## **Vellore Institute of Technology**

## DEPARTMENT OF MATHEMATICS SCHOOL OF ADVANCED SCIENCES

## Summer Semester June–2022 Digital Assignment – I

Course Code : MAT2002 Slot : C

Course Name : AOD

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## **ANSWER ALL QUESTIONS**

1. Find the Fourier coefficient  $a_0$  of the function  $f(x) = x - \pi$  in  $-\pi < x < \pi$ 

2. If  $f(x) = x \cos x$  in  $0 < x < 2\pi$  then find the Fourier coefficients  $a_0$ 

3. Find the eigen values and eigen vectors of  $\begin{bmatrix} 3 & 1 & 4 \\ 0 & 2 & 6 \\ 0 & 0 & 5 \end{bmatrix}$ 

4. The Quadratic form corresponding to the symmetric matrix  $\begin{bmatrix} 1 & 2 \\ 2 & -4 \end{bmatrix}$ 

5. Verify Cayley – Hamilton theorem for the matrix  $A = \begin{bmatrix} 1 & 3 & 7 \\ 4 & 2 & 3 \\ 1 & 2 & 1 \end{bmatrix}$ 

and also use it to find  $A^{-1}$ .

6. Reduce the quadratic form  $3x_1^2 + 5x_2^2 + 3x_3^2 + 2x_1x_3 - 2x_1x_2 - 2x_2x_3$  to canonical form by orthogonal reduction.