



12. (a) Explain the effects of poles and zeros on transfer functions in time domain.

Or

- (b) Explain the time domain analysis of a position control system using the unit step transient response.

13. (a) Explain the resonant peak and resonant frequency of the prototype second order system.

Or

- (b) Explain the effects of adding a zero to the forward path transfer functions in frequency domain.

14. (a) Explain the vector matrix representation of state equations. Determine the state-transition equation from the state diagram. (6+7)

Or

- (b) Explain the relation among controllability, observability and transfer functions. Explain the invariant theorems on controllability and observability. (6+7)

15. (a) Explain the frequency domain interpretation to design phase-lag control.

Or

- (b) Explain the time domain interpretation to design phase-lag control and phase-lead control.

PART C — (1 × 15 = 15 marks)

16. (a) How do you use the method of superposition in modeling a multi-input systems?

Or

- (b) List the properties of SFG. Define the various terms for the purpose of identification and execution of SFG algebra. (6+9)