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

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 $\mathrm{A} = \begin{bmatrix} 1 & 3 & 7 \\ 4 & 2 & 3 \\ 1 & 2 & 1 \end{bmatrix}$

   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.