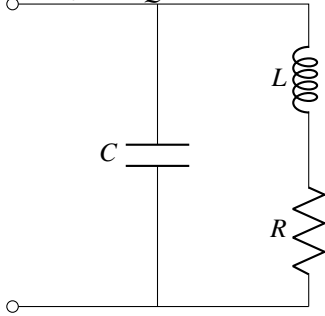


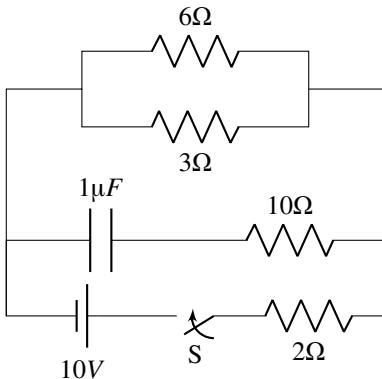
EE : Electrical Engineering

AI24BTECH11022 - Pabbuleti Venkata Charan Teja

- 27) An inductor having a Q -Factor of 60 is connected in series with a capacitor having a Q -factor of 240. The overall Q -factor of the circuit is _____. (round off to nearest integer) (2022)
- 28) The network shown below has a resonant frequency of 150kHz and a bandwidth of 600Hz . The Q -factor of the network is _____. (round off to nearest integer) (2022)



- 29) The maximum clock frequency in MHz of a 4-stage ripple counter, utilizing flip-flops, with each flip-flop having a propagation delay of 20ns , is _____. (round off to one decimal place) (2022)
- 30) If only 5% of the supplied power to a cable reaches the output terminal, the power loss in the cable, in *decibels*, is _____. (round off to nearest integer) (2022)
- 31) In the circuit shown below, the switch S is closed at $t = 0$. The magnitude of the steady state voltage, in *volts*, across the 6Ω resistor is _____. (round off to two decimal places) (2022)



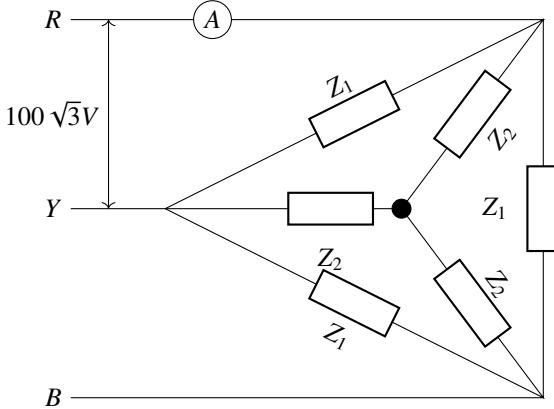
- 32) A single-phase full-bridge diode rectifier feeds a resistive load of 50Ω from a 200V , 50Hz single phase AC supply. If the diodes are ideal, then the active power, in *watts*, drawn by the load is _____. (round off to nearest integer) (2022)

- 33) The voltage at the input of an AC-DC rectifier is given by $v(t) = 230\sqrt{2}\sin\omega t$ where $\omega = 2\pi \times 50\text{rad/s}$. The input current drawn by the rectifier is given by

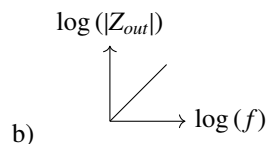
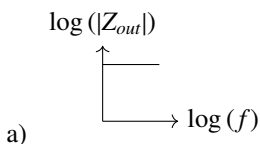
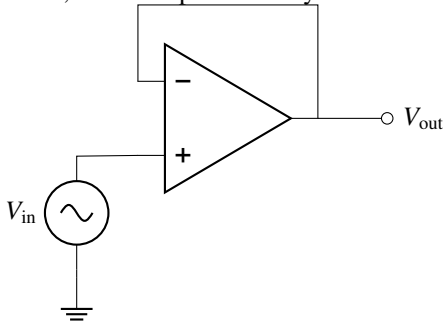
$$i(t) = 10 \sin\left(\omega t - \frac{\pi}{3}\right) + 4 \sin\left(3\omega t - \frac{\pi}{6}\right) + 3 \sin\left(5\omega t - \frac{\pi}{3}\right)$$

The input power factor, (rounded off to two decimal places), is, _____ lag. (2022)

- 34) Two balanced three-phase loads, as shown in the figure, are connected to a $100\sqrt{3}\text{V}$, three-phase, 50Hz main supply. Given $Z_1 = (18 + j24)\Omega$ and $Z_2 = (6 + j8)\Omega$. The ammeter reading, in amperes, is _____. (round off to nearest integer) (2022)



- 35) The frequencies of the stator and rotor currents flowing in a three-phase 8-pole induction motor are 40Hz and 1Hz , respectively. The motor speed, in rpm, is _____. (round off to nearest integer) (2022)
- 36) The output impedance of a non-ideal operational amplifier is denoted by Z_{out} . The variation in the magnitude of Z_{out} with increasing frequency, f , in the circuit shown below, is best represented by (2022)



a) $\zeta = 0.5$ and $w_n = 10rad/s$

b) $\zeta = 0.1$ and $w_n = 10rad/s$

c) $\zeta = 0.707$ and $w_n = 10rad/s$

d) $\zeta = 0.707$ and $w_n = 100rad/s$