**Answer all questions.**

**Q1:**
1/ why passive filters are called passive?
2/ Define LPF and HPF
3/ what do we mean by Brickwall diagram? Give an example.
4/ write the Polar form of $Z = (9 - j5)$ impedance, and draw the Phaser diagram.
5/ show that the form factor of a periodic wave is equal to 1.111

**Q2:**
You have a series RC electronic circuit with: 
- $V_s = 340 \text{ v Peak}$ , $C = 250 \mu F$ , $R = 20 \Omega$
Find the current and Voltages across $R$ and $C$, and draw the circuit and its phaser Diagram to show the phase angles.

**Q3:**
Show that Power in Inductance $L$ is: $P_L = -0.5V_m I_m \sin 2\omega t$.
Write the equation for the power in a Capacitance, and state the difference between the power across $L$ and $C$.
Draw the waveforms of the power for $L \& C$ compared with their voltages.

**Q4:**
For a series RLC circuit if:
- $V_s = 120 \text{ v}$ , $R = 50 \Omega$ , $C = 50 \text{nF}$
Find:
- $f_0$ , $Q$ , $f_1$ , $f_2$ .

**Q5:**
For the RC network the amplitude response $A_v = 1/[(\omega/\omega_c)^2 + 1]^{1/2}$
Find:
- i) $A_{dB}$
- ii) $A_{dB}$ if $\omega >> \omega_c$
- iii) $A_{dB}$ if $\omega = \omega_c$
- iv) $\Phi$ (phase response)
- v) if $R = 100 \Omega$ , $\omega_c = 5k \text{ rad/sec}$ find:
  - The capacitor value, and $\tau$, and $A_{dB}$ if $\omega = 100\omega_c$

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