CONTINUOUS INTERNAL EVALUATION- 2

Dept: AI/CD/CS	Sem / Div: III/ AI/CD/CS- A & B	Sub: Mathematics for Computer Science	S Code: BCS301
Date: 18/12/24	Time: 9:30-11:00 am	Max Marks: 50	Elective: N

Note: Answer any 2 full questions, choosing one full question from each part.

QN		Questions	Marks	RBT	COs
		PART A			
1	a	State Central Limit Theorem. An unknown distribution has the mean of 90 and the S.D of 15. Sample of size n=25 are drawn randomly from the population. Find the probability that the sample mean is between 85 and 92. $\phi(0.67)=0.2486$, $\phi(1.67)=0.4525$	8	L2	CO3
	b	A random sample of 10 boys have the following IQ 70, 120, 110, 101, 83, 88, 95, 98, 107, 100. Does this data support the assumption of a population mean IQ of 100 at 5% level of significance? ($t_{0.05}=2.262$ *for* 9 *d.f*)	8	L2	CO3
	c	No: of heads(x): 0 | 1 | 2 | 3 | 4 Frequency(f): 5 | 29 | 36 | 25 | 5 4 coins are tossed 100 times and the following results were obtained. Fit a binomial distribution for the given data and test the goodness of fit. ($\chi^2_{0.05}=9.49$ *for* 4 *d.f*)	9	L2	CO3
		OR			
2	a	An electrical firm manufactures light bulbs that have a length of life that is approximately normally distributed with the mean 800 hours and S.D of 40 hours. Find the probability that a random sample of 16 bulbs will have an average life of less than 775 hours. $\phi(2.5)=0.4938$ .Also state the theorem used to solve the problem.	8	L2	CO3
	b	A: 28 | 30 | 32 | 33 | 29 | 34 | 33 B: 29 | 30 | 30 | 24 | 27 | 29 Two horses A and B were tested according to the time (in seconds) to run a particular race with the following results. Test whether you can discriminate between the two horses. ($t_{0.05}$ *for* 11 *d.f* =2.201)	8	L2	CO3
	c	x: 0 | 1 | 2 | 3 | 4 f: 122 | 60 | 15 | 2 | 1 Fit a Poisson distribution for the following data and test the goodness of fit. Given that ($\chi^2_{0.05}=7.815$ *for* 3 *d.f*)	9	L2	CO3
		PART B			
3	a	In an exit poll, it was revealed that 600 voters in one locality and 400 voters from another locality favoured 55% and 48% respectively a particular party to come into power. Test the hypothesis that there is a difference in the opinion of the locality under 5% level of significance.	5	L3	CO3
	b	School I: 9 | 7 | 6 | 5 | 8 School II: 7 | 4 | 5 | 4 | 5 School III: 6 | 5 | 6 | 7 | 6	10	L3	CO4

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		A test was given to 5 students taken at random from the 5th class of 3 schools of a town. The individual scores are given below. Carry out the one way Analysis of Variance. Given F(2, 12)=3.88					
	c	Detergent	Engine			10	L3	CO4
			I	II	III			
		A	45	43	51			
		B	47	46	52			
		C	48	50	55			
		D	42	37	49			
		Perform a two way ANOVA test at 0.05 level of significance to check whether there are differences in the detergent or in the engine for the following data. Given F(3,6)= 4.76 and F(2,6)= 5.14					
		OR					
4	a	A sample of 100 bulbs produced by a company A showed a mean life of 1190 hours and S.D of 90 hours. Also a sample of 75 bulbs produced by a company B showed a mean life of 1230 hours and a S.D of 120 hours. Is there difference between the mean life of the bulbs produced by two company at 5% level of significance.				5	L3	CO3
	b	Plot of land	A	B	C	10	L3	CO4
		1	6	5	5			
		2	7	5	4			
		3	3	3	3			
		4	8	7	4			
		Set a one way analysis of variance table for the following per acre production data for the three varieties of wheat each drawn from 4 plots. State if there is a variety difference with respect to 5% level of significance. Given F(2,9)= 4.20					
	c	C 25	B 23	A 20	D 20	10	L3	CO4
		A 19	D 19	C 21	B 18			
		B 19	A 14	D 17	C 20			
		D 17	C 20	B 21	A 15			
		Analyze and interpret the following statistics concerning output of wheat for the field obtained as result of experiment conducted to test four varieties of wheat that is A, B, C and D under the Latin square design. Given F(3,6)=4.76					

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