

EASTERN MEDITERRANEAN UNIVERSITY

DEPARTMENT OF ELECTRICAL AND ELECTRONIC
ENGINEERING

EENG223

CIRCUIT THEORY I

EXPERIMENT 8

CAPACITANCE

Student Name & Student Number

1.....

2.....

3.....

Object: To explore the idea of the capacitance of a component. •

Construct the circuit in Fig. 8.1.

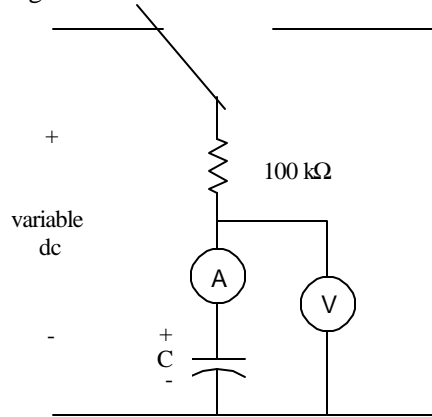


Fig. 8.1.

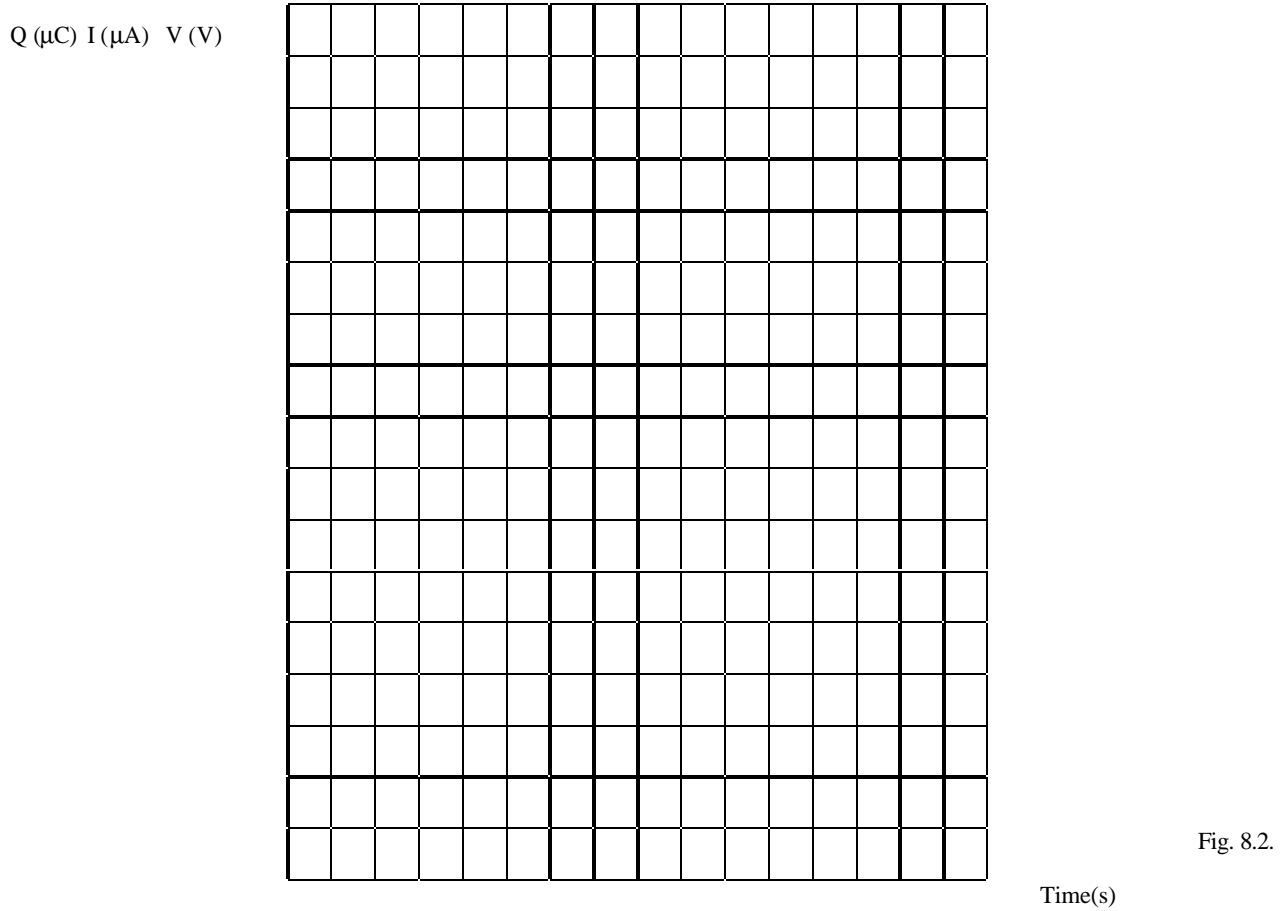
- Disconnect the connection to C.
- Switch the slide switch to the left.
- Apply voltage to the circuit until you read 10 V reading on the voltmeter.
- Switch the slide switch to the right and check that voltmeter returns to zero.
- Connect C to the circuit.
- Switch the slide switch to the left.
- Take the readings as shown in Table 8.1.

Table 8.1

Time (s)	Current (μA)	Voltage on C (V)
0		
5		
10		
20		
30		
40		
50		
60		
70		
80		
90		
100		

Questions:

1. Plot graphs of voltage and current against time. Plot them on the same piece of graph paper with axes as shown in Fig. 8.2.



2. Are the curves you obtained of the shape you expected?
3. What was the maximum value of current recorded ?
4. At the time of the current maximum, what was the voltage across the capacitor ?
5. What was the voltage across the resistor at this time ?

6. What limits the magnitude of the initial maximum current ?
7. To estimate the area under the curve already plotted, count the squares in the graph paper under the curve. Fill Table 8.2 .
8. Draw a graph of charge against time on Fig. 8.2. With current in μA and time in second, the charge will be in μC .
9. From your graphs, complete Table 8.3 relating the charge on the component C.

Table 8.2

Time (s)	Squares (numbers)	Charge (μC)
0		
5		
10		
20		
30		
40		
50		
60		
70		
80		
90		
100		

Table 8.3

Voltage (V)	Charge (μC)

10. Do you notice any relationship between the voltage and the charge?

11. Plot a graph of charge (Q) against V to Fig. 8.3.

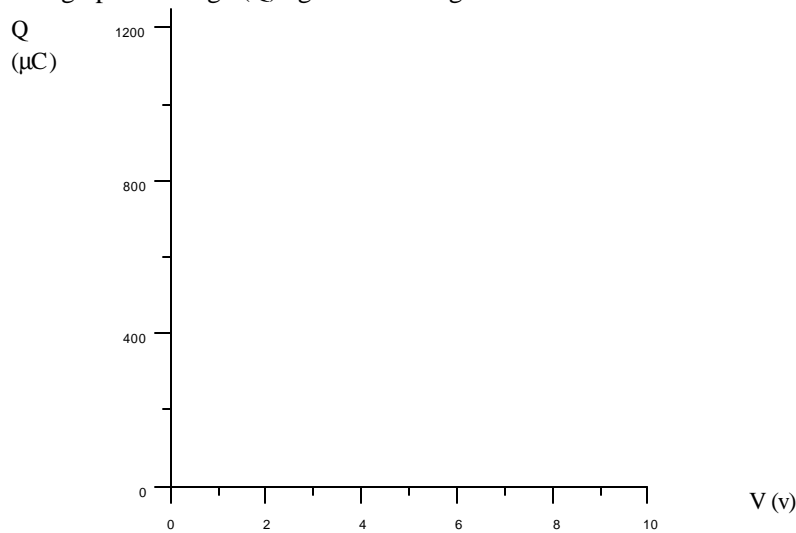


Fig. 8.3

12. What was the value of capacitance of component C, as found from the graph?