Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV (NEW) EXAMINATION – SUMMER 2021

Subject Code:2140706 Date:06/09/2021

Subject Name:Numerical and Statistical Methods for Computer Engineering

Time:02:30 PM TO 05:00 PM Total Marks:70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

			Marks
Q.1	**(a)**	For a = 3.141592 and approximate value of a as 3.14 evaluate absolute error, relative error, and percentage error.	**03**
	(b)	Find a root of x^3-5x+3=0 by the bijection method correct up to four decimal places.	**04**
	(c)	Derive the iteration formula for √N and hence , find √65.	**07**
Q.2	**(a)**	Solve the following system of equations: x +3y +2z = 5 2x +4y – 6z = – 4 x + 5y +3z = 10	**03**
	(b)	Solve the following systems of equations using partial pivoting by the Gauss elimination method. 2x + 3y +x = 6 4x + 2y + 3z = 4 4x + y + z = 0	**04**
	(c)	Solve the following systems of equations using Gauss Jacobi method. 6x + 2y –z = 4 X + 5y +4z = 27	**07**
		OR	
	(c)	Use the Gauss-Seidal method to solve 6x + y + z = 105 4x + 8y + 3z = 155 5x + 4y – 10z = 65	**07**
Q.3	**(a)**	Write relation between Δ and E, ∇ and E.	**03**
	(b)	Determine the polynomial by Newton's forward difference formula from the following table.	**04**

x	0	1	2	3	4	5
y	–10	–8	–8	–4	10	40

	(c)	Employ Stirling's formula to compute y (35) from the following table.				**07**

x	20	30	40	50
y	512	439	346	243

OR

Q.3	**(a)**	Write relation between δ and E, μ and E.		**03**
	(b)	Using Langrange's interpolation formula , find the value of y when x= 10 from the following table		**04**

X	5	6	9	11
Y	12	13	14	16

	(c)	Using Newton's divided differences foemula, compute f(0.5)from the following table.		**07**

X	10	11	13	17
F(x)	2.3026	2.3989	2.5649	2.8332

Q.4 **(a)** Fit a straight line to the following data. **03**

X	1	2	3	4	6	8
Y	2.4	3	3.6	4	5	6

(b) State Trapezoidal rule with n = 10 and evaluate $\int_0^1 e^x dx$. **04**

(c) Find the value y for y' = x + y , y(0) = 1 when x= 0.1 , 0.2 with step size h = 0.05. **07**

OR

Q.4 **(a)** Fit a straight line to the following data. **03**

X	0	1	2	3	4
Y	1	1.8	3.3	4.5	6.3

(b) Using Simpsons 1/3 rule with n = 10 and evaluate $\int_0^1 e^x dx$. **04**

(c) Given that y= 1.3 and x = 1, and y' = 3x + y. Use the second order Runge- Kutta method to approximate y when x= 1.2. Use step size of x = 0.1. **07**

Q.5 **(a)** Calculate the mean for the following frequency distribution. **03**

Class	0-8	8-16	16-24	24-32	32-40	40-48
Frequency	8	7	16	24	15	7

(b) Calculate the first four movement of the following data. **04**

X	0	1	2	3	4	5	6	7	8
F	5	10	15	20	25	30	15	10	5

(c) Calculate the regression coefficient and find two line of regression from the following data. **07**

X	57	58	59	59	60	61	62	64
Y	67	68	65	68	72	72	69	71

OR

Q.5 **(a)** Calculate the arithmetic mean of the following marks obtained by students **03**

(b) Find the first four movements of the following data about the assumed mean 25 and actual mean. **04**

Class limit	0-10	10-20	20-30	30-40
Frequency	1	3	4	2

(c) Following data represents rainfall (x) and yield of paddy per hectare (y) in a particular area. Find the linear regression of x on y. **07**

X	113	102	95	120	140	130	125
Y	1.8	1.5	1.3	1.9	1.1	2.0	1.7

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