Student Name: **University Roll No.:**	**Printed Pages: 01**
School of Engineering **First Theory Sessional Examination** **Even Semester (AS: 2024-25)** **B. Tech: CSE/AI/IOTBC/CCML [Year: II] [Semester : IV]**	
Course Title: Statistical and Numerical Technique **Course Code: NBS4401**	**Max Marks: 30** **Time: 1*hr***

Instructions: 1- Read the question Carefully.
2-Notations have usual meaning.

	SECTION 'A' **Q.N.1. Attempt all parts of the following:**	**Course Objective**	**Marks**
a)	Define rank correlation coefficient.	CO1	1
b)	What is UCL, LCL & CL of mean chart?	CO1	1
c)	Define t-distribution.	CO1	1
d)	Write the equations of regression lines y on x and x on y.	CO1	1
e)	Define Transcendental equation.	CO2	1

	SECTION 'B' **Q.N.2. Attempt any two parts of the following:**	**Course Objective**	**Marks**
a)	Find the correlation coefficient of the following data; x: 67, 68, 64, 68, 72, 70, 69, 70 y: 65, 66, 67, 67, 68, 69, 71, 73	CO1	7.5
b)	In a sample of 1000 cases, the mean of a certain test is 14 and S.D. is 2.5. Assuming the distribution to be normal, find (i) How many score above 18? (ii) How many score below 8? Given that $P(0< z <1.6) = 0.4452$ & $P(0< z <2.4)=0.4918$	CO1	7.5
c)	The following table gives a classification of a sample of 160 plants of their flower color and flatness of leaf. White Flower: Flat leaves 99, Coloured leaves 36, Total 135 Red Flower: Flat leaves 20, Coloured leaves 5, Total 25 Total: Flat leaves 119, Coloured leaves 41, Total 160 Test whether the flower's colour is independent of the flatness of the leaves. Given for 1 degree of freedom, chi-square at the level of significance 0.05 is 3.84.	CO1	7.5

	SECTION 'C' **Q.N.3. Attempt any one part of the following:**	**Course Objective**	**Marks**
a)	Find the correlation coefficient and obtain the equations of lines of regression for the following data: x: 6, 2, 10, 4, 8 y: 9, 11, 5, 8, 7	CO1	10
b)	Find a root of the equation $x^3 - 4x - 9 = 0$ correct to two decimal places by using Bisection method.	CO2	10
c)	An inspection of 10 samples of size 400 each from 10 lots revealed the following number of defective units 17, 15, 14, 26, 9, 4, 19, 12, 9, 15. Draw ***np-chart*** & comment on the process.	CO1	10

Table 1: Mapping between COs and questions

COs	Questions Numbers	Total Marks
CO1	1(a), 1(b), 1(c), 1(d), 2(a), 2(b), 2(c), 3(a), 3(b)	46.5
CO2	1(e), 3(b)	11