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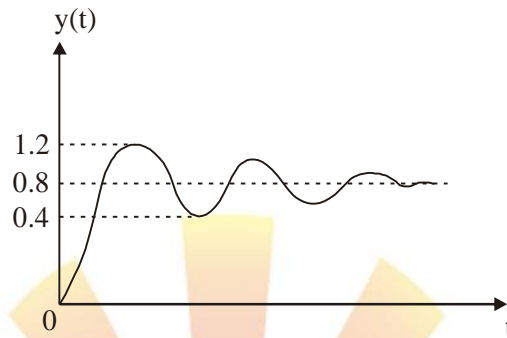


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1. A step response of a negative unity feedback system with open loop transfer function $G(s) = \frac{K}{(s+1)^2(s+2)}$ is shown in figure.

The value of K is _____



Sol. K = 8

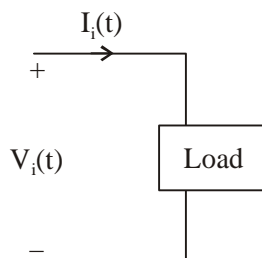
2. Consider a open loop transfer function $G(s) = \frac{1}{(s+1)(s+2)}$ with negative unity feedback system the steady state error in output for an unit step input is

Sol. 0.67

3. Given $V_i(t) = 5 - 10 \cos(\omega t + 60^\circ)$

$$I_i(t) = 5 + X \cos(\omega t)$$

The value of X in amp such that the average power on the load is zero



Sol. 10 Amp



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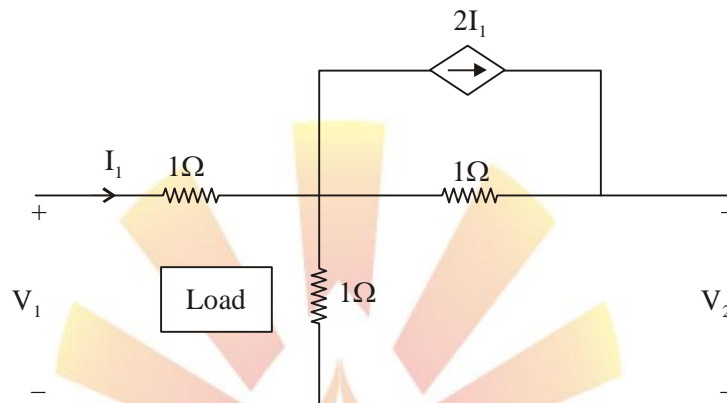
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4. A parallel RC connection with Series on inductor value of $R = 100\Omega$, $C = 100 \mu\text{F}$. If power factor is unity at $\omega = 100 \text{ rad./sec}$. The equivalent Z_m in ohm will be –

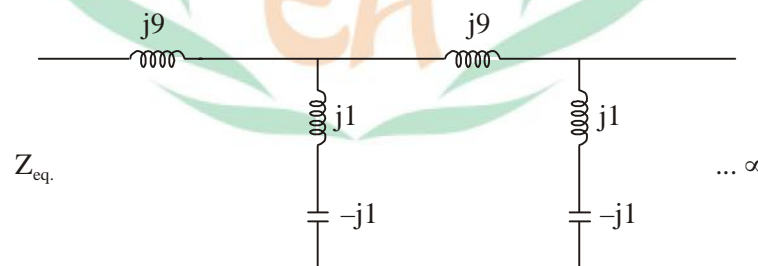
Sol. 50 Ω

5. Consider two port network shown in below figure, the value of $h_{11} = \frac{V_1}{I_1} \mid V_2 = 0$ in Ohm is



Sol. 0.5 Ω

6. Consider a reactive ladder infinite network as shown below :-



The value of magnitude of Z_{eq} for infinite network in ohm will be :-

Sol. 12 Ω

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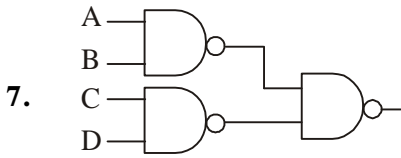
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The output of Y is

Sol. $Y = A + B + C + D$

8. A network consists 5 loop equation and 8 node calculation number of branch in the network

- (a) 11 (b) 12
(c) 15 (d) 14

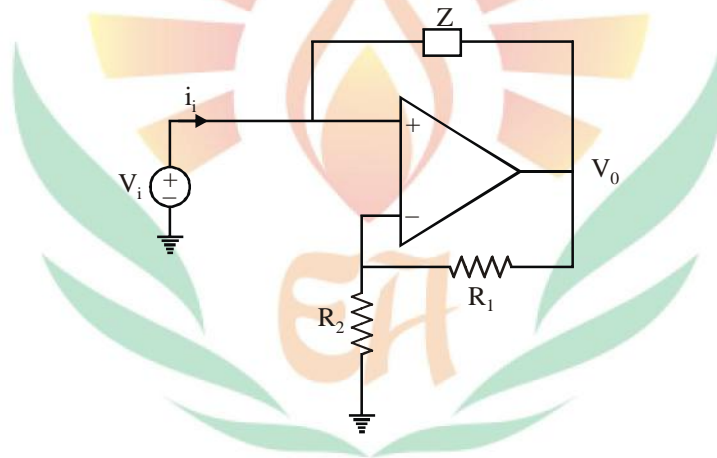
Sol.

$$l = b - (n - 1)$$

$$5 = b - (8 - 1)$$

$$b = 12$$

9.



Calculate the ratio of $\left(\frac{V_i}{i_1}\right)$

- (a) $\left(1 + \frac{R_1}{R_2}\right)Z$ (b) $-\left(\frac{R_1}{R_2}\right)Z$
(c) $-\left(\frac{R_1}{R_1}\right)Z$ (d) $\left(\frac{R_1}{R_1}\right)Z$

Sol. (c)

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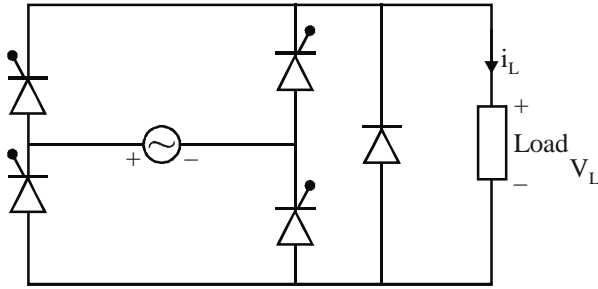
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10. In shown figure thyristor are connected antiparallell to the load.



then

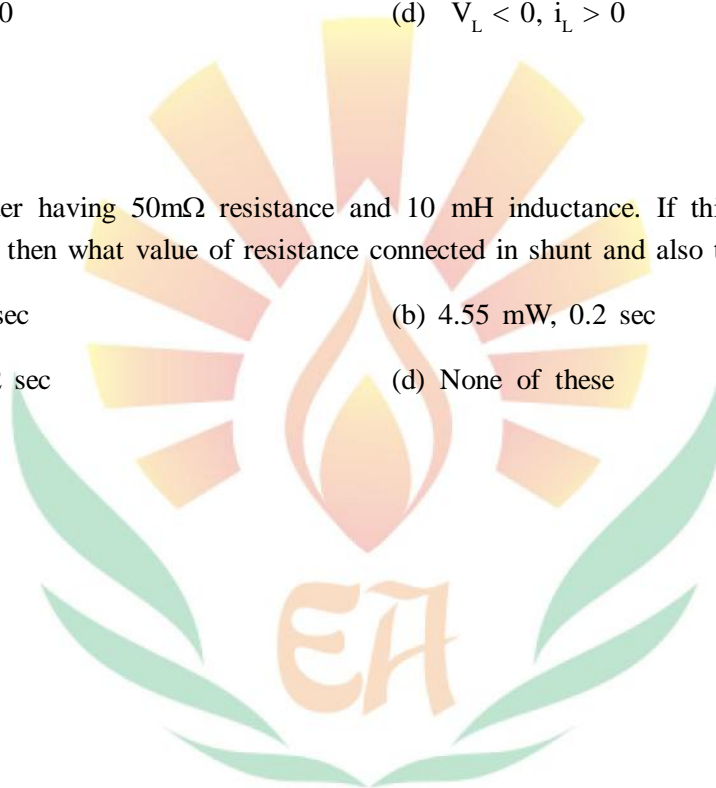
- (a) $V_L < 0, i_L > 0$ (b) $V_L < 0, i_L < 0$
(c) $V_L > 0, i_L < 0$ (d) $V_L < 0, i_L > 0$

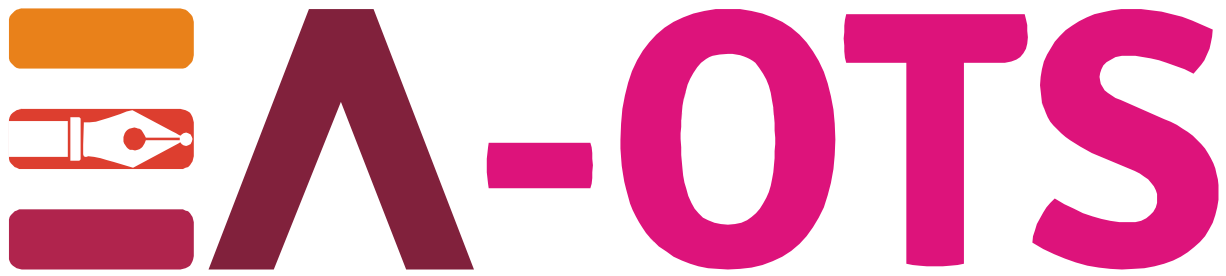
Sol. (a)

11. A (0–1) A ammeter having $50\text{m}\Omega$ resistance and 10 mH inductance. If this ammeter is converted in (0–10) A ammeter then what value of resistance connected in shunt and also time period of instrument.

- (a) $5.55\text{ m}\Omega, 2\text{ sec}$ (b) $4.55\text{ m}\Omega, 0.2\text{ sec}$
(c) $5.55\text{ m}\Omega, 0.2\text{ sec}$ (d) None of these

Sol. (a)





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