SCS 139 Dr.Prapun: Problem Set 4

Due date: None

1. A current through an element in a circuit can be described by
$$i(t) = 8\cos\left(500\pi t - 25^\circ\right) \text{ A}$$
   a. What is the amplitude of the current?
   b. What is its angular frequency?
   c. Find the frequency of the current.
   d. Calculate i_s at t = 2 ms.
   Hint: None of these are correct: 7.25, 7.93, 6.939, -4.405, -7.93, -3.622, 7.425

2. Express the following signals in their standard forms.
   a. v(t) = 21 cos(4t-15^o) V
   b. i(t) = -8 sin(10t+70^o) mA
   c. v(t) = 120 sin (10t –50^o) V
   d. i(t) = -60cos(30t +10^o) mA

3. [HRW, 9E, P33.1] A certain helium–neon laser emits red light in a narrow band of wavelengths centered at 632.8 nm and with a "wavelength width" of 0.0100 nm. What is the corresponding "frequency width" for the emission?

4. [HRW, 9E, P33.12] In a plane radio wave the maximum value of the electric field component is 5.00 V/m. Calculate the maximum value of the magnetic field component.