Enrollment No: _____ Exam Seat No:_____

C.U.SHAH UNIVERSITY

Summer Examination-2017

Subject Name : Computer Oriented Mathematical Reasoning
Subject Code : 4CS02IMR1 Branch :B.Sc.IT

Semester : 2 Date :04/05/2017 Time : 02:00 To 05:00 Marks :70

Instructions:

(1) Use of Programmable calculator & any other electronic instrument is prohibited.
(2) Instructions written on main answer book are strictly to be obeyed.
(3) Draw neat diagrams and figures (if necessary) at right places.
(4) Assume suitable data if needed.

Q-1 Attempt the following questions: (14)

a) If $y = x^3 - x^2 + 1$, then $\Delta^3 y =$ _____. **(1)**

b) The n^{th} order difference of the n^{th} degree polynomial is _____. **(1)**

c) Δx^{n+1} is equal to **(1)**
a) nx^{n-1} b) nx^n c) $n!$ None of these

d) Write the relation between E and ∇ . **(1)**

e) Prove that $\Delta\nabla = \Delta - \nabla$. **(1)**

f) Prove that :$\nabla = 1 - e^{-hD}$ **(1)**

g) The equation which remains untouched when elementary operations are carried out is called_____. **(1)**

h) What is the full name of LCM ? **(1)**

i) The Gauss-jordan method is an _____ method. **(1)**
a) direct (b) iterative (c) none of these

j) How many method are available to find initial solution of transportation problem? **(1)**

k) Write Lagrange's interpolation formula. **(2)**

l) Using backward difference , find the formula for $\frac{dy}{dx}$ at $x = x_0$. **(2)**

Attempt any four questions from Q-2 to Q-8

Q-2 Attempt all questions (14)

a) Using Gauss Jordan method solve the system of equations: **(07)**

$$x + 4y - z = -5; x + y - 6z = -12; x - y - z = 4$$

b) Apply Gauss elimination method to solve the given equations: **(07)**

$$x + y + z = 9; 2x - 3y + 4z = 1; 3x + 4y + 5z = 4$$

Q-3 **Attempt all questions** **(14)**

a) Apply Lagrange's formula to find $f(5)$ and $f(6)$ given that $f(1) = 2, f(2) = 4,$ $f(3) = 8, f(4) = 16$ and $f(7) = 128$. **(07)**

b) Construct Newton's forward interpolation polynomial for the following data:

x	4	6	8	10
y	1	3	8	16

Q-4 **Attempt all questions** **(14)**

a) Apply Newton's backward difference formula to the data below to obtain a polynomial of degree 4 in the argument: **(07)**

x	1	2	3	4	5
y	1	-1	1	-1	1

b) Using Gauss Jordan method solve the system of equations: **(07)**

$$x + 2y + z = 6; 2x + y - z = 1 ; x - y + z = 2$$

Q-5 **Attempt all questions** **(14)**

a) Construct a Backward difference table from the following values of x and y : **(07)**

x	0	5	10	15	20	25
y	7	11	14	18	24	32

b) Solve following system of equation using Gauss Elimination method: **(07)**

$$2x + y + z = 1; x + 2y + 3z = 4; x + 3y + 4z = 6$$

Q-6 **Attempt all questions** **(14)**

a) Find the missing term in the table: **(07)**

x	2	3	4	5	6
y	45.0	49.2	54.1	-	67.4

b) Determine the initial solution to the following transportation problem by using Vogel's Approximation Method. **(07)**

	D_1	D_2	D_3	supply
S_1	4	8	8	66
S_2	16	24	16	82
S_3	8	16	24	67
Demand	72	102	41	

Q-7 **Attempt all questions** **(14)**

a) Form the table of backward differences of the function **(07)**
$f(x) = x^3 - 3x^2 - 5x - 7$ for $x = -1, 0, 1, 2, 3, 4, 5$.

b) Determine the initial solution to the following transportation problem by using Least Cost Method. **(07)**

Plant	Distribution Center				Supply
	D_1	D_2	D_3	D_4	
P_1	1	3	1	4	30
P_2	3	3	2	1	50
P_3	4	2	5	9	20
Demand	20	40	30	10	100

Q-8 **Attempt all questions** **(14)**

a) Determine the interpolating of degree three using Lagrange's interpolation formula **(07)**

x	0	1	3	4
y	-12	0	12	24

b) Construct a forward difference table from the following values x and y. **(07)**

x	35	36	37	38	39	40	41
y	4.298	4.144	3.986	3.825	3.661	3.495	3.228