Dr. Shruti Jain (ECE)

COURSE CODE: 10B11EC111   MAX. MARKS: 50
COURSE NAME: Electrical Circuit Analysis   MAX.TIME: 2 HRS
COURSE CREDITS: 4

Q1. a) Define Form factor and peak factor.   (2)

b) What is the average power across resistor, inductor and capacitor?   (2)

c) If phase difference between resistor and inductor is 90^0 then what is the power factor and its significance?   (2)

d) Draw the current, voltage and power waveform of pure capacitive circuit. (2)

Q2. a) Define and derive Maximum Power theorem.   (6)

b) Use superposition theorem to find the average power absorbed by the 5-Ω resistor in the circuit shown in Fig.   (6)
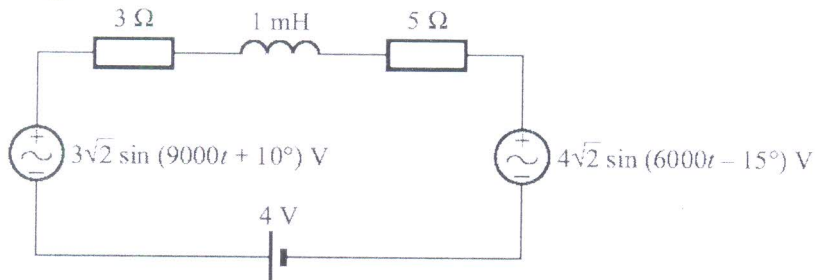
Q3. A) Draw the phasor diagram of R, L, C, and RL circuits .   (4)

a) In an ac circuit, the instantaneous voltage and current are given as   (6)

$v = 55 \sin \omega t$ V   and $i = 6.1 \sin(\omega t - \pi/5)$ A

Determine the following : average power, the apparent power, the instantaneous power when ωt (in radians) equals 0.3, and the power factor

Q4. a) What is series resonance? Illustrate the variation of Z and I in resonance by graphs. (4)

b) A series RLC circuit consists of $R = 1$ Ω, $L = 140$ mH and $C = 100$ μF and voltage applied is 220 V at 50 Hz. Determine the frequency at which resonance occurs, the current and voltage across R, L and C.   (6)

Q5. a) What are two port networks? Explain z-parameters.   (6)

b) A series RL circuit, having $R = 4$ Ω and $L = 0.2$ H, is connected across $230\angle30°$ V, 50-Hz supply. Calculate (*a*) the current drawn by the circuit, and (*b*) the power factor of the circuit. (4)