Lecture 20

2. A sinusoidal wave of frequency 50Hz has its maximum value of 9.2A. what will be its value at

   i)   **0.002sec after passing through zero in positive direction.**

   ii)   **0.0045sec after the wave passes through positive maximum. Sketch the waveform of current showing the current value at the above time instants.**
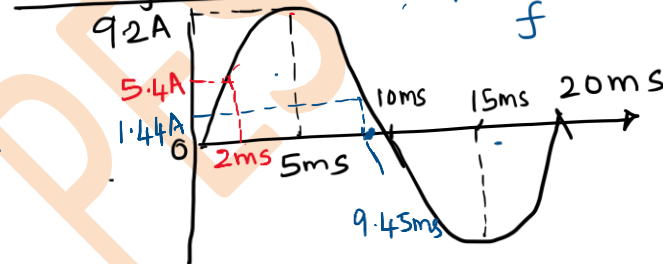
<u>Solution</u>   Given $f = 50Hz$, $I_m = 9.2A$, $\omega = 2\pi f$

$$i(t) = I_m \sin\omega t = 9.2 \sin(100\pi t)$$

i) $i_{at}(0.002 \sec) = 9.2 \sin\left(100\pi \times 0.002 \times \dfrac{180}{\pi}\right)$

$$= 9.2 \sin 36$$
$$= 5.4A$$

ii) $i_{at}(0.0045 \sec) = 9.2 \sin\left(100\pi t + \pi/2\right)\dfrac{180}{\pi}$

$$= 9.2 \sin 171$$
$$= 1.44A$$

<u>Wave form</u>

$T = \dfrac{1}{f} = 20ms$

After passing thro max^m value total time t will be

$t = 5ms + 4.5ms$

$= 9.5 ms$

At $t = 9.5ms$, $i = 1.44A$