

Total Marks: 10

Duration: 50 Minutes

Odd Sem: 2024-25

Q1. If the characteristic equation of a matrix has no term of degree 0 (i.e. has no constant term), then comment on the matrix whether it is singular or non-singular. Support your answer with reasons. (Marks-3)

Q2. Find two points on the line of intersection of the three planes $t = 0$, $z = 0$ and $x + y + z + t = 1$ in four-dimensional space. (Marks-3)

Q3. Find $f(t)$ as the solution of the integral equation (Marks-4)

$$f(t) = t + e^{-2t} + \int_0^t f(\tau)e^{2(t-\tau)}d\tau.$$