ADAMAS UNIVERSITY

END-SEMESTER EXAMINATION : MAY 2021

(Academic Session: 2020 – 21)

Name of the Program:	B.TECH (CSE)	**Semester:**	VIII
Paper Title :	Numerical Analysis	**Paper Code:**	SMA44102
Maximum Marks :	40	**Time duration:**	3 hrs.
Total No of questions:	8	**Total No of Pages:**	1
	1. At top of sheet, clearly mention Name, Roll No., Enrolment No., Paper Name & Code, and Date of Exam. 2. Assumptions made if any, should be stated clearly at the beginning of your answer. 3. All parts of a Question should be answered consecutively.		

Instructions:

Attempt any three questions from **Section A** (each carrying 4 marks); any **Two Questions** from **Section B** (each carrying 10 marks)**.**

Section C is Compulsory (carrying 8 marks)**.**

Section A (Attempt **any Three)** $\mathbf{3 \times 4 = 12}$

1 i) Three approximate value of the number $\frac{1}{3}$ are given as 0.30, 0.33 and 0.34. Which of these three is the best approximation? **2+2**

ii) Find the quotient q = x/y, where x = 735.504, y = 15.38

2 Newton's forward interpolation formula to find $f(x)$ at $x = 2.5$ for the following data **4**

x	1	3	5	7	9	11	13	15
f(x)	1	7	20	55	100	208	345	510

3 Write the formula for composite Trapizoidal rule and explain geometrically. **4**

4 **Construct** the polynomial $f(x)$ by using Lagrange's interpolation formula from the following data. **4**

x	0	1	3	5
f(x)	5	7	30	56

Section B (Attempt **any Two)** $\mathbf{2 \times 10 = 20}$

5 i) Define quadrature formula. **2+8**

ii)Solve the following differential equations by Euler's method for $x = 1, h = 0.2$

$\frac{dy}{dx} = xy, y(0) = 1.$

6 i) Find the real root of equation $x^3 - 2x - 5 = 0$ by the Regulafalsi method correct to three decimal places. **5+5**

ii) Find the cubic root of 12 by using Nerton-Rapson formula correct to two decimal places with initial approximation 2.1.

7 Find the value of $\int_0^{\frac{\pi}{2}} e^{sinx}\, dx$ by using Simpson's $1/3^{rd}$ rule taking 6 equal subintervals. **10**

Section C(Compulsory) $\mathbf{1 \times 8 = 8}$

8 Solve the equation $\frac{dy}{dx} = x^2 - y^2, y(0) = 2$ by Runge-Kutta method of order 4 taking $h = 0.1$ at $x = 0.2$ **8**