1. If the current in a 1μf capacitor is to be 0.1 ma, at what rate in volts per second must the applied voltage change $\frac{dv}{dt} = 100v/s$

2. The magnetic flux through a 500-turn winding varied according to Φ = 0.004t webers. Find the induced voltage in the winding (a) when t = 0.01 second and (b) when t = 0.1 second. $vind = -2v$

3. If the flux through a 150-turn winding varied according to the formula Φ = 0.01t - t 2 + 0.2 webers, what voltage was induced when t = 0.02 second?
   $vind = 4.5v$

4. The magnetic flux N in a winding of 600 turns varied as Φ = 0.5t 3/5 webers, where t was in seconds. Find the induced voltage vind when t = 1 second. $vind = -180v$

5. What formula expresses the voltage vind across a 100 mh inductor if the current i constantly equals 0.2 A? Neglect resistance. $vind = 0v$

6. How fast does the current in a 12 h winding change to cause an induced voltage of 3.6 v? $\frac{di}{dt} = -300mA/s$

7. The mutual inductance between two windings is 0.2 henry. If a current i1 = 11t 3/2 amps flows in one of the windings, how much voltage v2 is induced in the second winding when t = 0.001 second? $v_2 = -104.355mv$

8. The mutual inductance between two windings is M = 6 h. How fast must the current in one of the windings vary in amps per second to induce -4.8 volts in the other winding? $\frac{di}{dt} = 800mA/s$

9. A winding linked a magnetic field that varied according to ϕ = 0.002t - 2t 2 webers. When t was 0.0025 second, the voltage induced in the winding measured 8 volts. How many turns did the winding include?
   $n = 1000\ turns$

10. If the current in a 30 h inductor changes according to i = 0.02t 5/3 amps, after what interval will the induced voltage measure -96 volts?

$$t = 940.604\ s$$

11. A voltage v = t3 + 1,000 volts appears across a parallel RC combination, where R = 300 kΩ and C = 20 µf. Find the resulting current ig at any time t.

$$ig = 3.333 \times 10^{-6}t^3 + 60 \times 10^{-6}t^2 + 3.333 \times 10^{-3}$$

12. A 50 kΩ bleeder resistor shunts a 4 µf filter capacitor. During a part of the charging process, the voltage across the capacitor varies approximately as vc = 1,000t 2/3 + 100 volts. Find the current ig applied to the combination when t = 0.001 second. $ig = 28.867mA$

13. A current i = 3t 1/3 + 2 amps flows through a series RL circuit, where R = 100Ω and L = 20 h. Find the voltage vg across this circuit when t = 0.125 second. $vg = 270v$

14. A relay winding has an inductance of 0.5 h and a resistance of 470Ω. If the winding current i equals t 1/2 + 0.02 amps, find the voltage vg across the winding when t = 0.01 seconds. $vg = 53.9v$