



Given  $R = 100 \Omega$ ,  $C = 2 \mu\text{F}$ ,  $L = 80 \text{ m H}$ ,  $V_s = 10 \cos(1256.637 t)$ , determine values of the following variables at AC steady state:

- Q1. Magnitude of  $V_s$  in Vp (peak voltage),
- Q2. Frequency of  $V_s$  in Hz,
- Q3. Phase of  $V_s$  in radian within range  $(-\pi, \pi]$ .
- Q4. Phasor  $V_s$  in rectangular form (if it is a complex, write in  $a + j b$  format---there is a space between j and the imaginary number),
- Q5. Impedance of resistor  $R$  in ohm,
- Q6. Impedance of capacitor  $C$  in ohm (if it is a complex, write in  $a + j b$  format---there is a space between j and the imaginary number),
- Q7. Impedance of inductor  $L$  in ohm (if it is a complex, write in  $a + j b$  format---there is a space between j and the imaginary number),
- Q8. Magnitude of current  $i_R$  in Ap (peak ampere)
- Q9. Frequency of current  $i_R$  in Hz,
- Q10. Phase of current  $i_R$  (with reference to the phase of voltage  $V_s$ ) in radian within range  $(-\pi, \pi]$ .

*Hint: convert  $V_s$  to phasor and use phasor analysis.*

Write your answers in the following format.

Q1.1. magp\_vs = 0 V  
 Q1.2. freq\_vs = 0 Hz  
 Q1.3. phase\_vs = 0 rad  
 Q1.4. rec\_phasor\_vs = 0 V  
 Q1.5. ZR = 0 ohm  
 Q1.6. ZC = 0 ohm  
 Q1.7. ZL = 0 ohm  
 Q1.8. magp\_ir = 0 A  
 Q1.9. freq\_ir = 0 Hz  
 Q1.10. phase\_ir = 0 rad