Exercise 1 MBS2005X Electrical Knowledge

1. Draw the phasor diagram for the following:

(a) $i_1 = 3\sin(\omega t + 60°)A$

(b) $i_2 = \sqrt{2}\sin(\omega t - \frac{\pi}{4})A$

(c) $i_3 = -10\sin(\omega t + 120°)A$

2. The instantaneous values of the two voltages are expressed by v1 = 60sinθ V and v2 = 40sin(θ-π/3) V, by using phasor method, to find out

(a) the sum of the two voltages; and

(b)the difference of the two voltages

((a) and (b) should be expressed in sine equation.)

3. The instantaneous voltage: v = 282 sin (3140t – π/2) V

(a) To find (i) Frequency f;

(ii) Period T;

(iii) Angular velocity ω;

(iv) Effective value $V_{r.m.s}$;

(v) Phase angle ψ; and

(vi) Draw the waveform and phasor diagram for the voltage

(b) What is the instantaneous value of the voltage when t = 0.2s ?

(c) If a pure resistor R = 15 ohm is added to this voltage, what is instantaneous current?