LOYOLA COLLEGE (AUTONOMOUS) CHENNAI – 600 034



Date: 05-05-2025

P.G. DEGREE EXAMINATION – CROSS DISCIPLINARY

SECOND SEMESTER - APRIL 2025



Max.: 100 Marks

PST2CD01 - STATISTICAL ANALYSIS

Dept. No.

Tin	ne: 01:00 PM - 04:00	PM									
		SECTION	A – K	1 (CO	1)						
	Answer ALL the quest	ions					$(5 \times 1 = 5)$				
1	Define the following										
a)	Conditional probability										
b)	Normal Distribution										
c)	Population and Sample										
d)	Chi-square test										
e)	Rank Correlation										
	<u> </u>	SECTION	A – K	2 (CO	1)						
2	Answer ALL the questions (5 x 1 =										
2	Fill in the blanks										
a)	The probability that a leap year will have 53 Sundays is										
b)	The range of Poisson distribution is										
c)	The degree of freedom of the chi-square distribution for the goodness of fit is										
d)	test is used to compare the means of two independent groups.										
e)	The range of Karl Pearson's coefficient of correlation is										
		SECTION	B – K	3 (CO	2)						
	Answer any THREE of the following $(3 \times 10 = 30)$										
3	A box contains 8 red, 3 white and 9 blue balls. 3 balls are drawn at random, find the probability that (a) all are red (b) all are white (c) 2 are red and 1 is white (d) at least one is white (e) one of each color is drawn.										
4	The local authorities in a certain city install 10,000 electric lamps in the street of the city. If these lamps have an average life of 1000 burning hours with a standard deviation of 200 hours, assuming normality, what number of lamps might be expected to fail (i) in the first 800 burning hours (ii) between 800 and 1200 burning hours?										
5	An intelligence test was	administered to 5 perso	ns bef	ore and	d after	they were tr	ained. The results are				
	as follows:	Candidates	1	2	3	4 5]				
		IQ (before training)	120	130	135	142 135					
		IQ (after training)	130	128	135	146 131]				
	Test whether there is an	y change in IQ after the	trainir	ig prog	gramm	e at 1% leve	l of significance.				

6	The following tal								e various	s days of the	
	week. Find the v								Cat		
		Days No. of acc	Sun cidents 14	Mon 16	Tues 8	Wed 12	Thurs 11	Fri 9	Sat 14		
7	Explain the types		La contraction de la contracti	10	O	12	11		17		
			SECT	ION C -	- K4 (C	O3)					
	Answer any TW	O of the fol	lowing							$(2 \times 12.5 = 2)$	
3	There are 3 boxes, box I contains 3 red and 7 green balls, box II contains 5 red and 3 green balls and both III contains 8 red and 4 green balls. One ball is drawn from one of the boxes and it is found to be rewith the probability that it comes from (i) Box I (ii) Box II and (iii) Box III.										
)	A manufacturer, who produces medicine bottles, finds that 0.1% of the bottles are defective. The bottle										
	are packed in boxes, each containing 500 bottles. A drug manufacturer boys 100 boxes from the produc										
	of bottles. Using poisson distribution, find how many boxes will contain:										
10	(i) no defective (i	11) at most 3	defective and	(111) atle	east two	defecti	ive bottle	es			
10	Calculate the Spe statistics from the		k correlation of	coefficie	ent betw	een ma	arks in ac	coun	tancy an	d marks in	
		Marks in	accountancy	52	63 45	36	72 65	47	25		
		Marks in	statistics	62	53 51	25	79 43	60	33		
.1	(i) Explain the procedure for testing of hypothesis.(ii) Differentiate between correction and regression.									(5.5	
	(11) Differentiate	between cor	rection and re	gression	1.					(7+5.	
			SECT!	ION D -	- K5 (C	O4)					
	Answer any ONE of the following									$(1 \times 15 = 1)$	
—	Calculate the regression equations of X on Y and Y on X form the following data.										
2	Calculate the reg	gression equa	ations of X on	Y and	Y on X	form th	e follow	ing d	ata.		
2	Calculate the reg	gression equa	X 10 12	13 1	Y on X :		e follow:	ing d	ata.		
2	Calculate the reg	gression equa	X 10 12	13 1	-	20		ing d	ata.		
12	Find the estimate		X 10 12 Y 5 6	13 1	17 18	20 2	24 30	ing d	ata.		
	Find the estimate Two researchers	e of X when `adopted diff	X 10 12 Y 5 6	13 1 7 9	17 18 9 13	20 Z 15 Z	24 30 20 21	g the	e same gi		
	Find the estimate Two researchers to find the number	e of X when adopted differ of students	X 10 12 Y 5 6 Y=26. Serent sampling salling in dif	g techniferent in	17 18 9 13 iques w	20 2 15 2 hile invace leve	24 30 20 21 vestigating	g the	e same gr	ollows:	
	Find the estimate Two researchers to find the number	e of X when `adopted differ of students Researcher	X 10 12 Y 5 6 Y=26. Ferent sampling in different Below Aver	g techniferent in	17 18 13 13 iques wantelliger	20 2 15 2 hile invace leve	24 30 20 21 Vestigation el. The reve Avera	g the	e same gr s are as fo Genius	ollows:	
	Find the estimate Two researchers to find the number	e of X when adopted differ of students Researcher A	X 10 12 Y 5 6 Y=26. Serent sampling in different Below Aver	g techniferent in	iques watelliger	20 2 15 2 hile invace leve	24 30 20 21 vestigation el. The rove Avera 44	g the	e same gr s are as for Genius 10	ollows:	
	Find the estimate Two researchers to find the number	e of X when adopted differ of students Researcher A B	X 10 12 Y 5 6 Y=26. Ferent sampling in difference Below Aver	g techniferent in	iques werage 60 33	hile invace leve	vestigatinel. The reve Avera 44 25	ng the esults	e same grass are as for Genius 10 2	follows:	
	Two researchers to find the number Would you say the	e of X when adopted differ of students Researcher A B hat the sample	X 10 12 Y 5 6 Y=26. Ferent sampling in different sampling in diffe	g technicity age A	iques wintelliger verage 60 33 ed by th	hile invace leve	vestigatinel. The reve Avera 44 25 esearche	ng the esults	e same grass are as for Genius 10 2	follows:	
	Find the estimate Two researchers to find the number	e of X when adopted differ of students Researcher A B hat the sample	X 10 12 Y 5 6 Y=26. Ferent sampling in different Below Aver 86 40 Ling technique 1.f and 3 d.f are	g techniferent in rage A	iques wintelliger werage 60 33 ed by the	hile invace leve Above e two recommendations are the recommendations are two recommendations are the recommendation are the recommendations are the	vestigatinel. The reve Avera 44 25 esearche	ng the esults	e same grass are as for Genius 10 2	follows:	
	Find the estimate Two researchers to find the number of the second seco	adopted differ of students Researcher A B hat the sample of χ^2 for 2 d	X 10 12 Y 5 6 Y=26. Ferent sampling salling in difference Selow Aver 86 40 Using technique of the selow A selo	g technicity age A	iques wintelliger werage 60 33 ed by the	hile invace leve Above e two recommendations are the recommendations are two recommendations are the recommendations are two recommendations are the recommendation are the recommendations are the	vestigatinel. The reve Avera 44 25 esearche	ng the esults	e same grass are as for Genius 10 2	ollows:	
	Two researchers to find the number Would you say the	adopted differ of students Researcher A B hat the sample of χ^2 for 2 d	X 10 12 Y 5 6 Y=26. Ferent sampling salling in difference Selow Aver 86 40 Using technique of the selow A selo	g techniferent in rage A	iques wintelliger werage 60 33 ed by the	hile invace leve Above e two recommendations are the recommendations are two recommendations are the recommendations are two recommendations are the recommendation are the recommendations are the	vestigatinel. The reve Avera 44 25 esearche	ng the esults	e same grass are as for Genius 10 2	ollows:	
13	Find the estimate Two researchers to find the number of the number of the find the number of the num	e of X when adopted differ of students Researcher A B hat the sample of χ^2 for 2 d	X 10 12 Y 5 6 Y=26. Ferent sampling salling in difference and sampling salling in difference and salling technique and salling technique and salling second salling salling second salling second salling second salling salling second	g techniferent in rage A es adopte e 5.991 ION E	iques watelliger werage 60 33 ed by the and 7.8: - K6 (C	hile invace leve Above two receives 2 respectives Cosponents	vestigation vel. The reve Avera 44 25 esearche ctively)	ag the esults	e same gras are as for Genius 10 2 significa	follows: $ \begin{array}{c} $	
.3	Find the estimate Two researchers to find the number of the second seco	e of X when adopted differ of students Researcher A B hat the sample of χ^2 for 2 d	X 10 12 Y 5 6 Y=26. Ferent sampling salling in difference and sampling salling in difference and salling technique and salling technique and salling second salling salling second salling second salling second salling salling second	g techniferent in rage A es adopte e 5.991 ION E -	iques watelliger werage 60 33 ed by the and 7.8: - K6 (C	hile invace lever Above two recommod respective to the control of	vestigation vel. The reve Avera 44 25 esearche ctively)	ag the esults	e same gras are as for Genius 10 2 significa	follows: $ \begin{array}{c} $	
13	Find the estimate Two researchers to find the number of the number of the find the number of the number o	e of X when adopted differ of students Researcher A B hat the sample of χ^2 for 2 decorated and the following and the following periods and the following periods are supplied to the following periods.	X 10 12 Y 5 6 Y 26 Ferent sampling in different sampling in differ	g techniferent in rage A	iques watelliger verage 60 33 ed by the and 7.8: - K6 (Contion between the second se	20 2 15 2 hile invace leve Above two re 2 respect O5)	vestigating l. The reve Avera 44 25 esearche ctively)	ag the esults	e same gras are as for Genius 10 2 significa	follows: $ \begin{array}{c} $	
13	Find the estimate Two researchers to find the number of the number of the find the number of the num	adopted differ of students Researcher A B hat the sample of χ^2 for 2 decorated and the sample of the following periods and the sample of the following periods are senting to the sample of the following periods are senting to the sample of the following periods are senting to the sample of the following periods are senting to the sample of the following periods are senting to the sample of the sampl	X 10 12 Y 5 6	g techniferent in rage A es adopte e 5.991 ION E correlate 67 6 65 6 6 65 6 6 65	iques wintelliger verage 60 33 ed by th and 7.85 - K6 (Contion bet) 67 68 68 72 ulations	20 2 15 2 hile invace leve Above e two recommod respective (a) 15 2 Ween X 69 72 6 are:	vestigating del. The reve Avera 44 25 essearche ctively)	ig the esults	e same gras are as for Genius 10 2 significa	follows: $ \begin{array}{c} $	
13	Find the estimate Two researchers to find the number of the number of the find the number of the number o	adopted differ of students Researcher A B hat the sample of χ^2 for 2 decorated and the following periods and the following periods are presented as a second control of the following period control of the following periods are presented as a second control of the following periods are presented as a second control of the following periods are presented as a second control of the following periods are presented as a second control of the following periods are presented as a second control of the follow	X 10 12 Y 5 6	g techniferent in rage A	iques wintelliger verage 60 33 ed by th and 7.8: - K6 (C) tion better 67 68 68 72 ulations 13 11	20 2 15 2 hile invace leve Above two re 2 respect O5)	24 30 21 20 21 21 21 21 21 2	ig the esults	e same gras are as for Genius 10 2 significa	follows: $ \begin{array}{c} $	
.3	Find the estimate Two researchers to find the number of the number of the find the number of the number o	adopted differ of students Researcher A B hat the sample of χ^2 for 2 d WE of the foll arl Pearson's mples drawn to S S	X 10 12 Y 5 6	g technicage A es adopte es 5.991 ION E - correlat 67 6 65 6 mal popu 11 1	iques wintelliger verage 60 33 ed by the and 7.8: - K6 (Contion between the second se	20 2 15 2 hile invace leve Above e two respective (Control of the control of the	24 30 21 20 21 21 21 25 25 25 26 27 26 27 27 27 27 27	ig the esults age sare	e same greater as for Genius 10 2 signification	ollows:	