



QP CODE: 25047508	 25047508	Reg No	:	
		Name	:	

M.Sc DEGREE (CSS) EXAMINATION, NOVEMBER 2025

Third Semester

M Sc ELECTRONICS

Core Course - EL010302 - CONTROL SYSTEMS

2019 ADMISSION ONWARDS

CF88DAA2

Time: 3 Hours

Weightage: 30

Part A (Short Answer Questions)

*Answer any **eight** questions.*

Weight 1 each.

1. What is transmittance?
2. What is the basis for framing the rules of block diagram reduction technique?
3. Define the following time domain specifications: a) Peak Overshoot b) Settling Time c) Steady State Error.
4. What are static error coefficients and dynamic error coefficients?
5. Investigate whether the system represented by the characteristic equation is stable or not.
 $5S^4 - 2S^3 + 3S^2 + 2s + 16 = 0.$
6. What do you mean by a polar plot?
7. What is the filter equivalent of a lag compensator?
8. Define i) state ii) state variable iii) state-space
9. What are RTU's What are their functions?
10. Explain briefly a scan cycle of PLC.

(8×1=8 weightage)

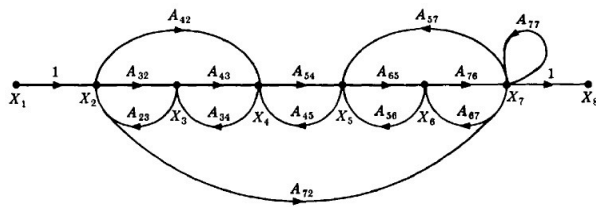
Part B (Short Essay/Problems)

*Answer any **six** questions.*

Weight 2 each.

11. Distinguish between open loop and closed loop control system
12. Consider the signal flow graph below and identify the following
a) Input node. b) Output node c) Forward paths d) Feedback paths e) Self loop f) Determine the loop gains of the feedback loops g) Determine the path gains of the forward paths





13. Which are the test signals used in control system? Explain their significances.
14. Explain different proportional controllers.
15. Explain the various steps for constructing root locus.
16. What are the advantages and drawbacks of frequency response analysis?
17. Briefly explain the various methods in decomposition of transfer functions.
18. List 5 commonly used digital input and output devices for PLCs.

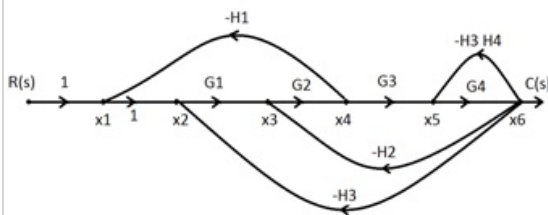
(6×2=12 weightage)

Part C (Essay Type Questions)

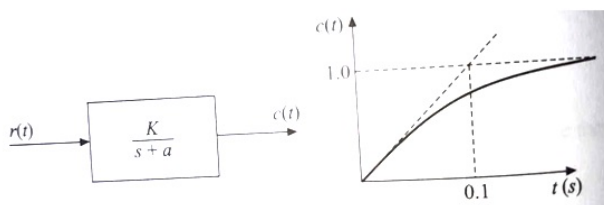
Answer any **two** questions.

Weight 5 each.

19. Use Mason's gain formula to find the transfer function of the signal-flow diagram shown:



20. A first order system and its response to a unit- step input are shown in figure. Determine the system parameters a and K .



21. Draw the Nyquist plot for the system whose open loop transfer function is $G(s)H(s) = \frac{k(1+s^2)}{s^3}$. Determine the range of K for stability





22. Explain the functions of the below ladder logic instructions with their symbols and examples :

- 1) Normally Open Contact
- 2) Normally Closed Contact
- 3) Output Coil
- 4) Timer
- 5) Counter

(2×5=10 weightage)

