Reg.No: | | | | | | | |

SNS College of Technology, Coimbatore-35.

(An Autonomous Institution)
Internal Assessment -II
Academic Year 2023-2024 (Even)
Fourth Semester
(Common to Agri, Auto, Food Technology, Mech)

B

19MAT202 – STATISTICS AND NUMERICAL METHODS
(REGULATION 2019)

Time: 1.30 Hours **Maximum Marks: 50**

PART – A (5 x 2 = 10 MARKS)
ANSWER ALL QUESTIONS

		CO	Blooms
1.	State the three basic principles of design of experiments?	CO2	(Rem)
2.	Compare Randomized block design and Latin square design.	CO2	(Rem)
3.	Show that the Newton's Raphson formula for finding $\sqrt{a}$ is $x_{n+1} = \frac{1}{2}\left(\frac{x_n^2 + a}{x_n}\right)$, where a is positive.	CO3	(Und)
4.	Mention the sufficient condition for convergence of Gauss Seidal method.	CO3	(Und)
5.	By applying Gauss Jordan method, find the inverse of the matrix $\begin{pmatrix} 5 & -2 \\ 3 & 4 \end{pmatrix}$	CO3	(App)

PART –B (13+13+14 = 40 MARKS)
ANSWER ALL QUESTIONS

6.	a)	A textile company appoints four sales man A,B,C and D and observes their sales in three seasons' summer, winter and monsoon. The figures (in lakhs) are given in the following table.	CO2	(Ana) (13)

Season	Sales man			
	A	B	C	D
Summer	36	36	21	35
Winter	28	29	31	32
Monsoon	26	28	29	29

i) Do the salesman significantly differ in performance?

ii) Is there significant difference between the seasons?

(OR)

b) A variable trial was conducted on wheat with 4 varities in Latin Square design. The plan of the experiment and per plot yield are given below: CO2 (Ana) (13)

C25	B23	A20	D20
A19	D19	C21	B18
B19	A14	D17	C20
D17	C20	B21	A15

7. a) i) Determine an approximate root of $x\log_{10}x - 1.2 = 0$ by Newton Raphson method. CO3 (App) (6)

ii) Using Gauss Jordan method, Solve the following system equations: CO3 (App) (7)

$10x + y + z = 12$

$2x + 10y + z = 13$

$x + y + 5z = 7$

(OR)

b)i) Find the negative root of $x^3 - \sin x + 1 = 0$ using Newton's Raphson method correct to four decimal places. CO3 (App) (6)

ii) Using Gauss Jordan method, find the inverse of $\begin{pmatrix} 2 & 2 & 3 \\ 2 & 1 & 1 \\ 1 & 3 & 5 \end{pmatrix}$. CO3 (App) (7)

8. a) Analyze the variance in the following Latin square of yields (in kgs) of paddy where A, B, C, D denote the different methods of cultivation

CO2 (Ana) (14)

D122	A121	C123	B122
B124	C123	A122	D125
A120	B119	D120	C121
C122	D123	B121	A122

Examine whether the different methods of cultivation have given significantly different yields.

(OR)

b) Solve the system of equations by using Gauss Jacobi method and Gauss- Seidel method correct to 4 decimal places:

CO3 (App) (14)

$x - 7y + z = 10$

$2x + y - 8z = -15$

$6x - 3y + z = 11$

Rem/Und: Remember/ Understand **App:** Apply **Ana:** Analyze **Eva:** Evaluate

Cre: Create