KATHMANDU UNIVERSITY
School of Engineering
Department of Electrical and Electronics Engineering
Second Internal

Level: UNG/CE
Year: I
Time: 1 Hrs.

Course: ENGG 112
Semester: II
F.M.: 15

Date: 15th March 2025

Attempt any three questions. [3 Q. x 5 marks = 15 marks)

1. Find the average and rms value of the periodic waveform of figure-1 over one full cycle. [5]

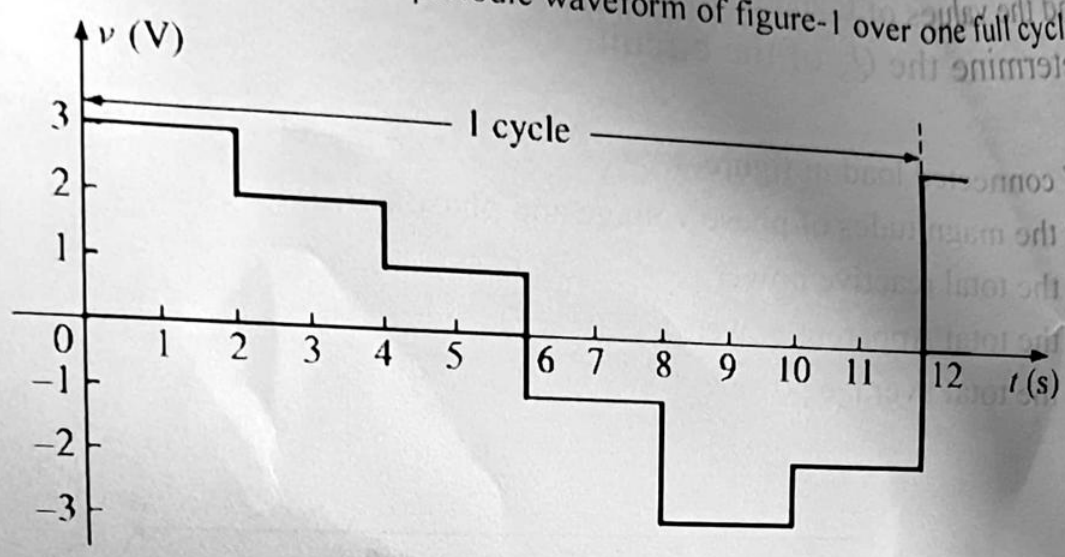


Figure-1

2. An inductance of 0.6H, a resistor of 100Ω and a capacitor of 30μF are connected in parallel across a 230V, 50Hz supply. Find the current through each branch, circuit phase angle, power dissipated in the circuit and total circuit impedance. Also draw the phasor diagram for voltages and currents in the circuit. [5]
3. Using Nodal analysis, determine the voltage across the capacitive reactance in the circuit of figure-2. [5]

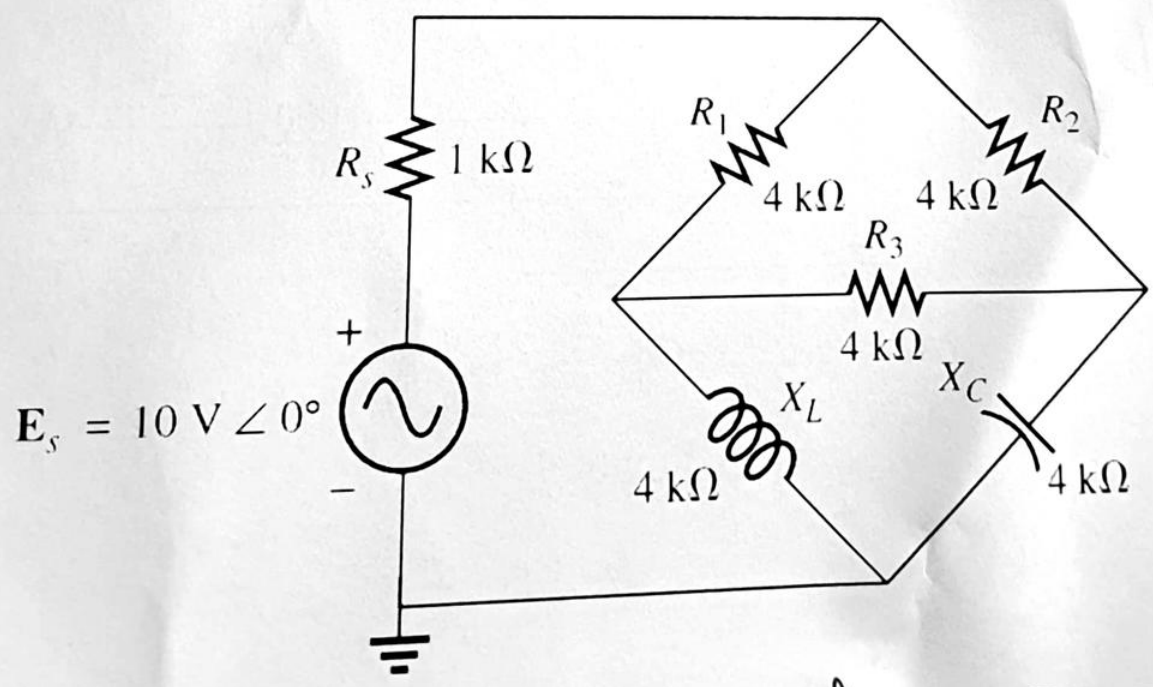
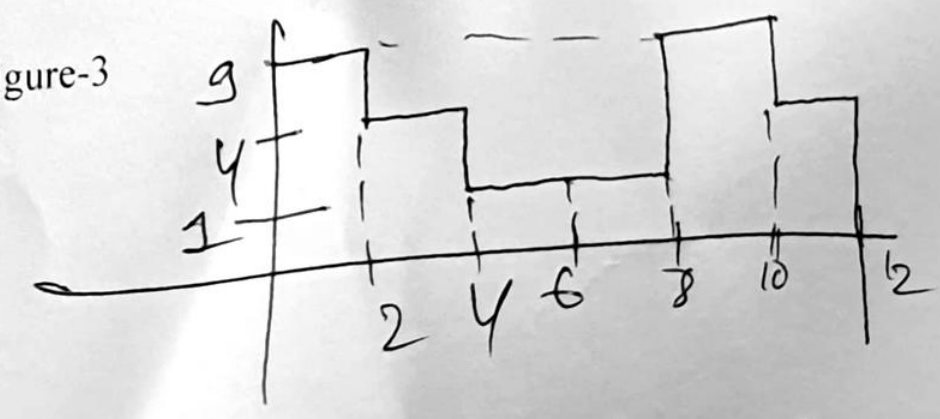


Figure-3



4. A series R-L-C circuit is designed to resonant at $\omega_s = 10^5\ rad/s$, have a bandwidth of $0.15\omega_s$, and draw 15 W from a 120 V source at resonance.
   a. Determine the value of R. [5]
   b. Find the bandwidth in hertz.
   c. Find the values of L and C.
   d. Determine the Q_s of the circuit.

5. For the Δ-Y connected load in figure-4.
   a. Find the magnitudes of phase voltage and phase current. [5]
   b. Find the total reactive power.
   c. Find the total Apparent power.
   d. Find the total average power.

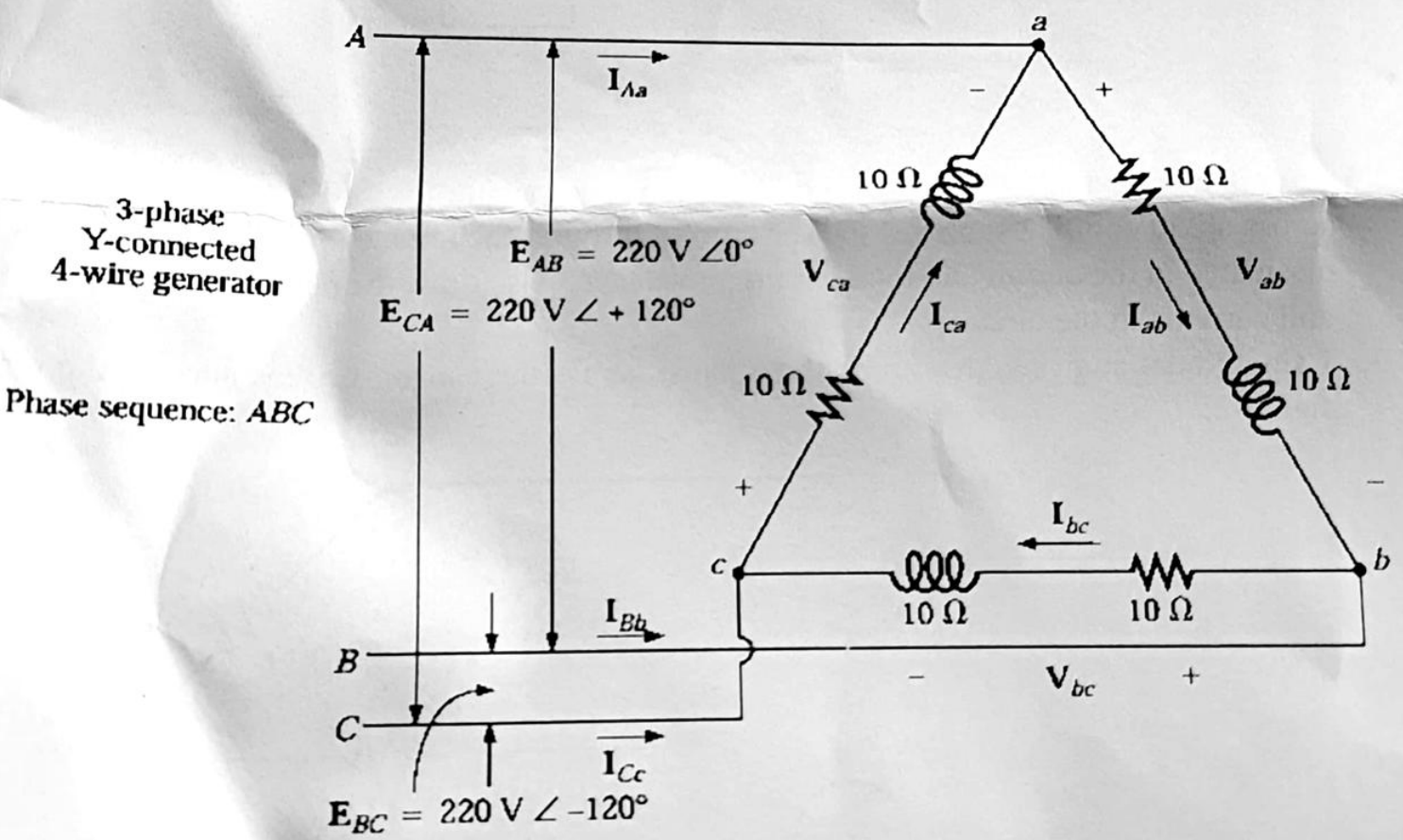


Figure-4