SHEET 7
Sinusoidal Alternating Voltage and Current

1. Determine the periodic time for the following frequencies: (a) 2.5 Hz (b)100 Hz (c) 40 kHz.

2. Calculate the frequency for the following periodic times: (a) 5 ms (b) 50µs (c) 0.2 s.

3. What are the phase relation between the following waveforms?
   (a) v= 8 sin(20t+30°)V, i= 6 sin(20t- 25°)A
   (b) v= 8 sin(20πt+30°)V, i= 6 cos(20πt- 35°)A
   (c) v1=-11 sin(377t-45°)V, v2= 23 cos(377t+ 37°)V
   (d) i1=-3.6 sin(754t+15°)A, i2= -7.8 cos(754t- 35°)A
   (e) v= -7.6 sin(22t-13°)V, i= 4.3 cos(11t+ 22°)A

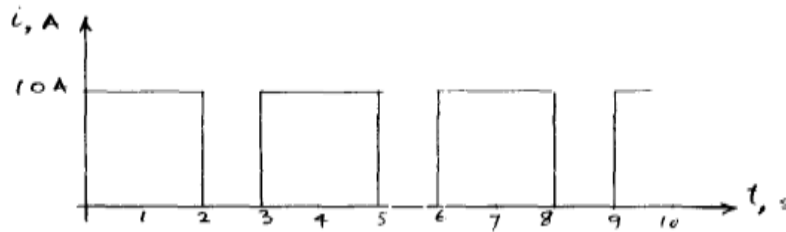4. Determine the rms value and the average value of the current waveform shown in the fig.1

Fig.1

5. An inductor draws 5A of current at 110V,60Hz. (a) Express the instantaneous voltage and current mathematically. (b) determine the inductive reactance and the inductance of the inductor.

6. An inductor draws 5A of current at 120V,50Hz. (a) Express the instantaneous voltage and current mathematically. (b) determine the capacitive reactance and the capacitance of the capacitor.

7. The voltage across a 0.5 H inductor is v= 200sin 100t V. (a) what is the instantaneous current? (b) the average power (c)voltage and current effective values (d) the instantaneous power?

End of sheet 7