Department of ECE, Bennett University

EECE105L: Fundamentals of Electrical and Electronics Engineering

Tutorial Sheet-8

1. Consider the signals given in (a) - (g). In each case, two waves $f(t)$ and $g(t)$ are described by corresponding equations. From the wave equations, find which wave leads and which wave lags. Also find the angle of leading/lagging.

$$f(t)=10\sin\left(\omega t+30^0\right)$$
$$g(t)=10\sin\left(\omega t+40^0\right)$$ (a)

$$f(t)=10\sin\left(\omega t+20^0\right)$$
$$g(t)=10\sin\left(\omega t-80^0\right)$$ (b)

$$f(t)=10\sin\left(\omega t-20^0\right)$$
$$g(t)=10\cos\left(\omega t+80^0\right)$$ (c)

$$f(t)=-10\sin\left(\omega t+20^0\right)$$
$$g(t)=10\sin\left(\omega t-80^0\right)$$ (d)

$$f(t)=10\sin\left(\omega t-20^0\right)$$
$$g(t)=-10\sin\left(\omega t+80^0\right)$$ (e)

$$f(t)=-A\sin\left(\omega t+\theta\right)$$
$$g(t)=B\cos\left(\omega t-\phi\right)$$ (f)

$$f(t)=A\sin\left(\omega t+\theta\right)$$
$$g(t)=B\sin\left(\omega t+\phi\right)$$ (g)

2. Consider the wave form shown in fig. 1 through fig. 4. Answer the following questions.
   a. Peak value, peak amplitude, peak to peak value
   b. Average value and RMS over one period
   c. Average value and RMS over half period
   d. Relation between RMS value and peak value.

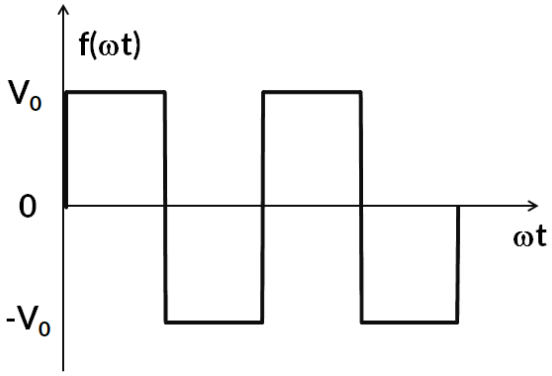

Fig. 1

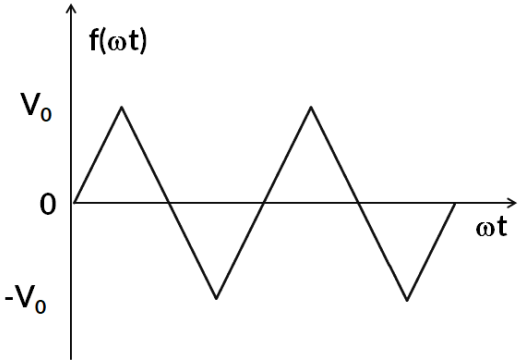

Fig. 2

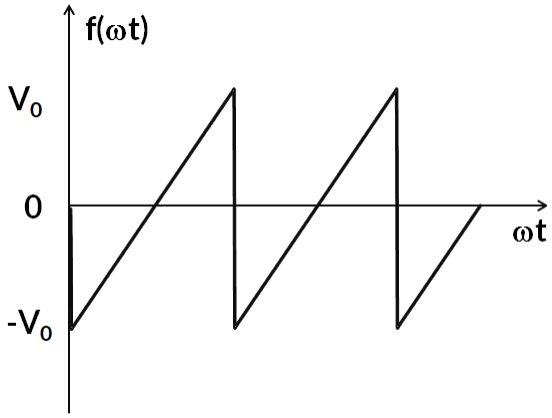

Fig. 3

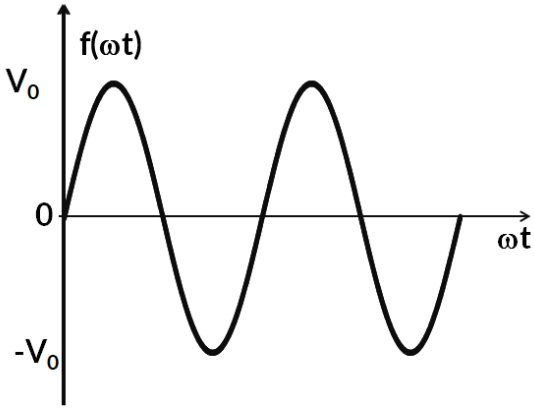

Fig. 4

3. Consider the signals shown in fig. 5 through fig. 8. Evaluate
   a. Peak value, peak amplitude, peak to peak value
   b. Over one period, find average value and RMS value

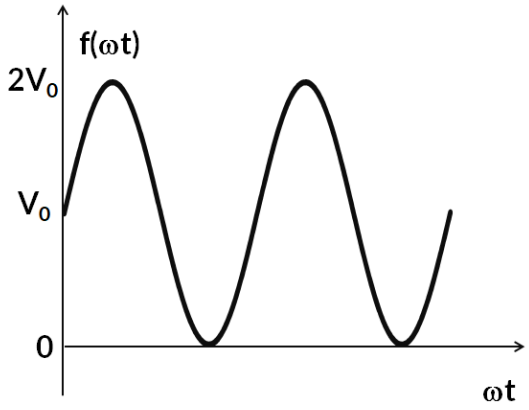

Fig. 5

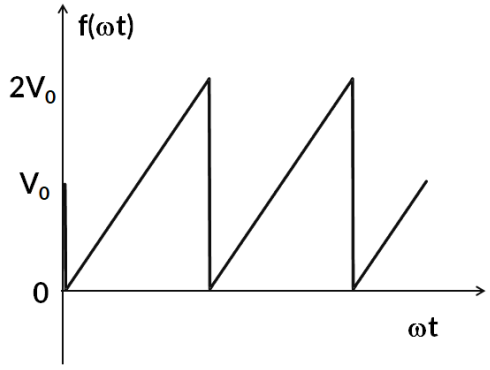

Fig. 6

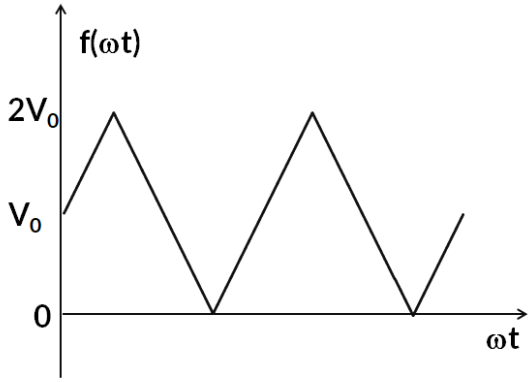

Fig. 7

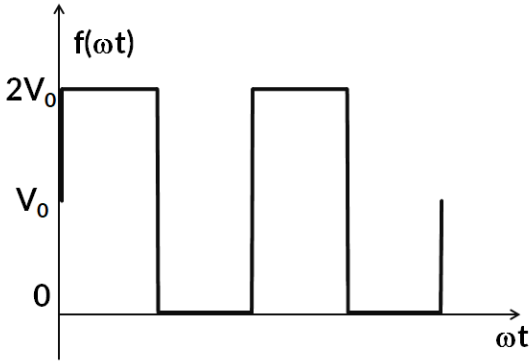

Fig. 8

4. For the waveforms shown in fig. 9 and 10. Evaluate
   a. Peak value, peak amplitude, peak to peak value
   b. Over one period, find average value and RMS value

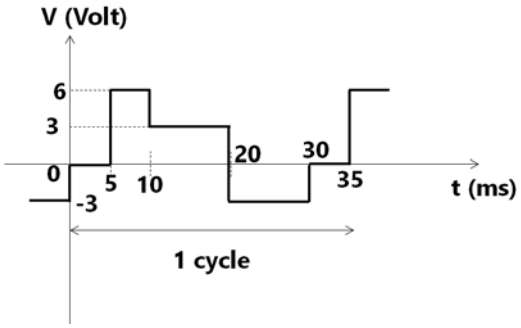

Fig. 9

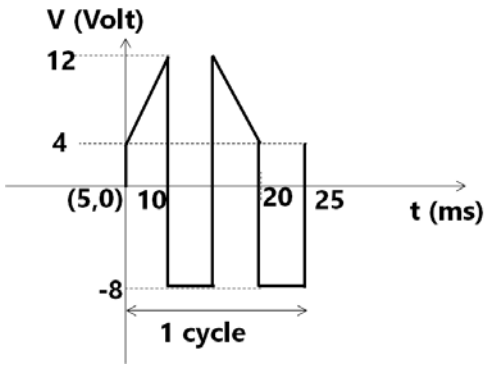

Fig. 10

---------- END OF QUESTIONS ----------

Answers:

Question 1: No answers are provided, as answer is the complete solution.

Question 2:

a. Peak value, peak amplitude both are equal in all the cases and is V_0. Peak to peak value is $2V_0$.
b. Average value over one period is zero.

Question 3:

a. Peak value is $2V_0$, peak amplitude is V_0. Peak to peak value is $2V_0$.
b.