Fields and Waves
Tutorial-1 12th January, 2016

1. Assume that **r** is the position vector of the point **(x, y, z)** and **A** is a constant vector. Then define the equations for the following
   (a) (r - A) • A = 0
   (b) (r - A) • r = 0
2. $\boldsymbol{A = cos(10^8 t - 10x + 60^0)}$$a_z$ and $\boldsymbol{B = \frac{20}{ja_x} + 10e^{j\frac{2\pi x}{3}} a_y}$. Express A in phasor form and B in instantaneous form.
3. $\boldsymbol{A = -25sin(4.71X10^8 t + 1.57x)}$, $\boldsymbol{B = -50cos(-9.42X10^8 t + 3.14x)}$.

Find the direction of propagation of the waves, wavelength, speed, frequency, wave number for both **A and B** waves

Home Assignment to be submitted and discussed during tutorial session.

1. For the circuit shown **in Fig. 1 R= 40ohms, C= 150uf** and it is driven by periodic pulse **V(t)** alternating between 15V to 0V with T=0.3sec . **Voltage across capacitor is Vc(t) and resistor is Vr(t)**.

a) **Find Vc(t) and the current I(t) flowing in the circuit for 0<t<T**.
b) **Sketch Vc(t) and Vr(t) for 0<t<2T.**

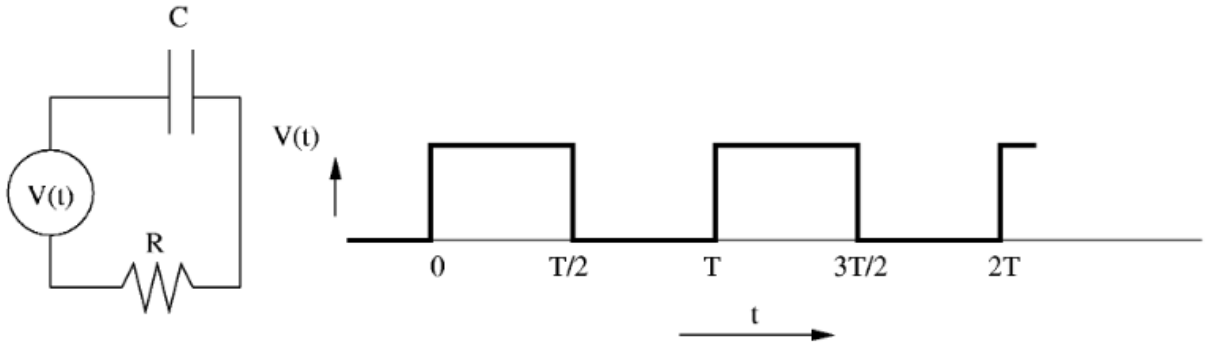

Figure 1