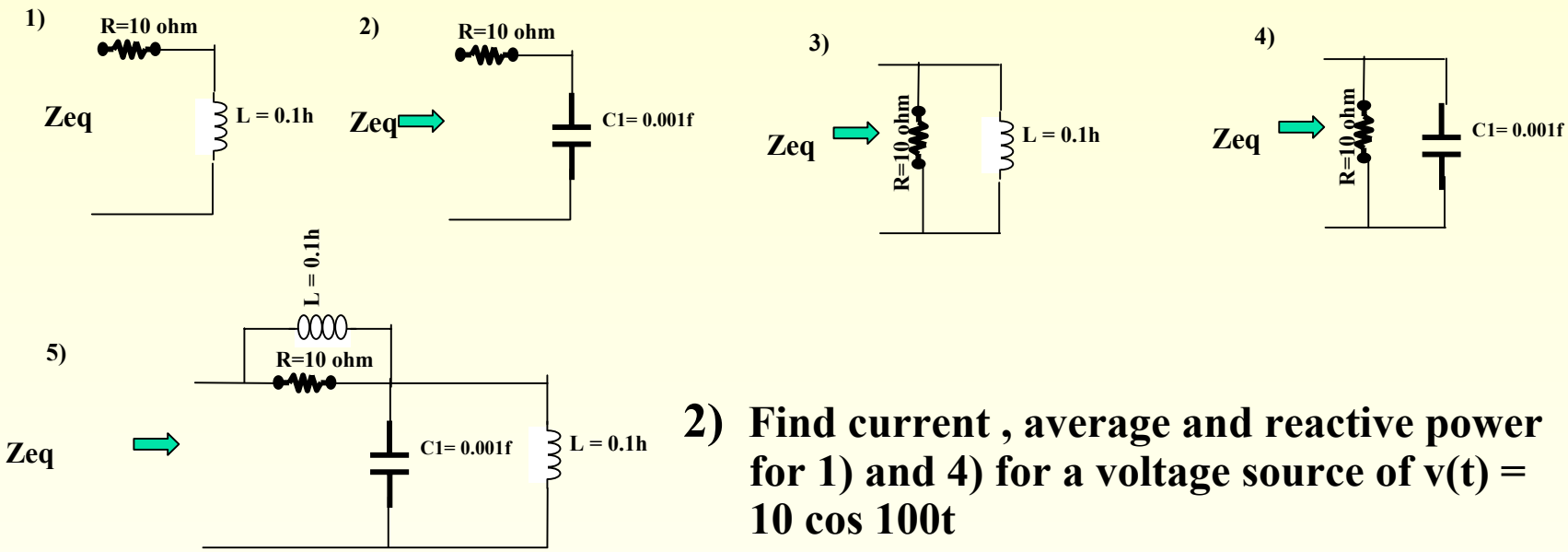
Quiz 5

1) Calculate the equivalent impedance and express it in complex and polar forms for a input frequency of ω=100 :



2) Find current , average and reactive power for 1) and 4) for a voltage source of v(t) = 10 cos 100t

Quiz 5 Answers

1)

$$1)\,Zeq = 10 + j10, 10\sqrt{2\angle 45}$$

$$2)\,Zeq = 10 - j/100 * .001 = 10 - j10, 10\sqrt{2}\angle -45$$

$$3)\,Zeq = j100/(10 + j10) = j100(10 - j10)/200 = 5 + j5$$

$$\sqrt{50}\angle 45$$

$$4)\,Zeq = j10/(j - 1) = 5 - j5, \sqrt{50}\angle -45$$

$$5)\,Zeq = (5 + j5) + (5 - j5) = 10, 10\angle 0$$

2)

Average Power = Vm*Im (cosθ)/2
Reactive Power= vm *Im (sinθ)/2

1) **3.53 *(cos 45) = 2.5ω active power**
3.53 *(sin 45) = 2.5w reactive power

7.07 (cos –45) = 5 w active power
7.07(sin –45) = 5w capacitive reactive power