

Table 4-1: The relationship between peak and rms values

	rms voltage, V		peak voltage, V		rms current, mA	
	Measured	Calculated	Measured	Calculated	Measured	Calculated
Sine wave generator output	4.946V		7V			
R1 = 3.3kΩ	1.463V	1.5V	2.2V	2.1V	0.45mA	0.5mA
R2 = 4.6kΩ	2.040V	2V	2.8V	2.9V	0.43mA	0.45mA
R3 = 3.96kΩ	1.448V	1.5V	2V	2V	0.42mA	0.4mA

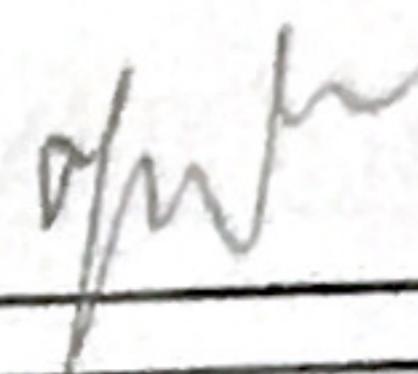
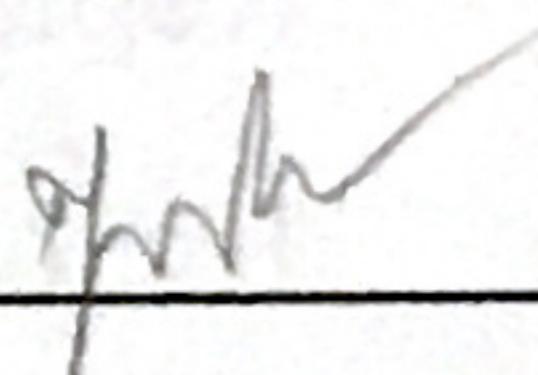
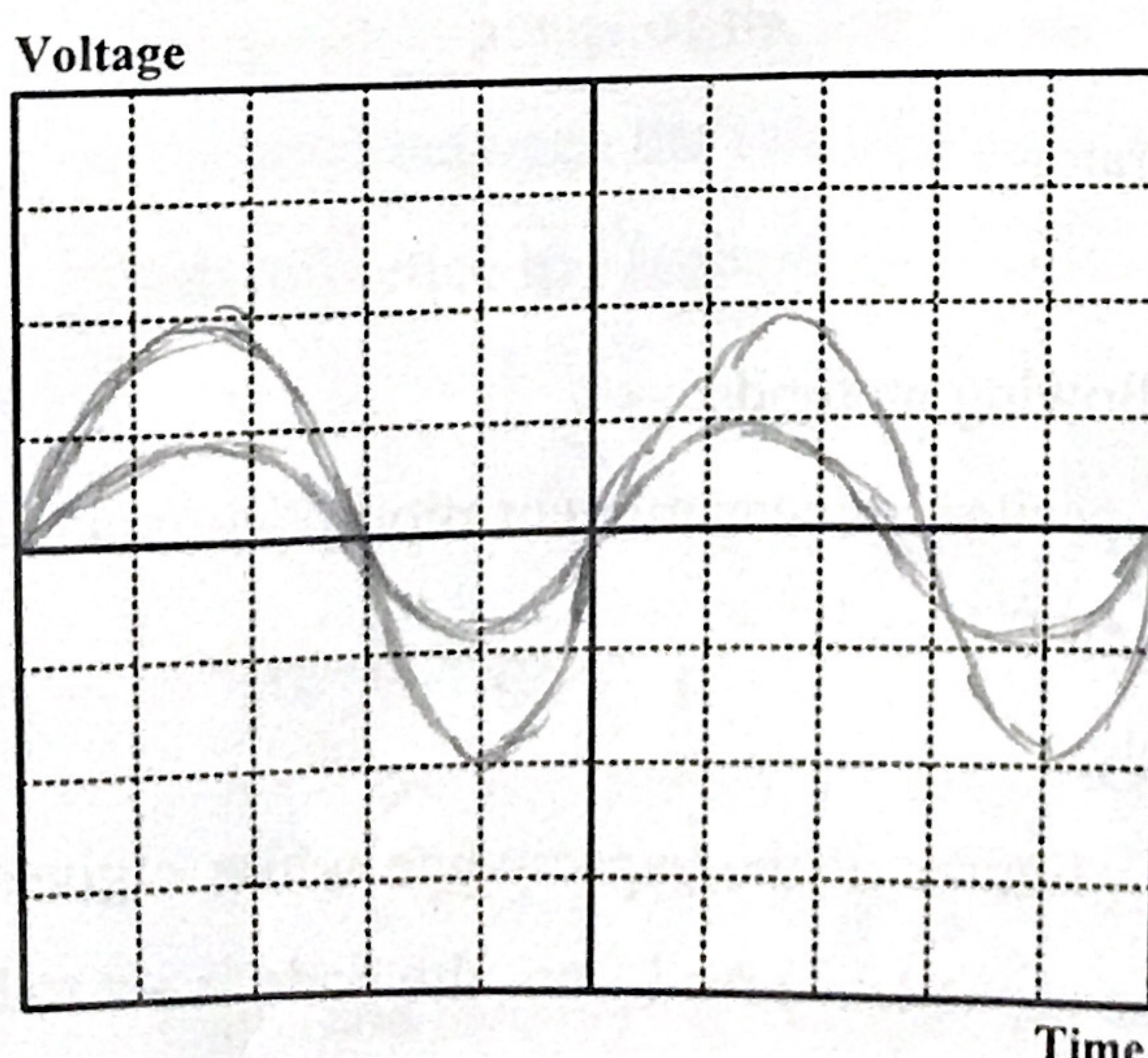
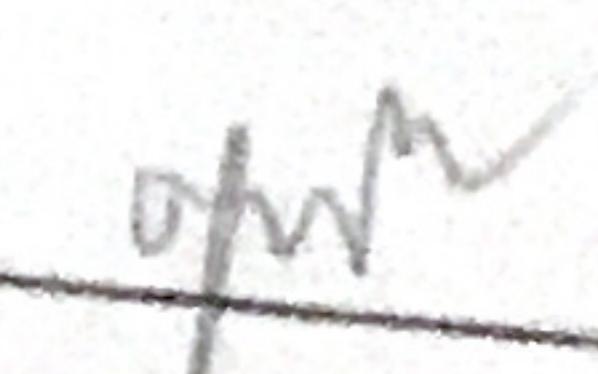
TA Signature: 

Table 4-2: Frequency measurement

Frequency of wave (Hz) (Setting value)	Width of one cycle (div.)	Time-base setting (time units/div.)	Period of wave T (sec.)	Calculated frequency of wave f (Hz)
1.5kHz	3.4	0.2 ms	0.68 sec	1.47kHz

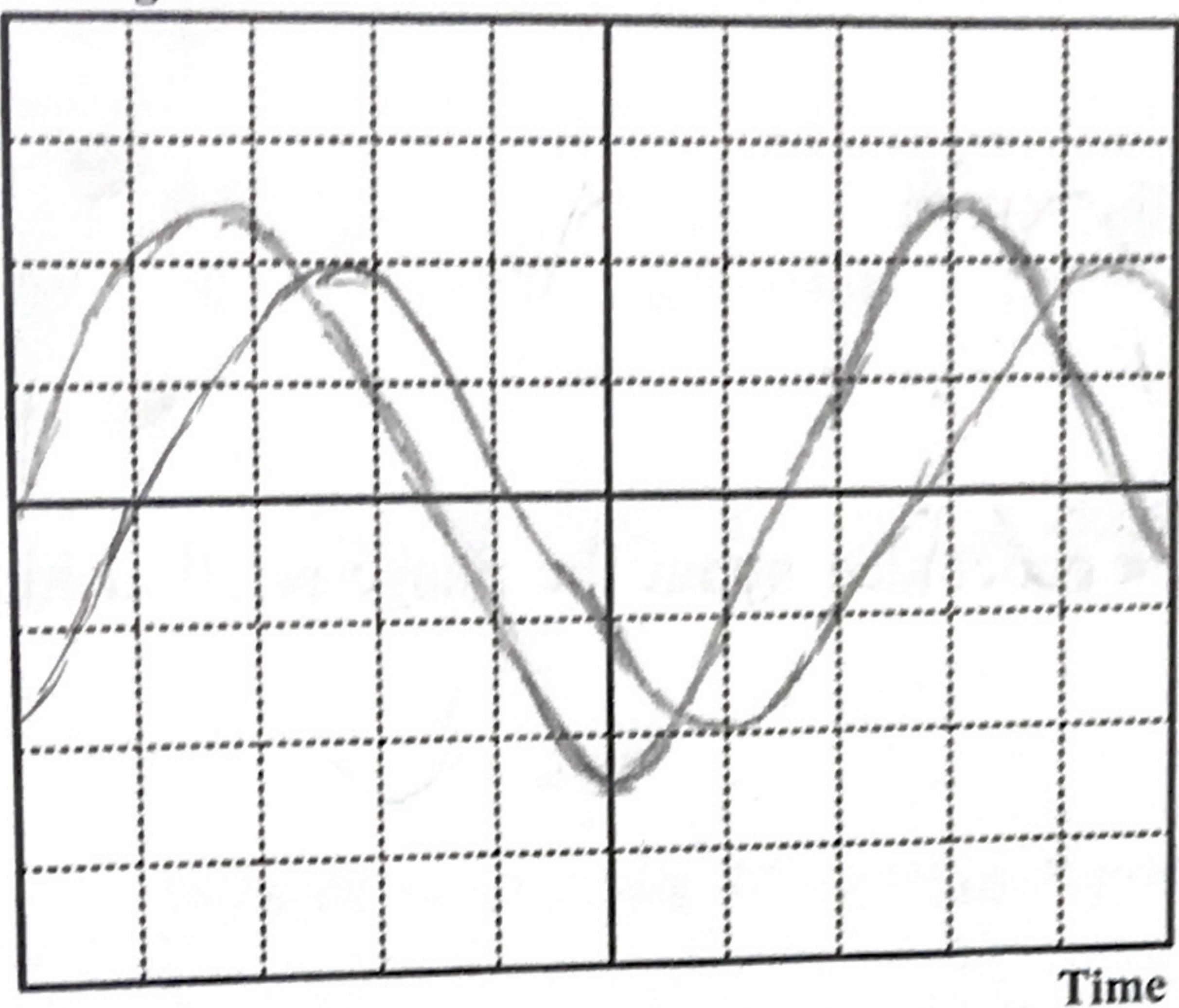
TA Signature: 

Graph 4-1: Phase relationship in a resistive circuit

Channel 1: volts/div = 2Channel 2: volts/div = 0.5Time/div = 0.1Distance D from 0° to 360° for the voltage sine wave,  $v = \frac{5}{5}$  divisions.Horizontal distance d between maximum points of  $v$  and  $i = \frac{0}{5}$  divisions.Phase angle  $\theta = (360/D)d = \frac{0}{5}$  degrees. $v$  leads  $i$  by 0 degrees. Power factor  $\cos \theta = \frac{1}{1}$ .Average power delivered by the generator = 15.3 milli watts.TA Signature: 

### Graph 4-2: Phase relationship in an inductive circuit

Voltage



Channel 1: volts/div = 1 V

Channel 2: volts/div = 0.5 V

Time/div = 0.1 ms

$22.88 \text{ mH}$

Distance D from  $0^\circ$  to  $360^\circ$  for the voltage sine wave,  $v = \underline{5}$  divisions.

Horizontal distance d between maximum points of  $v$  and  $i = \underline{1}$  divisions.

Phase angle  $\theta = (360/D)(d) = \underline{72}$  degrees.

$v$  leads  $i$  by 72 degrees. Power factor  $\cos \theta = \underline{0.309}$ .

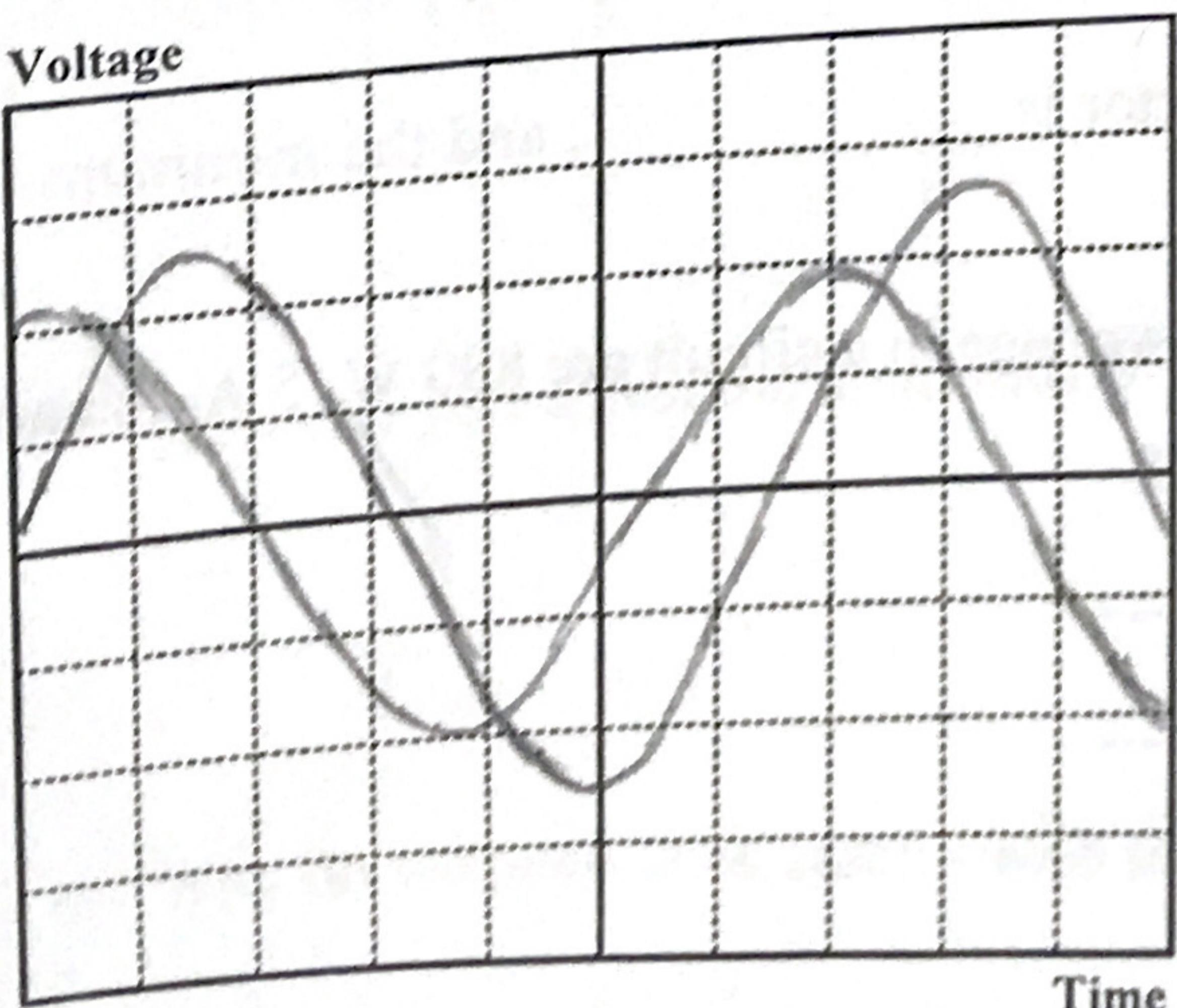
Average power delivered by the generator 3.59 m watts.

TA Signature: Rajha

### Graph 4-3: Phase relationship in a capacitive circuit.

$0.49 \mu\text{F}$

Voltage



Channel 1: volts/div = 1 V

Channel 2: volts/div = 0.5 V

Time/div = 0.1 ms

Distance D from  $0^\circ$  to  $360^\circ$  for the voltage sine wave,  $v = \underline{5}$  divisions.

Horizontal distance d between maximum points of  $v$  and  $i = \underline{1}$  divisions.

Phase angle  $\theta = (360/D)(d) = \underline{71}$  degrees.

$v$  leads  $i$  by -71 degrees. Power factor  $\cos \theta = \underline{0.309}$ .

Average power delivered by the generator 4.41 m watts.

TA Signature: Rajha