

Day and Date: Tuesday, 14/06/2022

Time: 9.30 AM to 1.15 PM

Seat No:

Max. Marks- 100

Instructions:

- i. Q.1 is compulsory
- ii. Figure to the right indicate full marks
- iii. Use of non-programmable calculator is allowed

BT	CO's	Q. No.							Marks	
		Q.1	Attempt the following questions						40	
L3	210.1	a	Find Quartile Deviation from following data						8M	
			Marks	0-20	20-40	40-60	60-80	80-100		
			No. of students	12	20	25	18	5		
L3	210.1	b	Find median of the following distribution						8M	
			Class Int.	0-10	10-20	20-30	30-40	40-50		
			f_i	5	8	15	16	6		
L3	210.2	c	Following table showing the number of plants having certain characters. Test the hypothesis that flower color is independent of flatness of leaf at 5% level of significance.						8M	
			Flowers	Flat Leaves	Curled Leaves					
			White Flowers	99	36					
			Red Flowers	20	5					
			Given H_0 : The flower color is dependent of flatness of leaf.							
L3	210.3	d	A sample of 25 pairs of values of x and y has following results $\sum x = 127, \sum y = 100, \sum x^2 = 760, \sum y^2 = 449, \sum xy = 500$ Later on it was found that two pairs wrongly recorded as (8,14) & (8,6) instead of (8,12) & (6,8). Find corrected coefficient of correlation.						8M	
L3	210.3	e	Find line of regression of x on y from the following data						8M	
			x	1	2	3	4	5		6
			y	3	4	6	7	8		9

		Q.2	Attempt the following questions																										
L3	210.4	a	In a sample of 1000 students, the mean and standard deviation of marks obtained by the students in a certain test are 14 & 2.5. Assuming the distribution to be normal, find the number of students getting marks (i) between 12 and 15 (ii) above 18 (iii) below 8 (Given z area between z=0 & z=0.4 is 0.1554, between z=0 & z=0.8 is 0.2881, between z=0 & z=1.6 is 0.4452, between z=0 & z=2.4 is 0.4918)							8M																			
		b	A random variable x has following probability distribution <table><tr><td>x</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td></tr><tr><td>P(x)</td><td>k</td><td>2k</td><td>3k</td><td>k²</td><td>k² + k</td><td>2k²</td><td>4k²</td></tr></table> Find i) k ii) p(x>5) iii) p(1 ≤ x ≤ 4) OR In a large consignment of electric bulbs, 10 % are defective. A random sample of 20 is taken for inspection. Using Binomial distribution find the probability that (i) all are good bulbs (ii) at most 3 are defective bulbs (iii) at least two are defective bulbs.							x	1	2	3	4	5	6	7	P(x)	k	2k	3k	k ²	k ² + k	2k ²	4k ²	7M			
		x	1	2	3	4	5	6	7																				
P(x)	k	2k	3k	k ²	k ² + k	2k ²	4k ²																						
c	If a random variable x follows Poisson distribution such that p(1) = 2 p(2). Find (i) mean (ii) variance (iii) p(3)							5M																					
		Q.3	Attempt the following questions																										
L3	210.5	a	Solve $a_r - 4a_{r-1} + 4a_{r-2} = 2^r$ OR Solve $a_r - 2a_{r-1} + a_{r-2} = 3r + 5$						8M																				
		b	Solve $a_r + 2a_{r-1} + 2a_{r-2} = 0$ Given $a_0 = 0, a_1 = 1$						7M																				
		c	Solve $a_r - 6a_{r-1} + 8a_{r-2} = 0$						5M																				
		Q.4	Attempt the following questions																										
L3	210.3	a	Fit a second degree curve for the following data <table><tr><td>x</td><td>-2</td><td>-1</td><td>0</td><td>1</td><td>2</td></tr><tr><td>y</td><td>1</td><td>1.8</td><td>1.3</td><td>2.5</td><td>6.3</td></tr></table>						x	-2	-1	0	1	2	y	1	1.8	1.3	2.5	6.3	8M								
		x	-2	-1	0	1	2																						
		y	1	1.8	1.3	2.5	6.3																						
b	Fit a curve of the form $y = ab^x$ to the following data <table><tr><td>x</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td></tr><tr><td>y</td><td>144</td><td>172.8</td><td>207.4</td><td>248.8</td><td>298.5</td></tr></table>						x	2	3	4	5	6	y	144	172.8	207.4	248.8	298.5	7M										
x	2	3	4	5	6																								
y	144	172.8	207.4	248.8	298.5																								
c	Fit a straight line of the form y= a+ bx to the following data <table><tr><td>x</td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td></tr><tr><td>y</td><td>1</td><td>1.8</td><td>3.3</td><td>4.5</td><td>6.3</td></tr></table> OR Fit a curve of the form $y = ax^b$ to the following data <table><tr><td>x</td><td>1</td><td>2</td><td>3</td><td>4</td></tr><tr><td>y</td><td>2.5</td><td>8</td><td>19</td><td>50</td></tr></table>						x	0	1	2	3	4	y	1	1.8	3.3	4.5	6.3	x	1	2	3	4	y	2.5	8	19	50	5M
x	0	1	2	3	4																								
y	1	1.8	3.3	4.5	6.3																								
x	1	2	3	4																									
y	2.5	8	19	50																									
									5M																				
