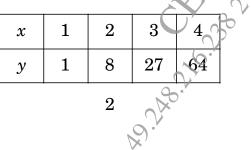
Total	No. of Q	uestions—8]	No. of Printed Pages—4							
Sea No			[5668]-159							
	S.E. (El	lectrical) (II Semester) EXA	MINATION, 2019							
NUMERICAL METHODS AND COMPUTER PROGRAMMING										
	Æ	(2015 PATTERN)	sS.							
Time	: Two H	Iours	Maximum Marks : 50							
<i>N.B</i> .	← (i)	Solve Q. No. 1 or Q. No. 2	2, Q. No. 3 Or Q. No. 4,							
	No.V	Q. No. 5 Or Q. No. 6, Q.	No. 7 or Q. No. 8.							
	(<i>ii</i>)	Neat diagrams must be drav	wn wherever necessary.							
	(iii)	Figures to the right indicate	full marks.							
	(iv)	Use of calculator is allowed.								
	<i>(v)</i>	Assume suitable data, if nec	cessary.							
		A N	9							
1.	(A) State	e the following statements are	correct or incorrect. Justify							
	your	answer :	[6]							
	<i>(i)</i>	In 'C' language, variable decla	aration can be started with							
		number								
	(ii)	In 'C' language, while loop	is exit controlled loop.							
	(iii)	In array declaration with int	A[3][3], eighteen number							
		data can be stored.								
	(B) State	e the following theorems	[7]							
5	<i>(i)</i>	Intermediate value theorem								
	(ii)	Descartes' rule of sign.								
		19.1×-	P.T.O.							
		v								

- 2. (A) Write meaning of the following instruction in 'C' language (if
 - *i* is a variable) : [6] (*i*) *i* + + and + + *i* (*ii*) *i*+=2 and *i**=2 (*iii*) *i*%2 and 2%*i*. (B) For the polynomial $f(x) = 5x^3 + 2x^2 - 6x + 13$, find f(2), f'(2), f''(2) and f'''(2). [7]
- (A) Derive the formula for Newton forward interpolation formula.
 [6]
 - (B) Use Regula-Falsi method to obtain $\sqrt{12}$. Use initial guess 3 and 4. Perform three iterations. [6]

Or

4. (A) Find root of equation f(x) = x³ - x - 1 = 0 using Bisection method for six iterations with initial approximation [1, 2]. [6]
(B) Find polynomial fitting the following data using Lagrange interpolation : [6]



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A river is 80 m wide. The depth d in meters at a distance 5. (A) x meters from one bank is given in the following table : [7]

x(m) 00 10	20	30	40	50	60	70	80
	7	9	12	15	14	8	3

Find approximately the area of cross section by : Trapezoidal Rule (i)Simpson's $\left(\frac{1}{3}\right)$ rd rule. (ii)

- Derive the formula of modified Euler's method for solution (B) of ordinary differential equation. [6]
- Derive the formula for trapezoidal rule for numerical integration 6. (A) using Newton Cote's formula. [6]
 - (B) Using fourth order RK method, find (0.1).

$$\frac{dy}{dx} = \frac{1}{x+y} \text{ with } y(0) = 1. \text{ Take } h = 0.1.$$

Find the values of x_1 , x_2 , x_3 , using Gauss elimination 7. (A) method : [6]

$$\begin{bmatrix} 1 & 1 & 1 \\ 2 & -3 & 4 \\ 3 & 4 & 5 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} = \begin{bmatrix} 9 \\ 13 \\ 40 \end{bmatrix}$$

(B) Explain Gauss-Jordon method for solution of linear simultaneous equation. [6] 3 P.T.O.

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8. (A) Solve the following system of equations using Gauss-Jacobi method. Initial values $0 \ 0 \ 0^{T}$. Show three iterations : [6] x_1 0 4 $-4 \left| \left| \begin{array}{c} \mathbf{x}_{2} \\ \mathbf{x}_{2} \end{array} \right| = \left| \begin{array}{c} 4 \\ 0 \end{array} \right|$ 8 4 Explain Gauss-Seidal method for solution of linear simultaneous (B) equation. (Numerical is not expected) [6] 4 Analian Anal [5668]-159

Or