

USN

BCS/BAD/BAI/BDS301

Third Semester B.E./B.Tech. Degree Examination, Dec.2024/Jan.2025 Mathematics – III for Computer Science Stream

Time: 3 hrs.

Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module. 2. VTU Mathematics Hand Book is permitted.

3. M : Marks , L: Bloom's level , C: Course outcomes.

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P = $1/6$ $1/2$ $1/3$ Image: Descent matrixDescent matrixc.Three boys A, B and C are throwing a ball to each other. A always throw the ball to B. B always throw the ball to A and C is just as likely to throw the ball to A as to B. Find the probability that C has the ball after three07L3CO3throws if C starts the game						
c.Three boys A, B and C are throwing a ball to each other. A always throw the ball to B. B always throw the ball to A and C is just as likely to throw the ball to A as to B. Find the probability that C has the ball after three07L3CO3throws if C starts the game			$P = \begin{bmatrix} 1/6 & 1/2 & 1/3 \end{bmatrix}$			
c.Three boys A, B and C are throwing a ball to each other. A always throw the ball to B. B always throw the ball to A and C is just as likely to throw the ball to A as to B. Find the probability that C has the ball after three07L3CO3throws if C starts the game			0 - 2/3 - 1/3			
c. Three boys A, B and C are throwing a ban to each other. A always throw 07 LS COS the ball to B. B always throw the ball to A and C is just as likely to throw the ball to A as to B. Find the probability that C has the ball after three throws if C starts the game			Thus have A D and C are throwing a ball to each other A always throw	07	13	CO3
the ball to A as to B. Find the probability that C has the ball after three throws if C starts the game		c.	the ball to B B always throw the ball to A and C is just as likely to throw			
the ball to A as to B. I had the producting that C has the ball after three throws if C starts the game			the ball to A as to B. Find the probability that C has the ball after three			
			throws if C starts the game.			

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		OR			
Q.4	a.	The joint prob. distribution for the following data, find $E(x)$ and $E(y)$.	07	L2	CO2
		Y -2 -1 4 5			
		X			
		1 0.1 0.2 0.0 0.3			
		2 0.2 0.1 0.1 0			
	b.	Show that the matrix	06	L2	CO3
		$P = \begin{vmatrix} 1/2 & 0 & 1/2 \end{vmatrix}$ is a regular stochastic matrix.			
			07	12	CO2
	c.	A gambler's luck follows pattern. If he wins a game the prob. of winning	0/	LJ	COS
		the next game is 0.0. However, if he loses a game, the proof of losing the first			
		next game is 0.7. There is an even chance of the gamoler winning the first			
		game. What is the proof of the winning the second game.			
	1	Module – 3			
0.5	a.	Define (i) Null hypothesis (ii) A statistic (iii) Standard error (iv) Level	07	L1	CO4
C		of significance (v) Test of significance.			
	b.	A coin was tossed 400 times and head turned up 216 times. Test the	06	L3	CO4
		hypothesis that the coin is unbiased at 5% LOS.			
	c.	In a city A 20% of a random sample of 900 school boys had a certain slight	07	L3	C05
		physical defect. In another city B, 18.5% of a random sample of 1600			
		school boys had the same defect. Is the difference between the proportions			
		significant at 5% significance level?			
0(UK UK	07	T 1	C04
Q.0	а.	(i) Type-I and Type-II errors	07	1.71	04
		(i) Statistical hypothesis			
		(iii) Critical region			
		(iv) Alternate hypothesis			
	b.	The average marks in Engg. Maths of a sample of 100 students was 51 with	06	L2	CO5
		S.D 6 marks. Could this have been a random sample from a population with			
		average marks 50?			
	c.	One type of aircraft is found to develop engine trouble in 5 flights out of a	07	L3	CO4
	1	total of 100 and another type in 7 flights out of a total of 200 flights. Is			
		there a significance difference in the two types of aircrafts so far as engine defects are concerned? Test at 0.05 significance level			
		Module – 4			
07	9	State central limit theorem. Use the theorem to evaluate $P(50 < x < 56)$	07	L2	CO4
V •7		where x represents the mean of a random sample of size 100 from an			
		where x represents the mean of a random sample of size roo nom an infinite population with mean $\mu = 53$ and variance $\sigma^2 = 400$			
	h	Suppose that 10, 12, 16, 19 is a sample taken from a normal population	06	L2	C05
	0.	with variance 6.25. Find 95% confidence interval for the population mean.	00	~-	
		Given that $Z(0.15) = 0.0596$.			
	c.	Fit a Poisson distribution to the following data and test for goodness of fit	07	L3	CO5
		at 5% LOS			
			1		
		$\begin{array}{c ccccccccccccccccccccccccccccccccccc$			
		$\begin{array}{c ccccccccccccccccccccccccccccccccccc$			
		$\begin{array}{ c c c c c c c c c c c c c c c c c c c$			

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 Q.8 a. Height of a random sample of 50 college student showed a mean 174.5 cms and a S.D 6.9 cms. Construct 99% confidence limits for the mean height of all college students. b. A random sample of 10 boys had the following I.Q : 70, 120, 110, 101, 883, 95, 98, 107, 100. DO these data support the assumption of the second state. 			
 b. A random sample of 10 boys had the following I.Q : 70, 120, 110, 101, 8 83, 95, 98, 107, 100. DO these data support the assumption of 	of 07	L2	CO4
 mean height of all college students. b. A random sample of 10 boys had the following I.Q : 70, 120, 110, 101, 8 83, 95, 98, 107, 100. DO these data support the assumption of 	he		
b. A random sample of 10 boys had the following I.Q : 70, 120, 110, 101, 8 83, 95, 98, 107, 100. DO these data support the assumption of			
83, 95, 98, 107, 100. DO these data support the assumption of	58, 06	L3	CO5
	a		
population mean I.Q of 100 (at 5% LOS)?			
c . The theory predicts the propositions of beans in the four groups, G_1 , G_2	2, 07	L3	CO5
G_3 , G_4 should be in the ratio $9:3:3:1$. In experiment with 1600 bea	ns		
the numbers in the groups were 882, 313, 287 and 118. Does t	he		
experimental support the theory.			
Module – 5			1
O 9 a The varieties of wheat A, B, C were shown in four plots each and t	he 10	L3	CO6
following vields in quintals per acre were obtained.			
$\begin{bmatrix} A & 8 & 4 & 6 & 7 \end{bmatrix}$			
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$			
C 2 5 4 4			
Test the significance of difference between the yields of varieties, give	/en		
that 5% tobulated value of $F = 4.26$ with (2, 9) d.f. Set up one-w	vay		
ANOVA and using direct method	-		
ANOVA and using direct method.	the 10) L3	CO6
b. Present your conclusion after doing rinks of the fertilizers which were us	sed		
Latin-square design conducted in respect of not retuined	h.		
on plots of different fertility. A(16) = B(10) = C(11) = D(9) = E(9)	and the		
F(10) = C(9) = A(14) = B(12) = D(11)	Y		
E(10) = C(9) = A(14) = D(12) = D(12) D(15) = D(8) = E(8) = C(10) = A(18)			
B(13) = D(6) = L(6) = C(10) = L(10) D(12) = E(6) = B(13) = A(13) = C(12)			
D(12) = E(0) = D(13) = F(7) = B(14)			
C(13) $A(11)$ $D(10)$ $D(1)$ $D(11)$			
OR			
O 10 Set on two way ANOVA table for the data given below, using cod	ing 1	0 L3	CO6
Q.10 a. Set up two-way AlvovA table for the data given below, and g	0		
Treatment			
Pieces of land A R C D			
$\begin{array}{c c c c c c c c c c c c c c c c c c c $			
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$			
Q 43 41 45 38 R 39 39 41 41	s is 1	0 L3	CO6
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$			1
b. There are three main brands of a certain power. A set of its 120 sale	and		
Description Description Q 43 Q 43 41 45 39 39 41 41 b. There are three main brands of a certain power. A set of its 120 sale examined and found to be allocated among four groups (A, B, C, D) b. There are three main brands of a certain power. A set of its 120 sale examined and found to be allocated among four groups (A, B, C, D)	and		
 b. There are three main brands of a certain power. A set of its 120 sale examined and found to be allocated among four groups (A, B, C, D) brands (I, II, III) as follows: 	and		
Q 43 41 45 38 Q 43 41 45 38 R 39 39 41 41 b. There are three main brands of a certain power. A set of its 120 sale examined and found to be allocated among four groups (A, B, C, D) brands (I, II, III) as follows: Groups Brands Groups Brands A D C D	and		
Q43414538Q43414538R39394141b.There are three main brands of a certain power. A set of its 120 sale examined and found to be allocated among four groups (A, B, C, D) brands (I, II, III) as follows:BrandsGroups ABCD	and		
Q 43 41 45 38 Q 43 41 45 38 R 39 39 41 41 b.There are three main brands of a certain power. A set of its 120 sale examined and found to be allocated among four groups (A, B, C, D) brands (I, II, III) as follows:BrandsGroups ABCDI04815	and		
Q 43 41 45 38 Q 43 41 45 38 R 39 39 41 41 b.There are three main brands of a certain power. A set of its 120 sale examined and found to be allocated among four groups (A, B, C, D) brands (I, II, III) as follows:BrandsGroups ABCDI04815II58136	and		
Q 43 41 45 38 Q 43 41 45 38 R 39 39 41 41 b.There are three main brands of a certain power. A set of its 120 sale examined and found to be allocated among four groups (A, B, C, D) brands (I, II, III) as follows:Brands $Groups$ A B C D I 0 4 8 15 II 5 8 13 6 III 18 19 11 13	and		
Q43414538Q43414538R39394141b.There are three main brands of a certain power. A set of its 120 sale examined and found to be allocated among four groups (A, B, C, D) brands (I, II, III) as follows:BrandsGroups ABCDI04815II58136III18191113Is there any significant difference in brands preference? Answer at	5%		
Image:	5% ct it		