Roll.No. | **20USTAT4004**

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(AUTONOMOUS)
(Affiliated to the University of Madras and Re-accredited with 'A+' Grade by NAAC)
Chromepet, Chennai - 600 044.
B.Sc Statistics - END SEMESTER EXAMINATIONS - NOVEMBER 2025
SEMESTER - IV
20USTAT4004 - Numerical Methods

Total Duration : 2 Hrs.30 Mins. Total Marks : 60

Section B

Answer any **SIX** questions $(6 \times 5 = 30$ Marks)

1. Explain the details about the following operators
   (i) Forward operator
   (ii) Backward operator
   (iii) Shifting operator
   (iv) Central difference operator
2. From the following table find the function f(x) and hence f(6) using newtons interpolation formula

X	1	2	7	8
f(x)	1	5	5	4

3. Apply Gauss forward formula to obtain f(x) at x= 3.5 from the table below

X	2	3	4	5
f(x)	2.626	3.454	4.784	6.986

4. Apply Gauss elimination method find the solution of following system
   10x+y+z=12
   2x+10y+z=13
   X+y+5z=7.
5. Derive the formula for Trapezoidal rule.
6. Construct the divided difference table upto third order.
7. Derive the Bessel's formula.
8. Derive the formula for bisection method.

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Section C

Answer any **THREE** questions $(3 \times 10 = 30$ Marks)

9. Explain the newton's forward interpolation formula for equal intervals.

10. Using Lagrange's interpolation formula. Find y(10) from the following data

x	5	6	9	11
y	12	13	14	16

11. From the following table find f(34) using Everett's formula

X	20	25	30	35	40
f(x)	11.4699	12.7834	13.7648	14.4982	15.0461

12. Find the positive root of $2x^3 - 3x - 6 = 0$ by using newton Raphson method correct to three decimal places.

13. Evaluate $\int_0^6 \frac{1}{1+x^2}\, dx.$

    By using(i) Simpson's one third rule. (ii) simpson's three by eighth rule.

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