	1	19	1	93	5	5	4	2
4	1	21	1	78	3	4	2	1
5	1	22	1	92	1	2	5	3
6	1	24	1	70	4	1	1	5
7	1	19	1	65	3	5	4	1
8	1	20	1	69	4	5	5	1
9	2	21	2	66	4	5	3	4
10	2	25	2	89	1	4	4	2
11	1	22	2	92	2	4	5	5
12	1	22	2	69	1	2	1	5
13	1	25	2	89	4	1	1	4
14	1	24	2	82	2	2	5	5
15	1	18	2	91	5	3	2	2
16	1	19	2	80	5	3	3	4
17	1	21	2	84	5	4	4	2
18	2	20	2	90	4	2	5	5
19	2	22	3	92	1	5	3	3
20	2	24	3	73	2	2	1	2
21	2	19	3	70	5	1	2	4
VARIABLE LABEL	Gender	Categories of Age	Educational Qualifications	Average Marks Acquired	Personal Discipline Level	Academic Orientation & Use Of Time	Proactive, and Caring Teachers	Proactive Administration & Infrastructure
	1 = Male	Actual Age	1=UG	Avg. Marks	5 point variable			
	2 = Female		2=PG	(Actual)	Value Label		Value Label	
			3=Others		1.00 Strongly disagree		4.00 Agree	
					2.00 Disagree		5.00 Strongly agree	
* imaginary values, used for test purposes only					3.00 No opinion			

(c) Explain the sign test with a suitable example. (5marks)