



MSc DEGREE (CSS) EXAMINATION, DECEMBER 2025

First Semester

M.Sc APPLIED ELECTRONICS

Core Courses - EL020102 - NETWORK AND CONTROL SYSTEMS

2019 Admission Onwards

C0273F9A

Time: 3 Hours

Weightage: 30

Part A (Short Answer Questions)

Answer any **eight** questions.

Weight 1 each.

1. What is time constant of RL circuit?
2. Define Node.
3. Define Stability.
4. Define Transfer Function.
5. Define parabolic signal.
6. Define Delay time.
7. Give the relation between generalized and static error coefficient.
8. Draw the polar plot of $G(s) = \frac{1}{s^2(1+sT_1)(1+sT_2)}$
9. What is Nichols chart?
10. What is meant by derivative control?

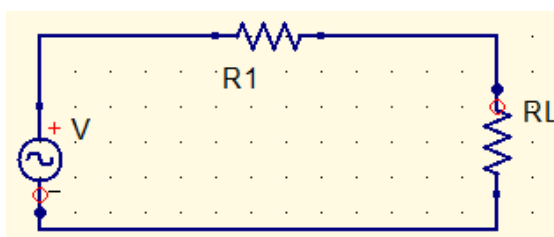
(8×1=8 weightage)

Part B (Short Essay/Problems)

Answer any **six** questions.

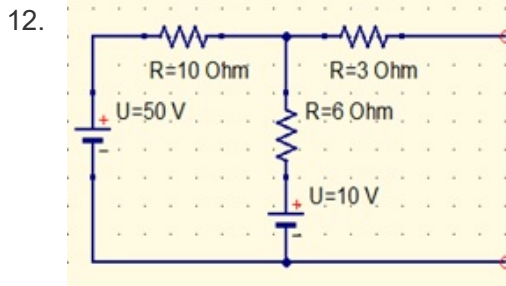
Weight 2 each.

11.

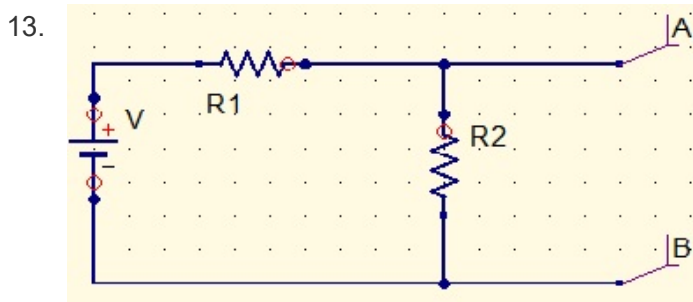


Determine the value of load resistance when the load resistance draws maximum power. Find the value of the maximum power. $V=50V, R_1=25 \text{ Ohm}$.





Find Thevenin's equivalent circuit for the circuit shown in figure:



Determine Norton's equivalent circuit for the circuit shown in figure. Where $V=50V$, $R_1=25\text{ Ohm}$, $R_2=4\text{ Ohm}$.

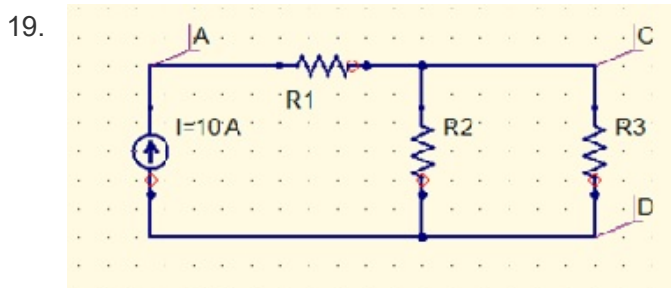
14. Explain the operating principle of stepper motor.
15. Explain the significance of poles and zeros in stability analysis.
16. State the rules for constructing root locus..
17. Explain the determination of gain margin and phase margin from polar plot.
18. Explain lead compensator?

(6×2=12 weightage)

Part C (Essay Type Questions)

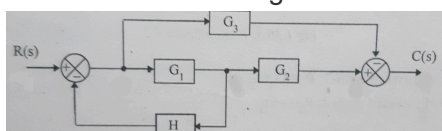
Answer any **two** questions.

Weight 5 each.



Verify the reciprocity theorem shown in figure. $R_1=2\text{ Ohm}$, $R_2=2\text{ Ohm}$, $R_3=1\text{ Ohm}$

20. Reduce the block diagram shown in figure and find C/R .





21. Derive the steady state error when the input is unit ramp signal for type 0, type 1 and type 2 systems?

22. Plot the bode diagram for the following transfer function $G(s) = \frac{10}{s(1+4s)(1+0.25s)}$.

(2×5=10 weightage)

