

STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI-86

(For candidates admitted during the year 2019 -2020)

SUBJECTCODE: 19MT/AC/MT35

B.Com. DEGREE EXAMINATION – December 2020

COURSE: ALLIED CORE

TIME: 90 MINUTES

PAPER: MATHEMATICS FOR COMMERCE

MAX.MARKS: 50

SECTION – A

ANSWER ALL THE QUESTIONS (3×2 = 6)

1. Show that $\begin{pmatrix} 0 & -1+i \\ 1+i & 0 \end{pmatrix}$ is skew-Hermitian.
2. Write the relation between the roots and the coefficients of the equation $x^3 - sx^2 + tx + u = 0$.
3. Define solution and feasible solution of a LPP.

SECTION - B

ANSWER ANY THREE QUESTIONS (3×8 = 24)

4. Express $\begin{pmatrix} 2 & 3 & 5 \\ 3 & 4 & 7 \\ 6 & 2 & 7 \end{pmatrix}$ as the sum of symmetric and a skew-symmetric matrix.
5. Solve $6x^5 - x^4 - 43x^3 + 43x^2 + x - 6 = 0$.
6. Find the real root of $x^3 - 4x + 9 = 0$ by Newton-Raphson method correct to three decimal places.
7. Show that $\left(1 + \frac{1}{2}\right) + \left(\frac{1}{3} + \frac{1}{4}\right)\frac{1}{9} + \left(\frac{1}{5} + \frac{1}{6}\right)\frac{1}{9^2} + \dots \infty = 9\log 3 - 12\log 2$

SECTION-C

ANSWER ANY ONE QUESTION (1×20 = 20)

8. a) Find the eigen values and eigen vectors for the matrix $A = \begin{bmatrix} 2 & -2 & 3 \\ 1 & 1 & 1 \\ 1 & 3 & -1 \end{bmatrix}$.

b) Form the equation one of whose root is $\sqrt{2} + \sqrt{3}$. (13+7)

9. a) Using simplex method solve the LPP

$$\text{Maximize } Z = x_1 + x_2 + 3x_3$$

$$\text{Subject to } 3x_1 + 2x_2 + x_3 \leq 3$$

$$2x_1 + x_2 + 2x_3 \leq 2$$

$$x_1, x_2, x_3 \geq 0.$$

- b) Prove that $\sum_{n=1}^{\infty} \frac{n^2+2}{n!} = 4e - 2$ (13+7)
