

EASTERN MEDITERRANEAN UNIVERSITY

DEPARTMENT OF ELECTRICAL AND ELECTRONIC
ENGINEERING

EENG223

CIRCUIT THEORY I

EXPERIMENT 9

TIME CONSTANT

Student Name & Student Number

1.....

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Object: To investigate the factors determining the charge and discharge times for a capacitor and resistor circuit.

- Construct the circuit in Fig. 9.1 and set the slide switch initially to the right.

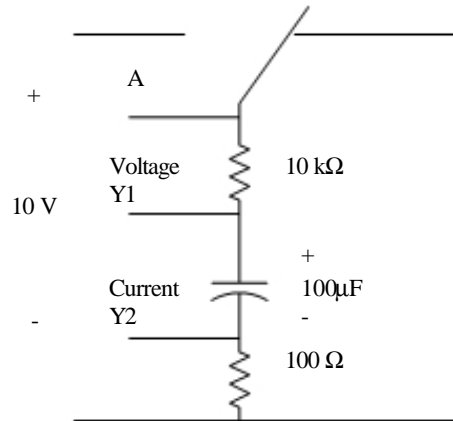


Fig. 9.1.

- Switch the slide switch to the left and observe the current and voltage charging waveforms on the oscilloscope. Draw this waveform to Fig. 9.2. Switch the slide switch to the right and observe the discharge current and voltage waveforms. Draw the waveforms to Fig. 9.3.

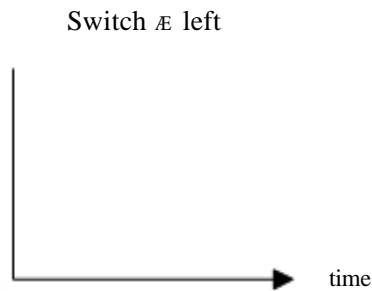


Fig. 9.2

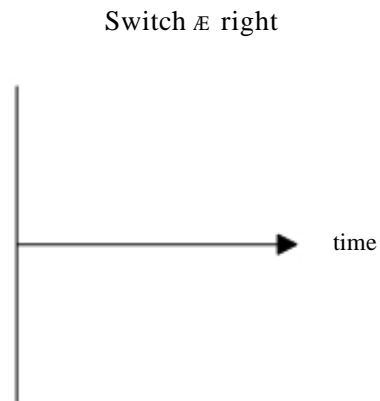


Fig. 9.3

- Now disconnect Y1 from the voltage monitoring point and connect it to point A. The oscilloscope is now looking at the voltage applied to the series capacitor-resistor (CR) circuit. Operate the switch left and right regularly and observe the Y1 waveform. Draw what you see on the oscilloscope in Fig. 9.4.



Fig. 9.4

- Construct the circuit in Fig. 9.5 and set the generator so that the output square wave has a frequency of 1 Hz, at an output level of 10 V_{pk-pk}. Connect the oscilloscope Y1 input initially to point A. Find the period from the oscilloscope. Then set the frequency to 2 Hz, and find the period again.

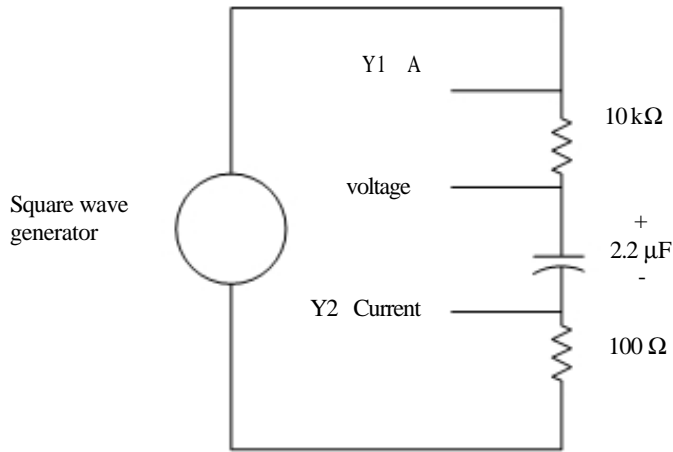


Fig. 9.5.

- Disconnect the Y1 input from point A and reconnect it to monitor the voltage across the capacitor. The Y1 curve shows the voltage charge and discharge curves one after the other. The Y2 channel curve gives the current charge and discharge. Draw these curves on the axes indicated below to Fig. 9.6.

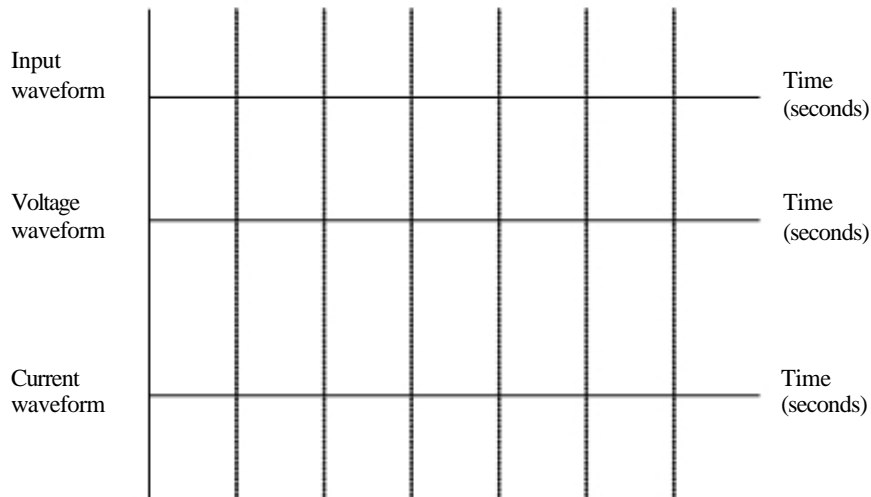


Fig. 9.6.

