BBB-003-004104   Seat No. _____

B. Sc. (IT) (Sem. I) (Non CBCS) Examination

July - 2021

Fundamentals of Mathematics & Statistics

(Old Course)

Faculty Code : 003
Subject Code : 004104

Time : $2\frac{1}{2}$ Hours]   [Total Marks : 100

1 (a) Attempt any one :   **10**

(1) Use Newton's method and find form of $f(x)$.

$x:$	0	1	2	3
$f(x):$	1	3	7	13

(2) Interpolate y when $x = 0$.

$x:$	−2	−1	2	3
$y:$	−3	2	5	10

(b) Attempt any **one** :   **10**

(1) Fit $y = a + bx$ to the following data and estimate y when $x = 1998$.

$x:$	1992	1993	1994	1995	1996
$y:$	40	50	62	58	60

(2) Fit $y = a + bx + cx^2$ to the following data :

Year $(x):$	1960	1962	1964	1966	1968	1970	1972
Profit $(y):$	10	12	18	15	13	16	14

2 Any **two** :   **20**

(1) Solve LPP by Graph method.

$Z_{\max} = 50x + 30y,$

Subject to $2x + y \geq 18, x + y \geq 12, 3x + 2y \leq 34$.

(2) Solve LPP by Simplex method.

$Z_{\max} = 5x + 4y,$

Subject to $1.5x + 2.5y \leq 80, 2x + 1.5y \leq 70, x, y > 0$.

(3) Solve following TP by using LCM.

From

	D_1	D_2	D_3	D_4	Supply
S_1	8	10	7	6	50
To S_2	12	9	4	7	40
S_3	9	11	10	8	30
Demand	25	32	40	23	120

3 Any **two** :   **20**

(1) Write properties of correlation and regression.

(2) Find r from the data given below :

x :	48	49	50	51	52	53	54	55	56
y :	98	100	88	102	95	125	120	110	125

(3) Find $\bar{x}, \bar{y}$ and r from the regression lines

$9x - 5y - 2z = 0, \ 20x - 9y - 350 = 0$.

4 Any **four** :   **20**

(1) $\displaystyle\int_0^{75} l \cdot \frac{1}{4x + 5} \, dx$ by trapezoidal rule $h = 0.5$.

(2) Define square matrix, diagonal matrix.

(3) Solve by Gauss elimination method

$x_1 + 2x_2 + 3x_3 = 5, \ 2x_1 + 3x_2 + 4x_3 = 8, \ 3x_1 + 5x_2 + 6x_3 = 10$.

(4) Find inverse of A. if $A = \begin{bmatrix} 4 & 3 \\ 2 & 10 \end{bmatrix}$.

(5) If $A = \begin{bmatrix} 1 & 2 & 3 \end{bmatrix}$, $B^t = \begin{bmatrix} 4 & 5 & 6 \end{bmatrix}$ then show that

$\left(AB\right)^t = B^t \cdot A^t$.

5 Any **four** :   **20**

(1) Explain Bisection method.

(2) Apply R-K method and find

$y(0.1), \ h = 0.1, \ y' = y - x, \ y(0) = 2$.

(3) Explain N-R method.

(4) Explain Euler's modify method.

(5) Solve by Euler's method

$f(x \cdot y) = 3x^2 + y, y(0) = 4 \ h = 0.1$ find $y(0.3)$.