Q: The state equation of a second order system is
$$\dot{x}(t) = Ax(t), \quad x(0) \text{ is the initial condition.}$$
Suppose λ_1 and λ_2 are two distinct eigenvalues of A, and v_1 and v_2 are the corresponding eigenvectors.
For constants α_1 and α_2, the solution, $x(t)$, of the state equation is

(A) $\sum_{i=1}^{2} \alpha_i e^{\lambda_i t} v_{\mathbf{i}}$
(B) $\sum_{i=1}^{2} \alpha_i e^{2\lambda_i t} v_{\mathbf{i}}$
(C) $\sum_{i=1}^{2} \alpha_i e^{3\lambda_i t} v_{\mathbf{i}}$
(D) $\sum_{i=1}^{2} \alpha_i e^{4\lambda_i t} v_{\mathbf{i}}$

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