

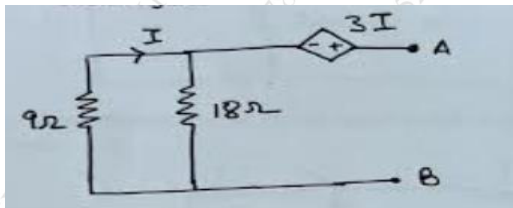
Time: 2 Hours

Marks: 60

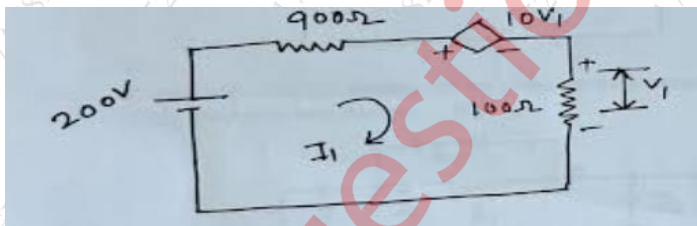
- N.B. (1) Question No.1 is compulsory.
 (2) Answer any three from the remaining five questions.
 (3) Assume suitable data if required.
 (4) Figures to the right indicate full marks.

Q1. Attempt any five (15)

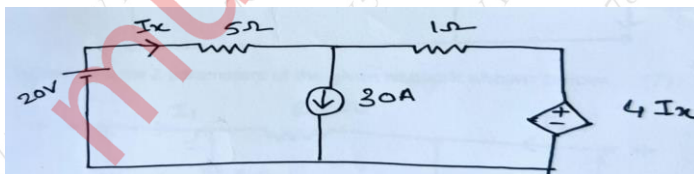
- Define gain crossover frequency and gain margin in bode plot.
- State the general rules for constructing a root locus plot.
- Define open loop and closed loop control systems with examples.
- Find the Thevenin equivalent resistance of the circuit across the terminal A-B for the shown figure.



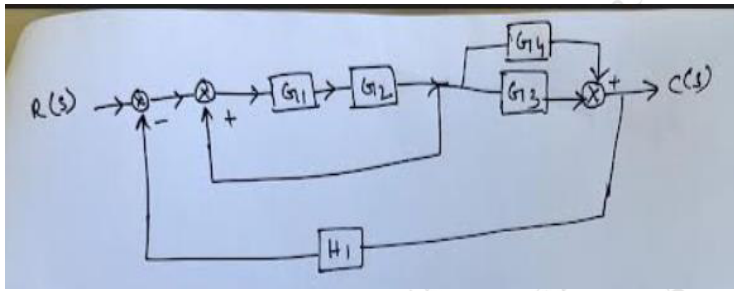
- Define reciprocity and symmetry in two port networks.
- Find the current I_1



Q2 a) Find the current I_x the figure given below using Superposition theorem. (8)



Q5 a) Using Block Diagram reduction technique, find close loop transfer function $C(S)/R(S)$. (8)



b) Check whether the system is stable or unstable.

$$S^6 + 3S^5 + 2S^4 + 9S^3 + 5S^2 + 12S + 20 = 0 \quad (7)$$

Q6 a) Sketch the root Locus for a unity feedback control system with an open loop transfer function .

$$G(S) = \frac{K}{s(s+1)(s+2)} \quad (8)$$

b) Draw the Bode plot of the system.

$$G(S)H(S) = \frac{8}{s(s+1)(s+4)} \quad (7)$$