

PRAYAS

JEE 2025

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Lecture - 02

Physics

H.W Discussion (Capacitor)
(16 ques)

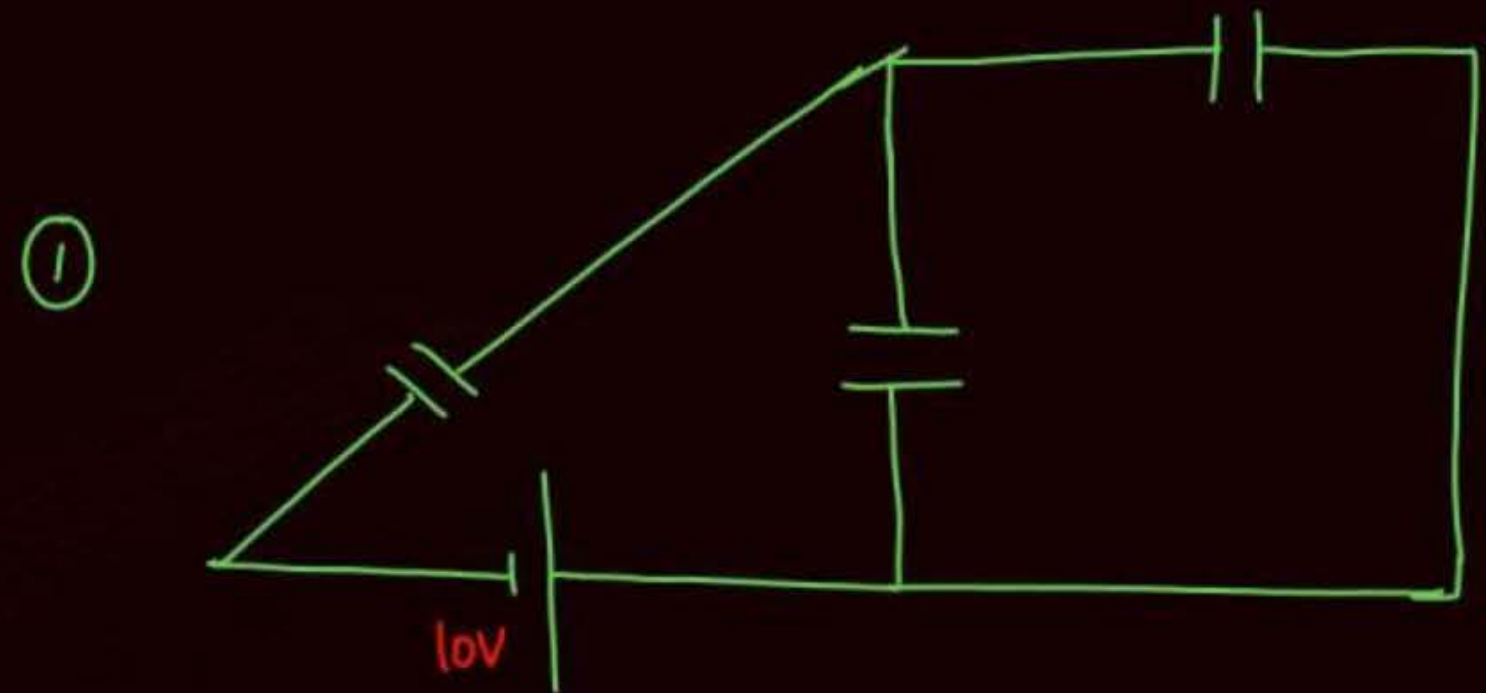
By- Saleem Ahmed Sir





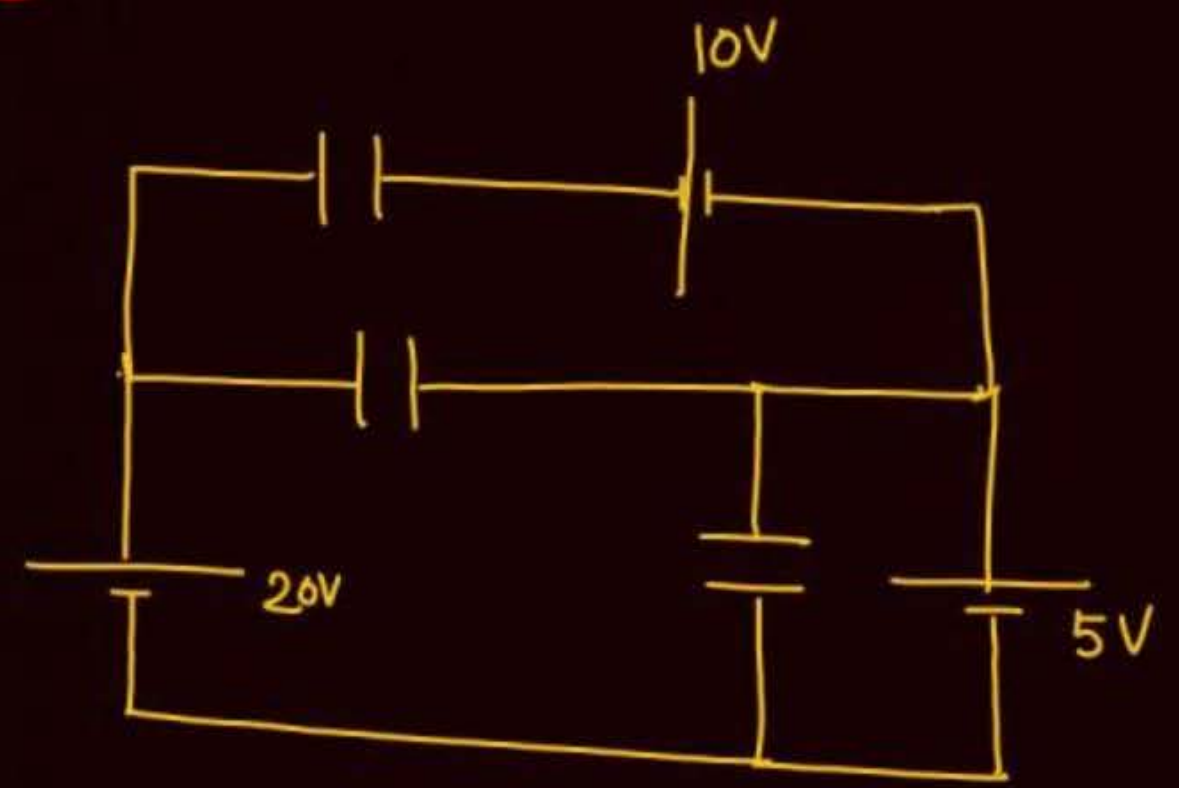
Homework of the class soñ pdf

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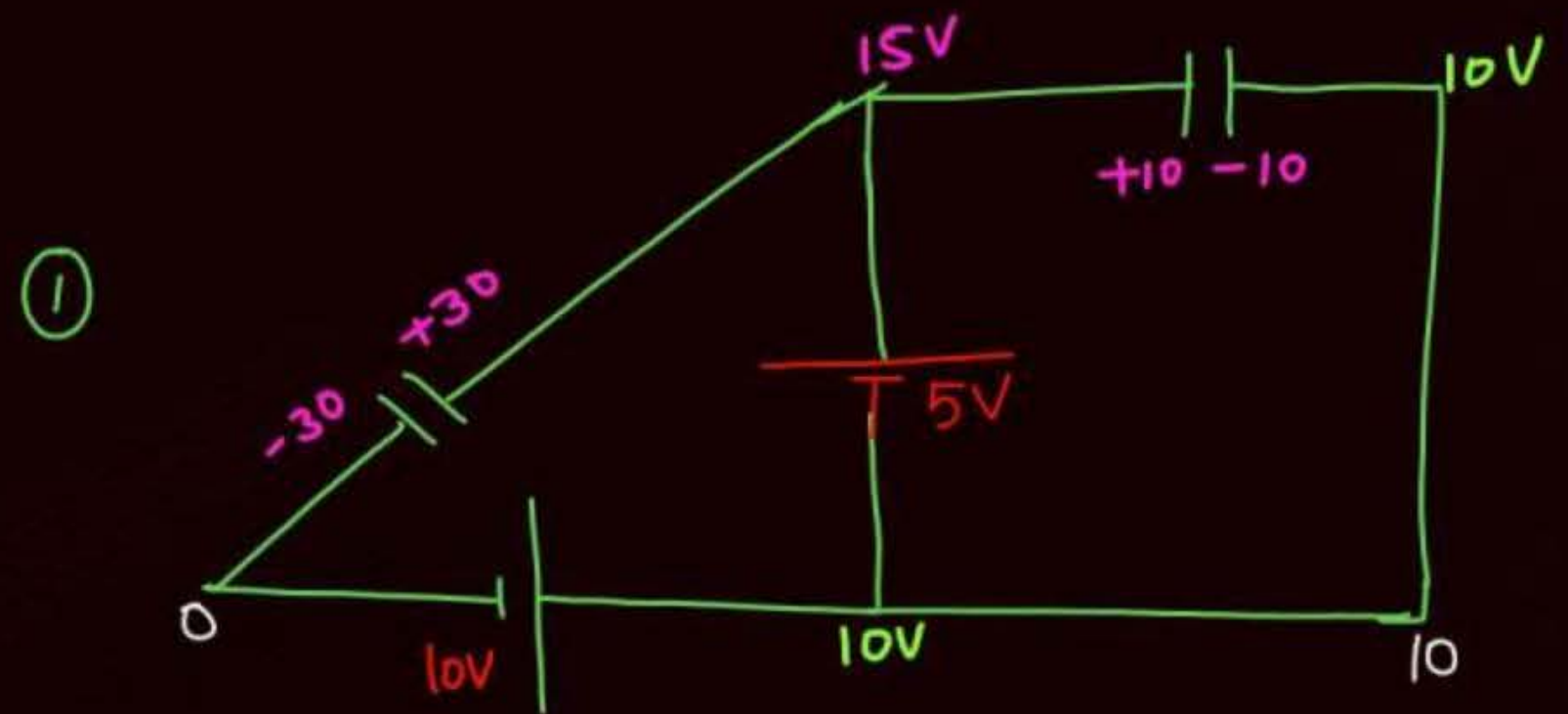
$C = 2\text{ F (each)}$

②



$C = 2\text{ F (each)}$

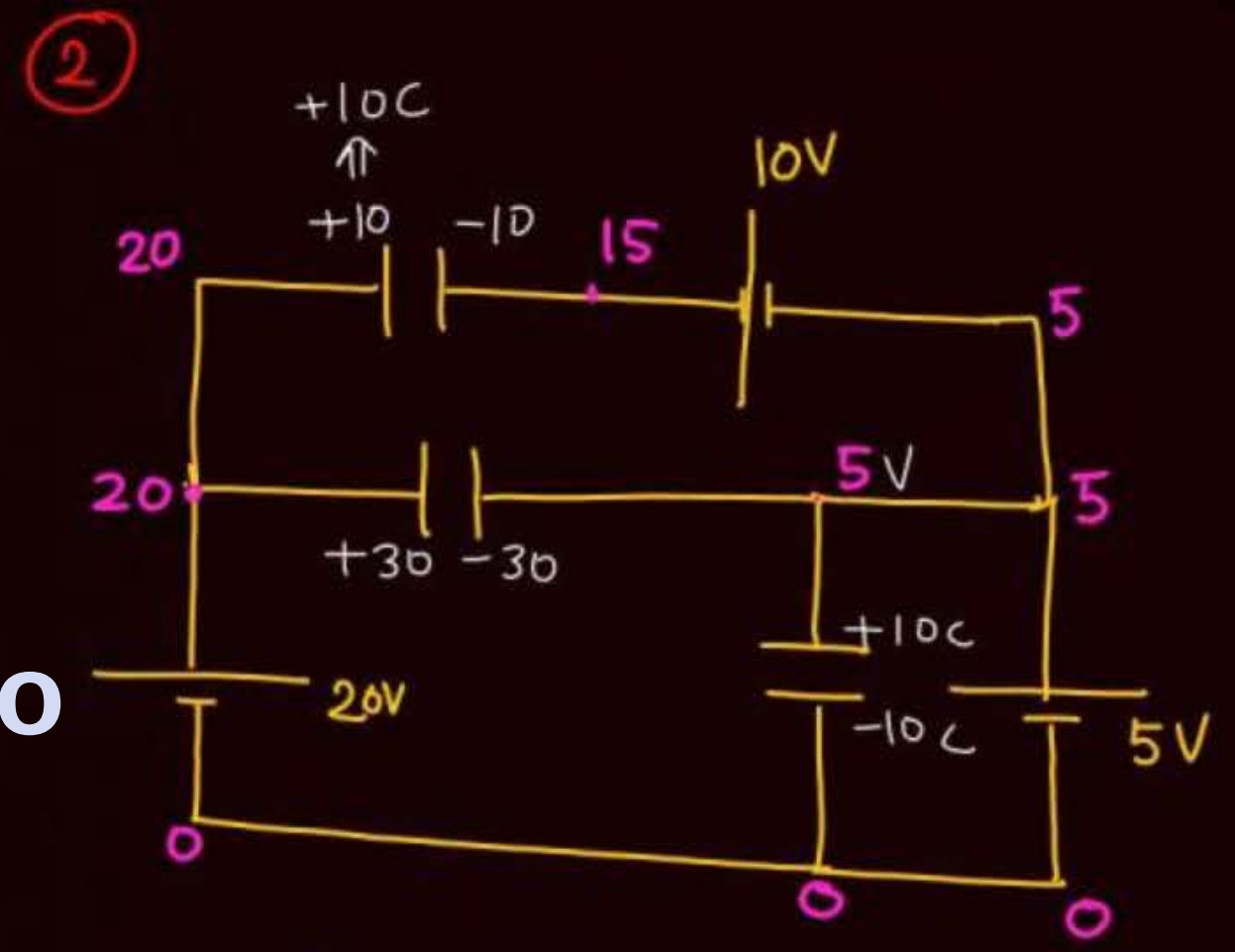
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$C = 2F$ (each)

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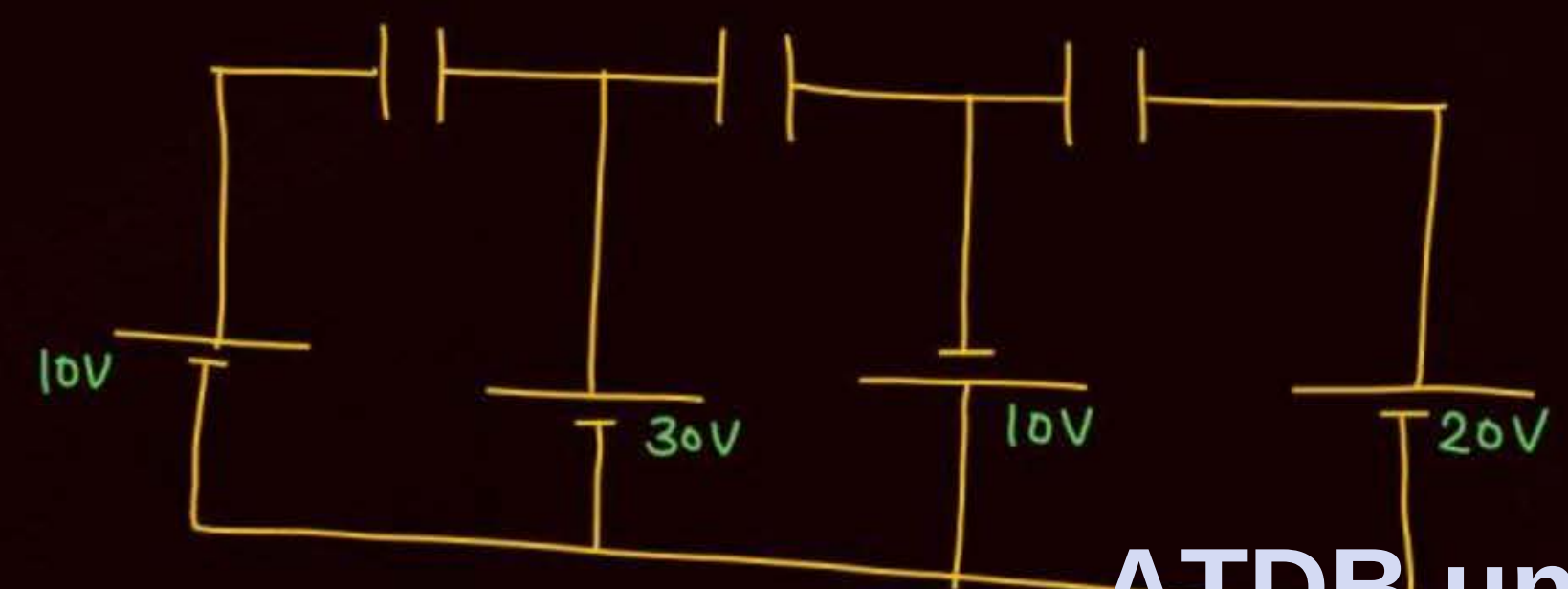
$\theta = CV$



$C = 2F$ (each)



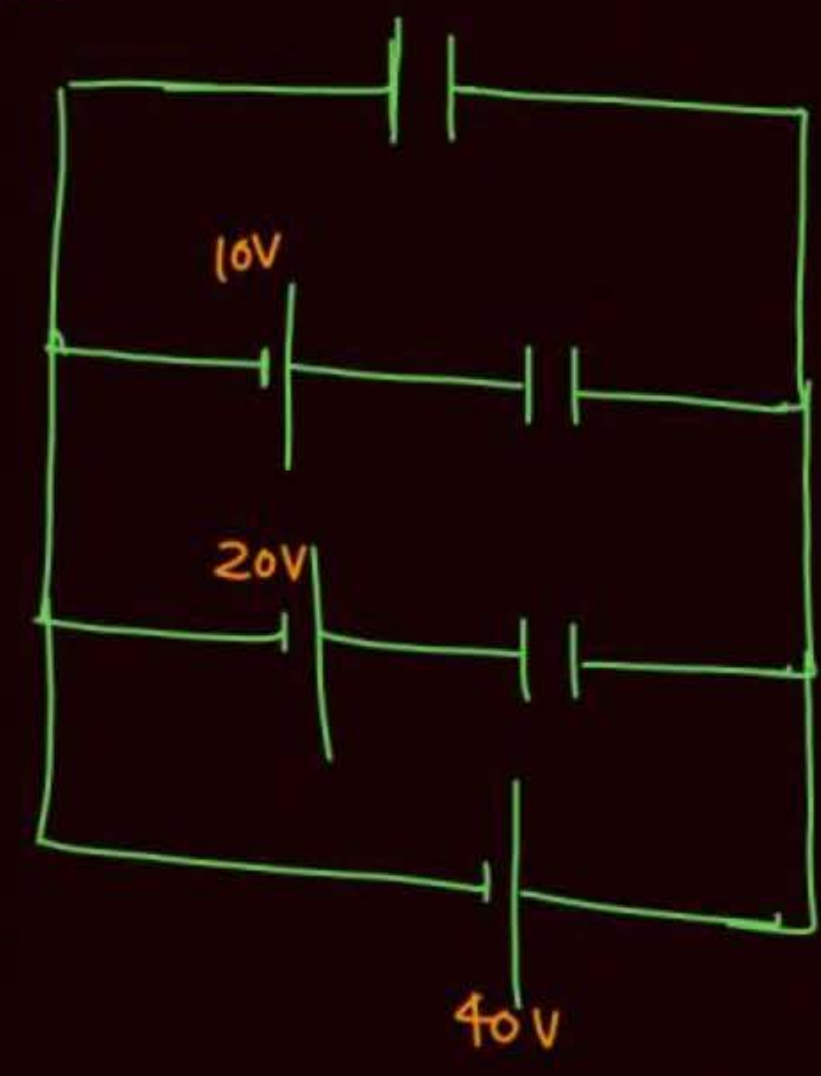
3



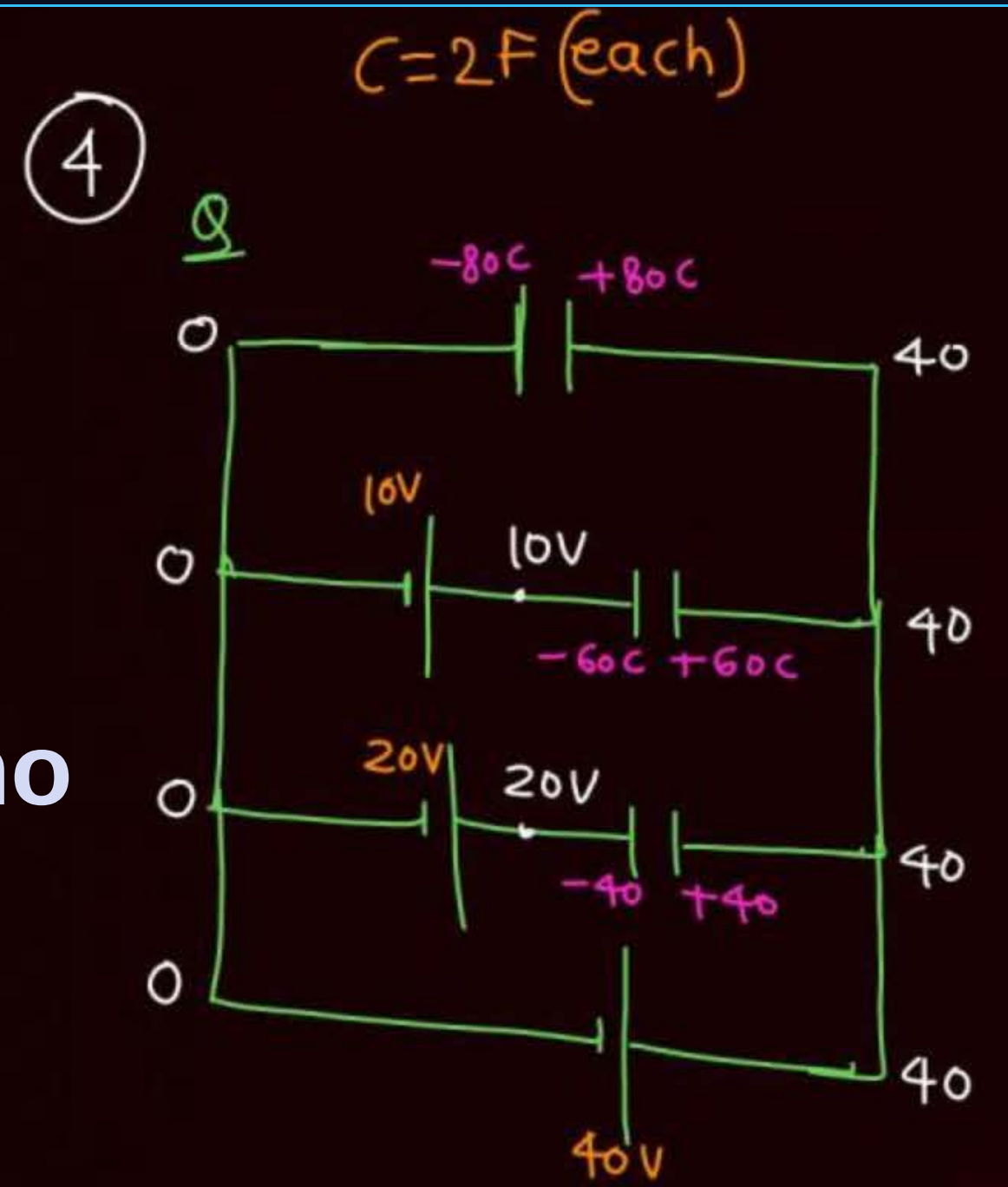
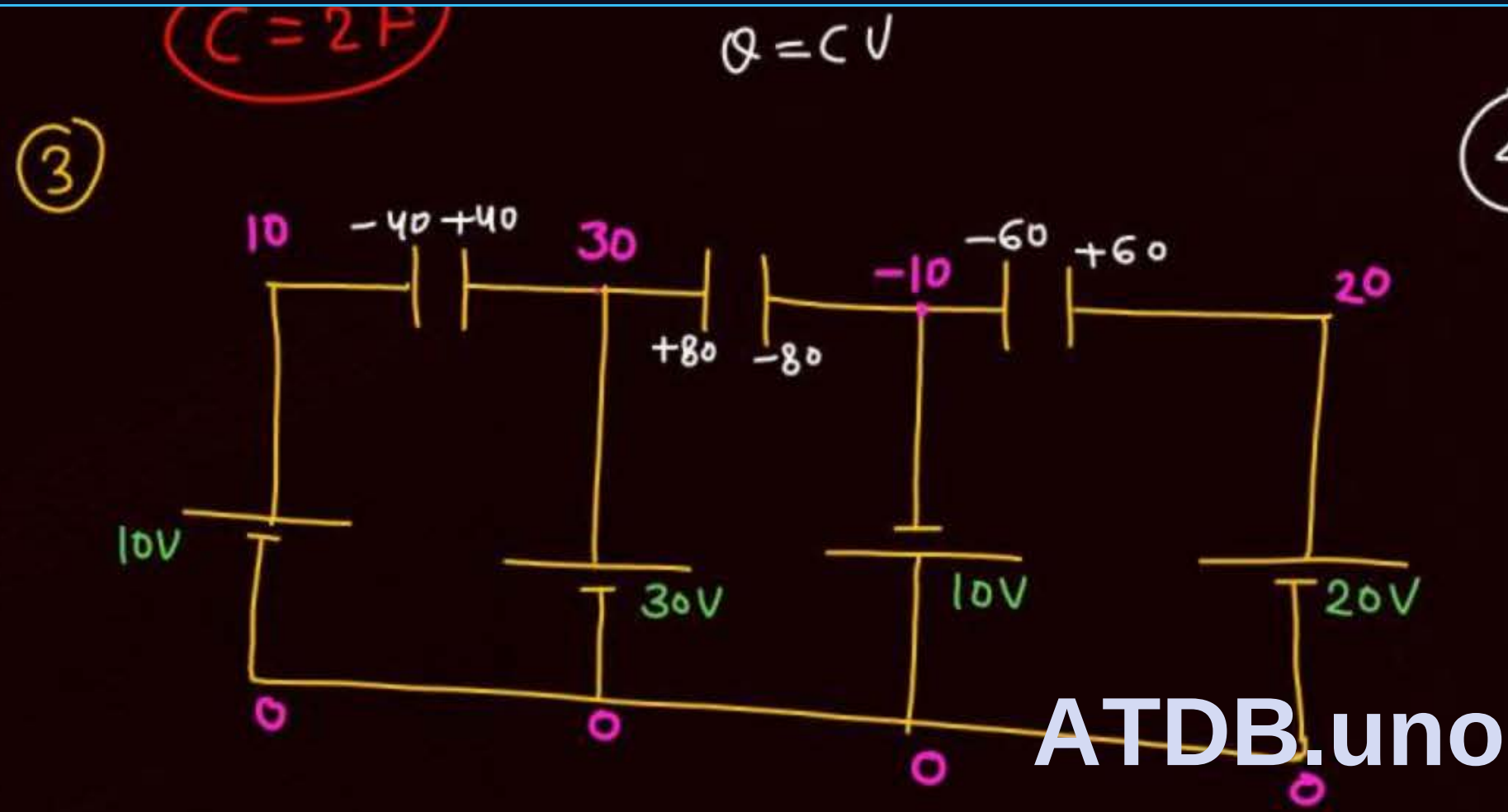
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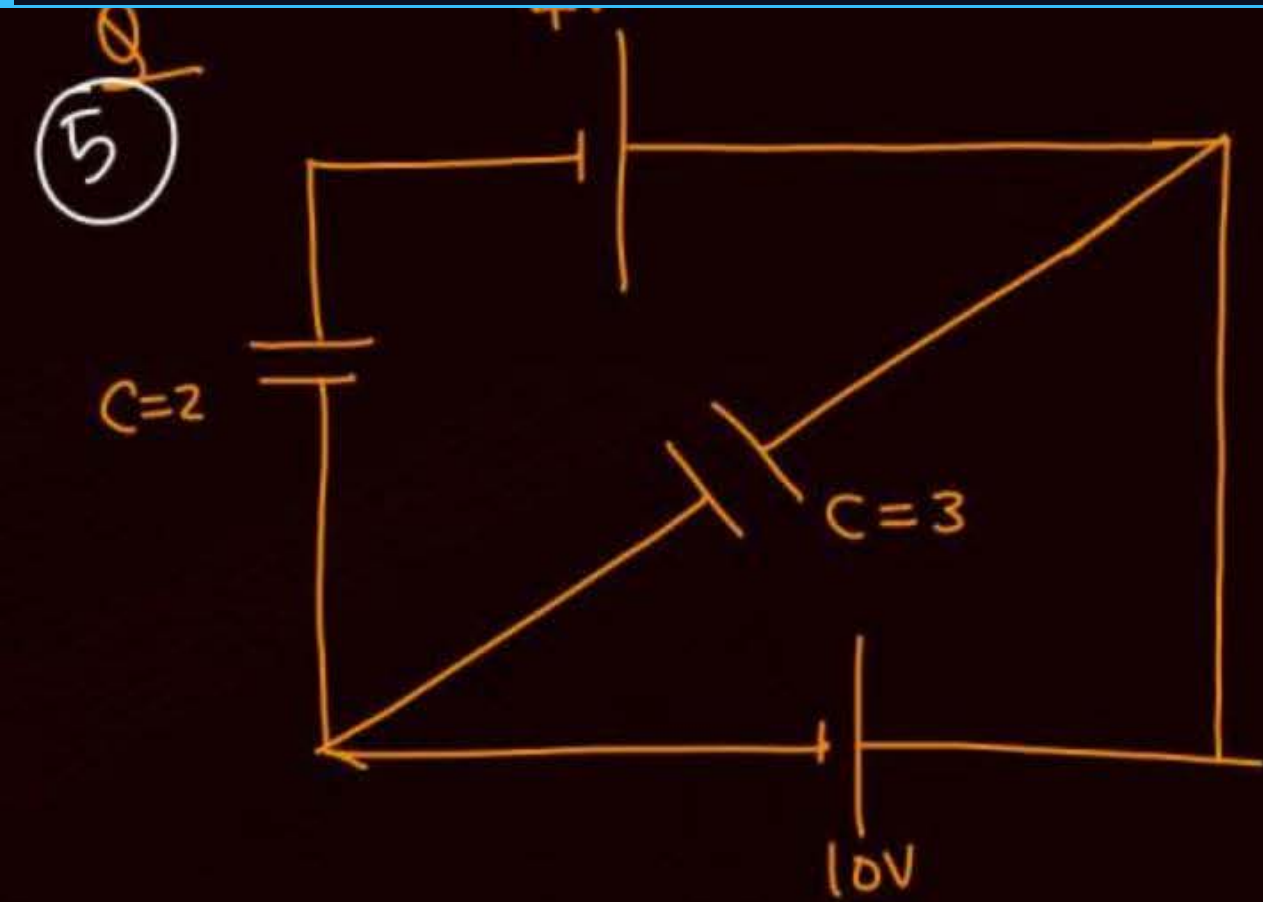
Q

$C = 2F$ (each)



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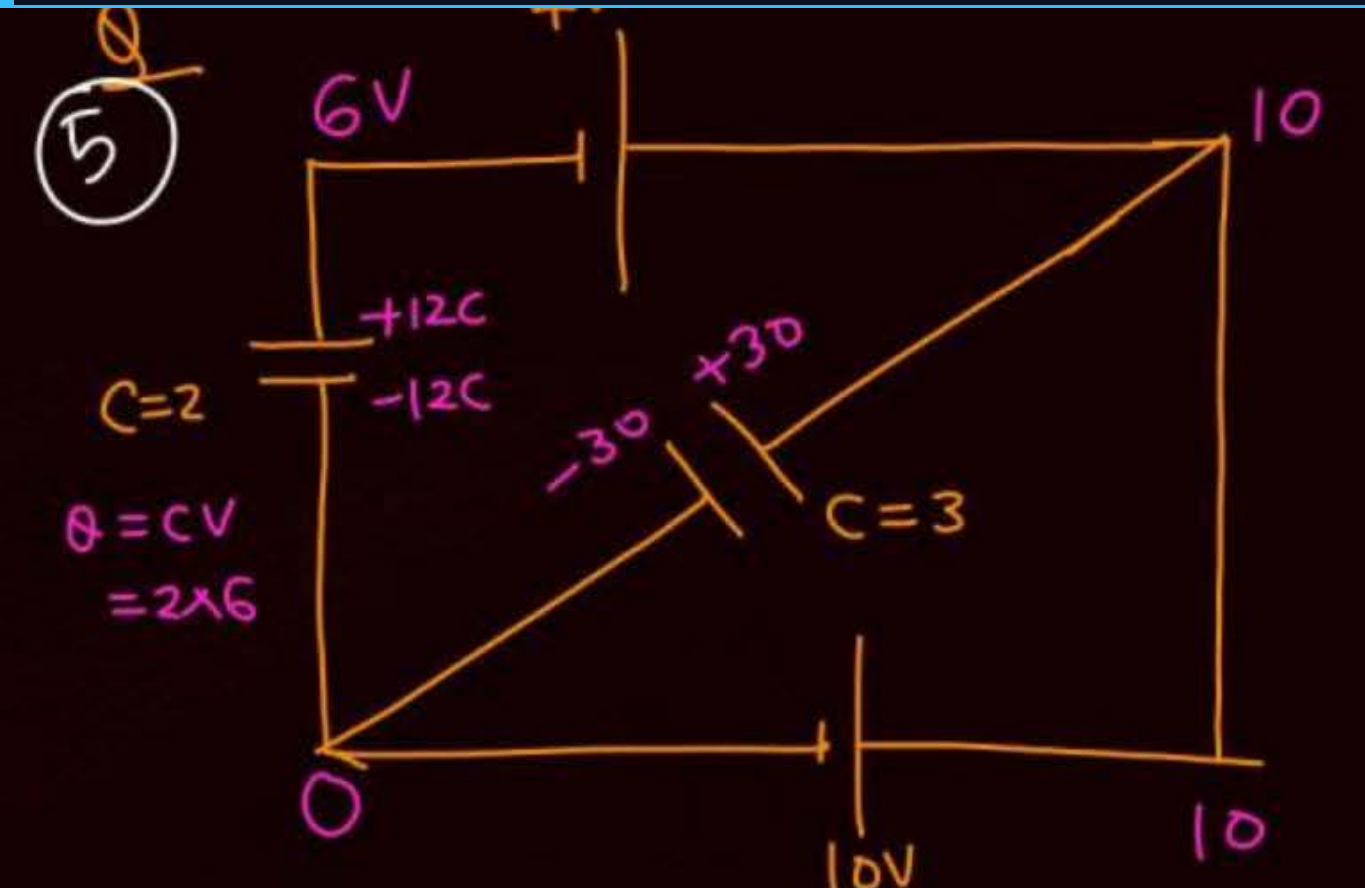


Q6



Find charge on capacitor C_1 & C_2 and current through 2Ω and 3Ω

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$Q = CV$
 $= 2 \times 6$

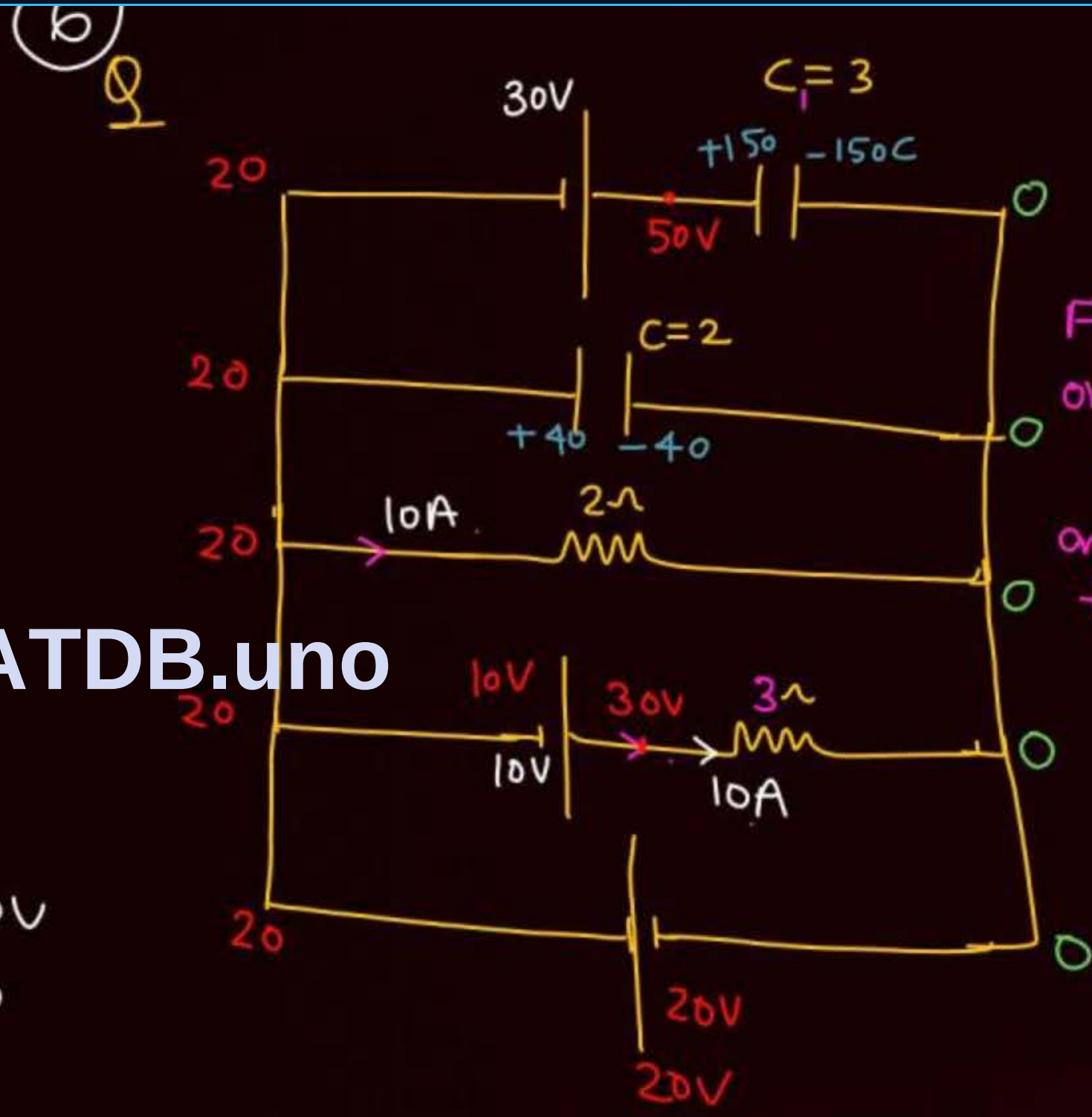
$20V$

2Ω

$0V$

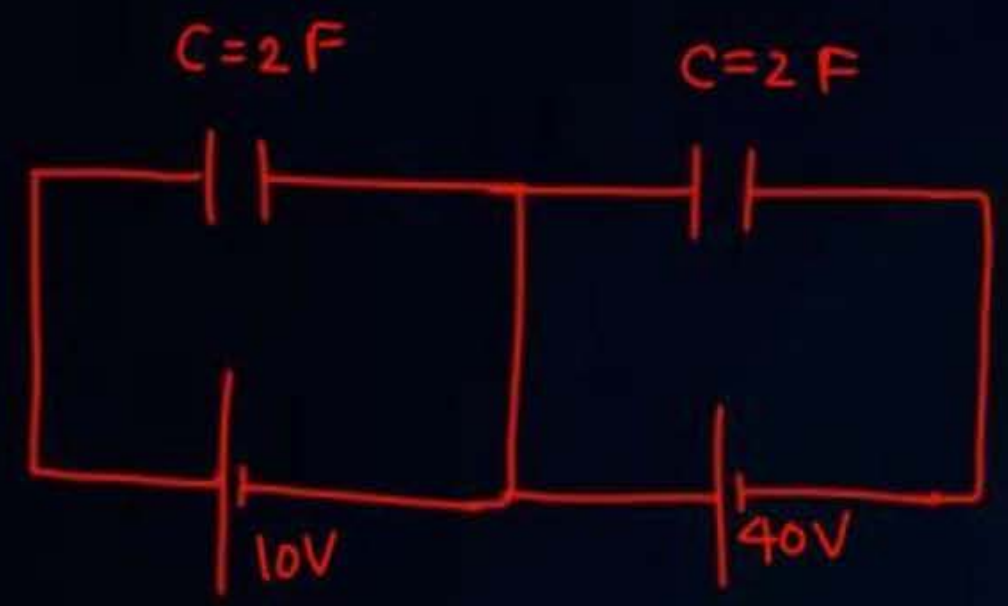
$I = \frac{20-0}{2} = 10$

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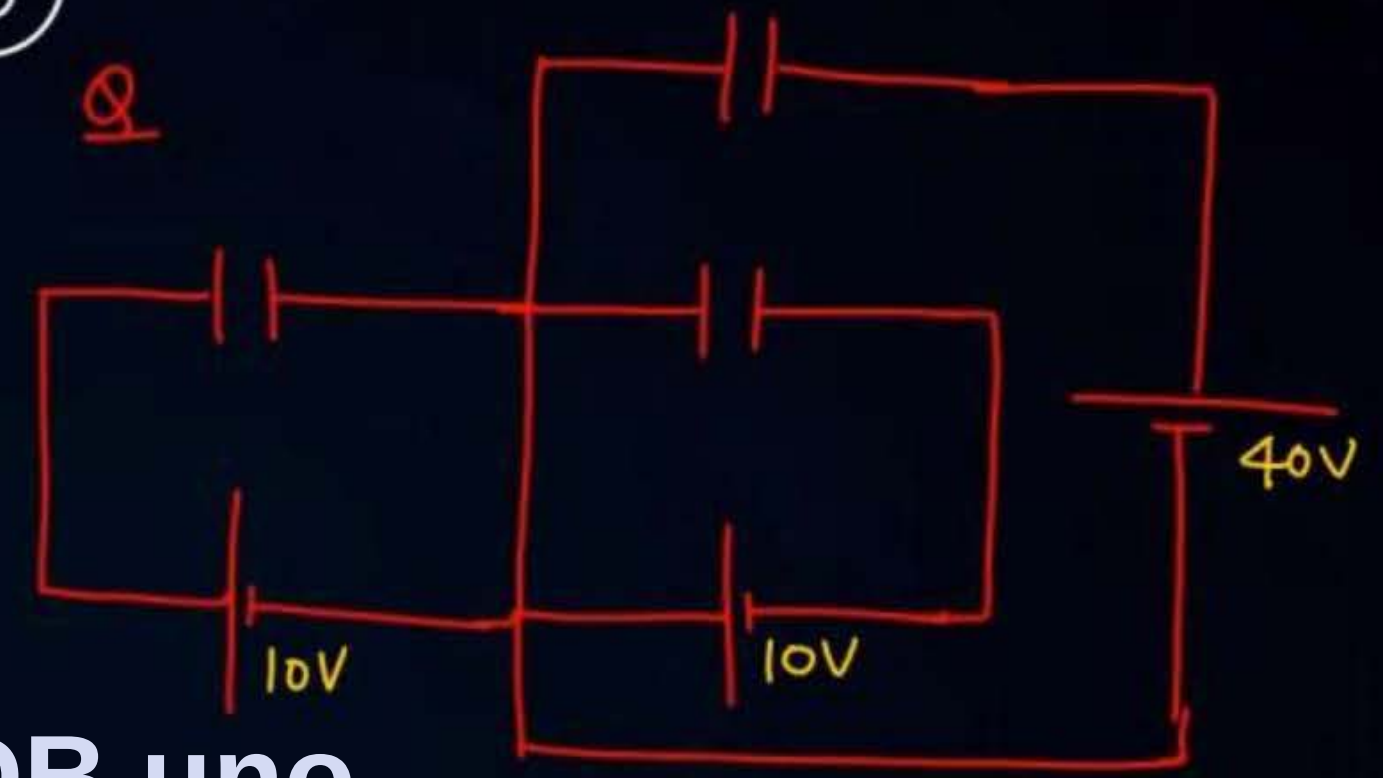


Find charge on capacitor C_1 & C_2 and current through 2Ω and 3Ω

7
Q



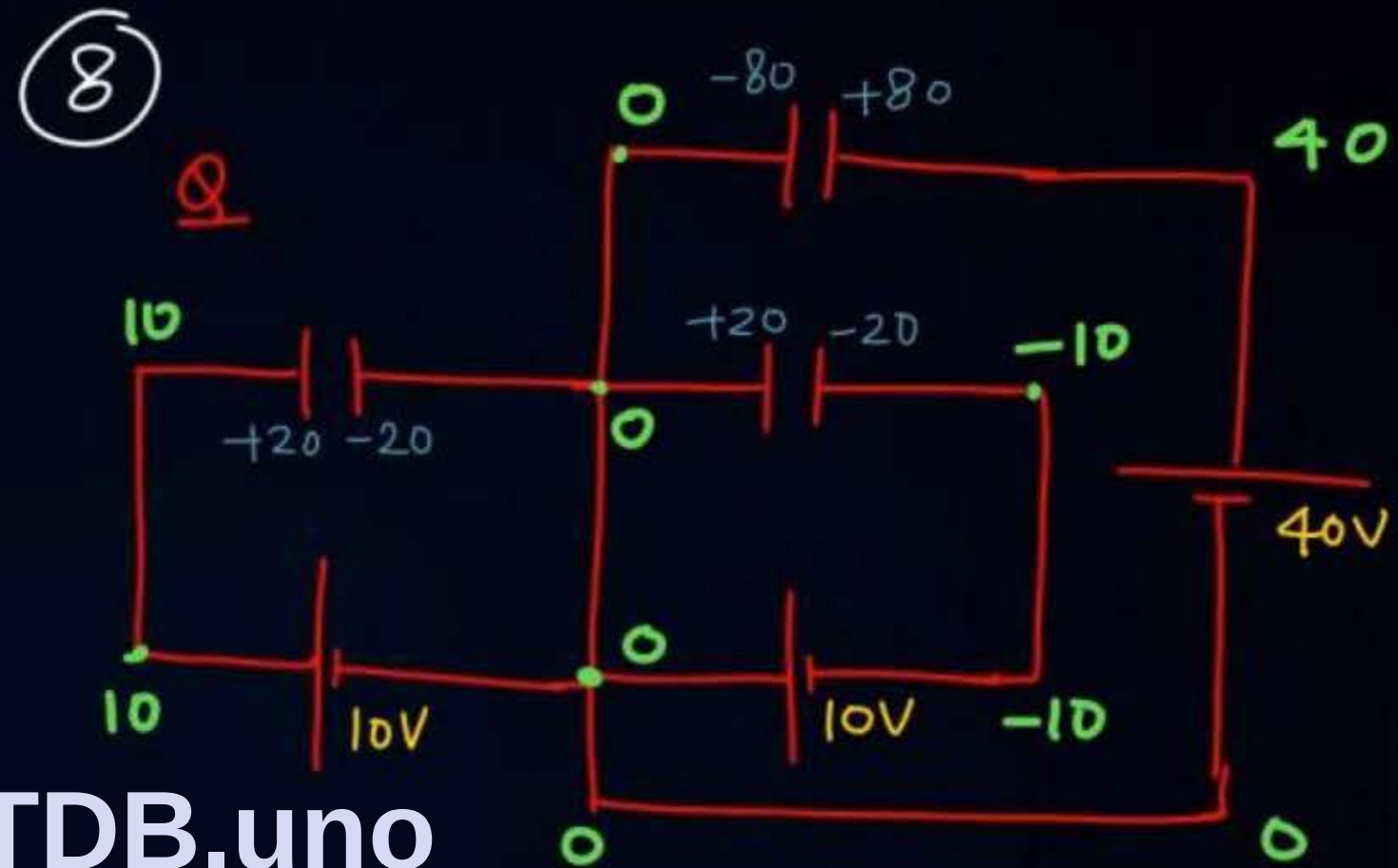
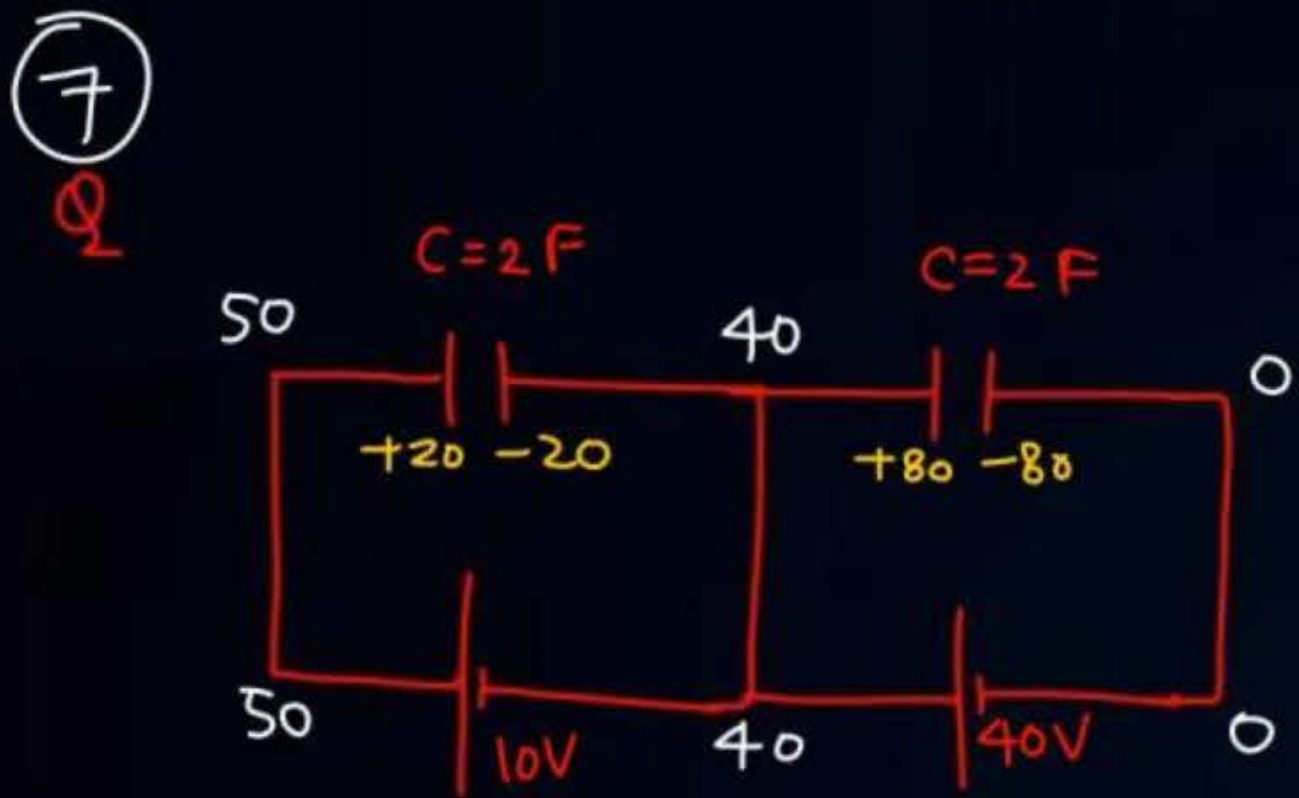
8
Q



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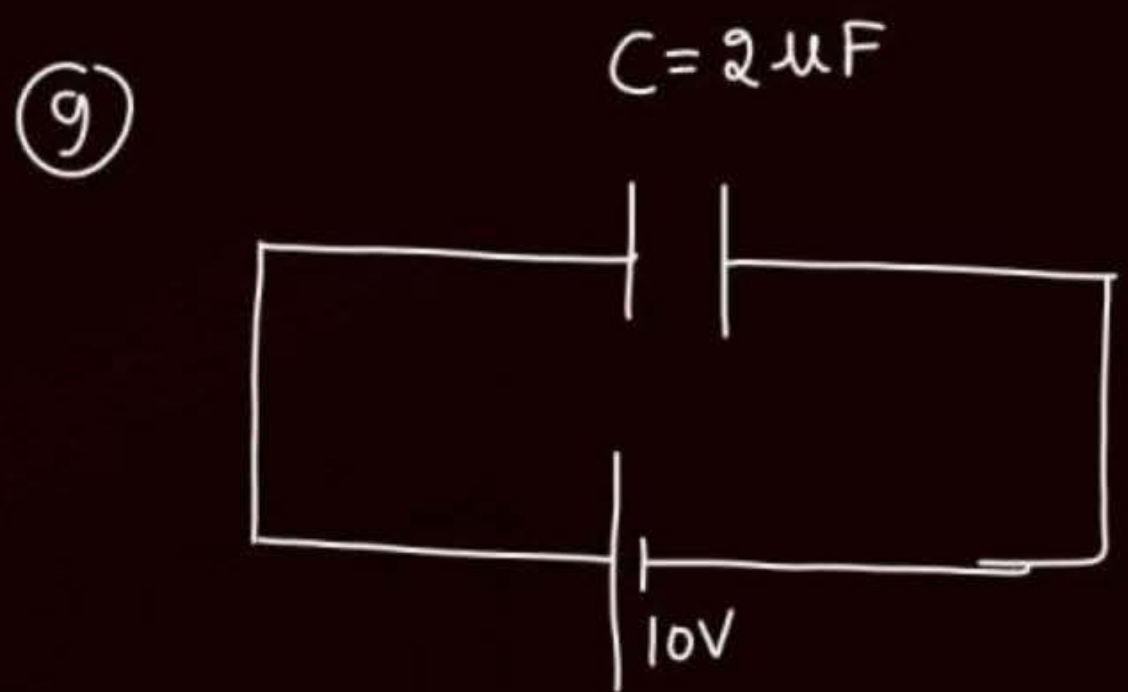
$C = 2\text{ F}$ (each)



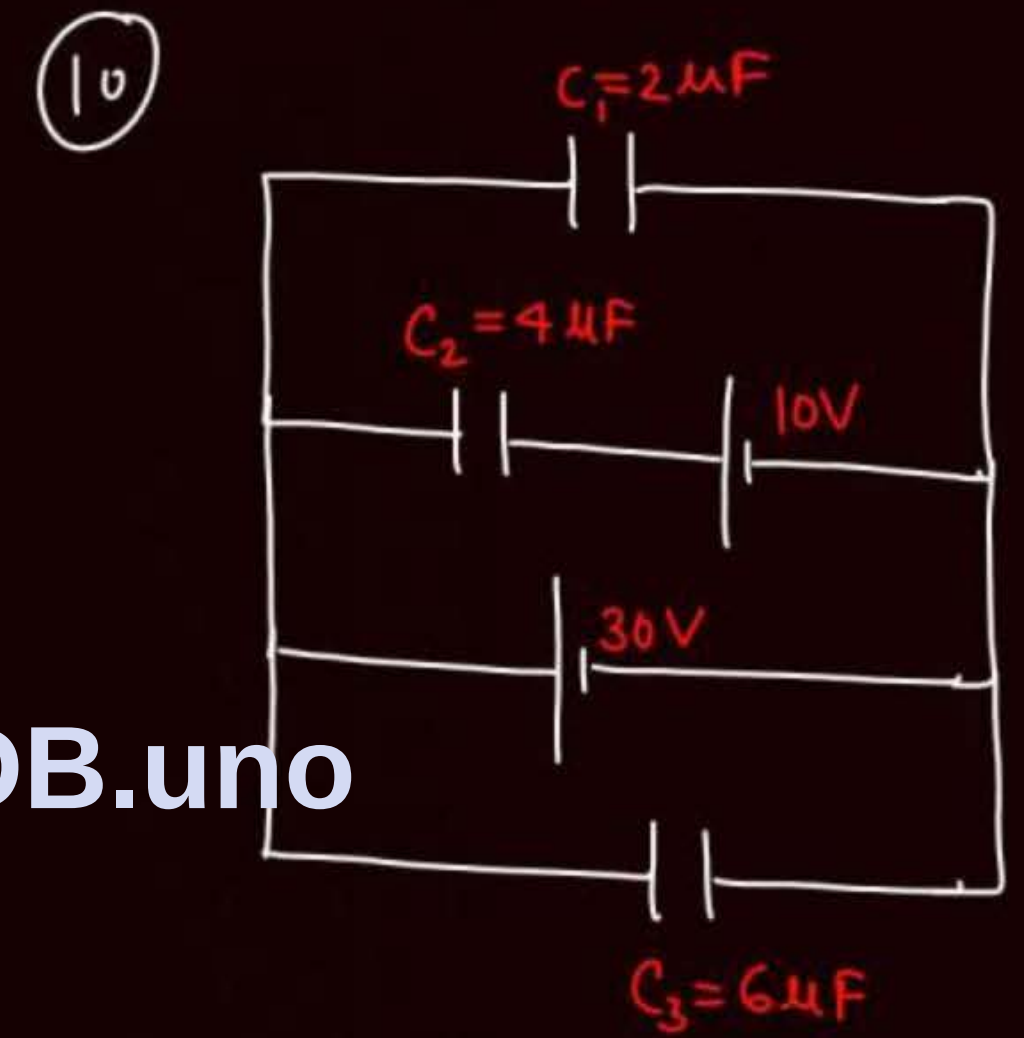


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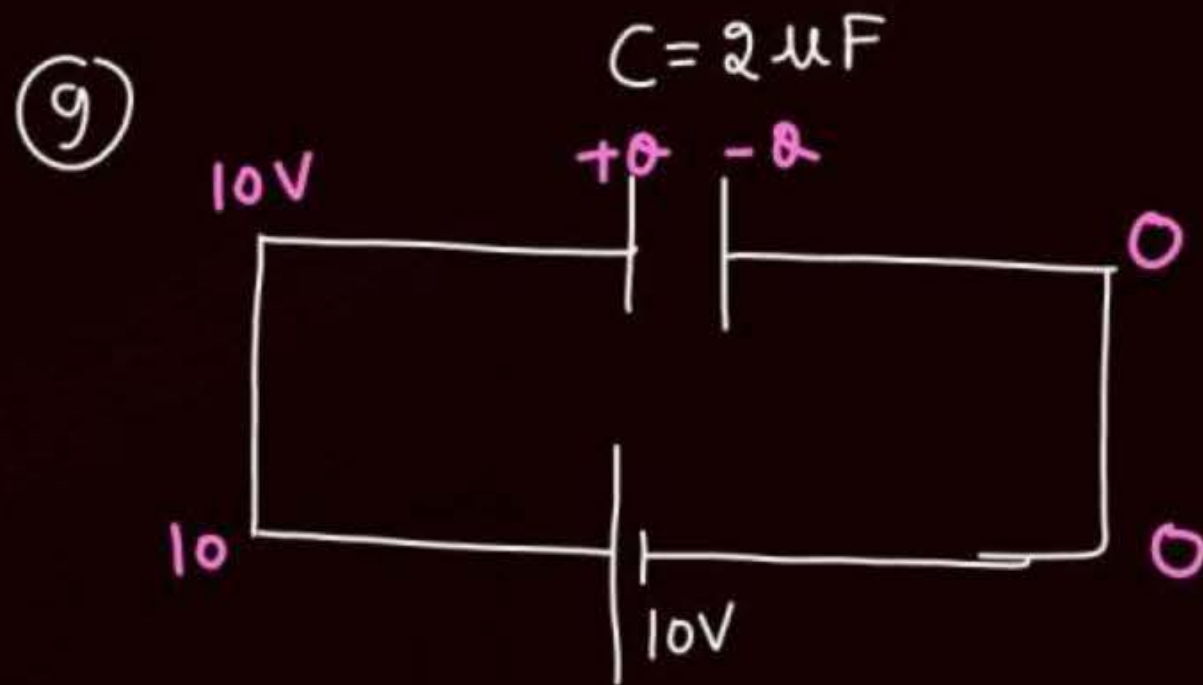
$C = 2\text{ F (each)}$



$C = 2\mu F = 2 \times 10^{-6} F$



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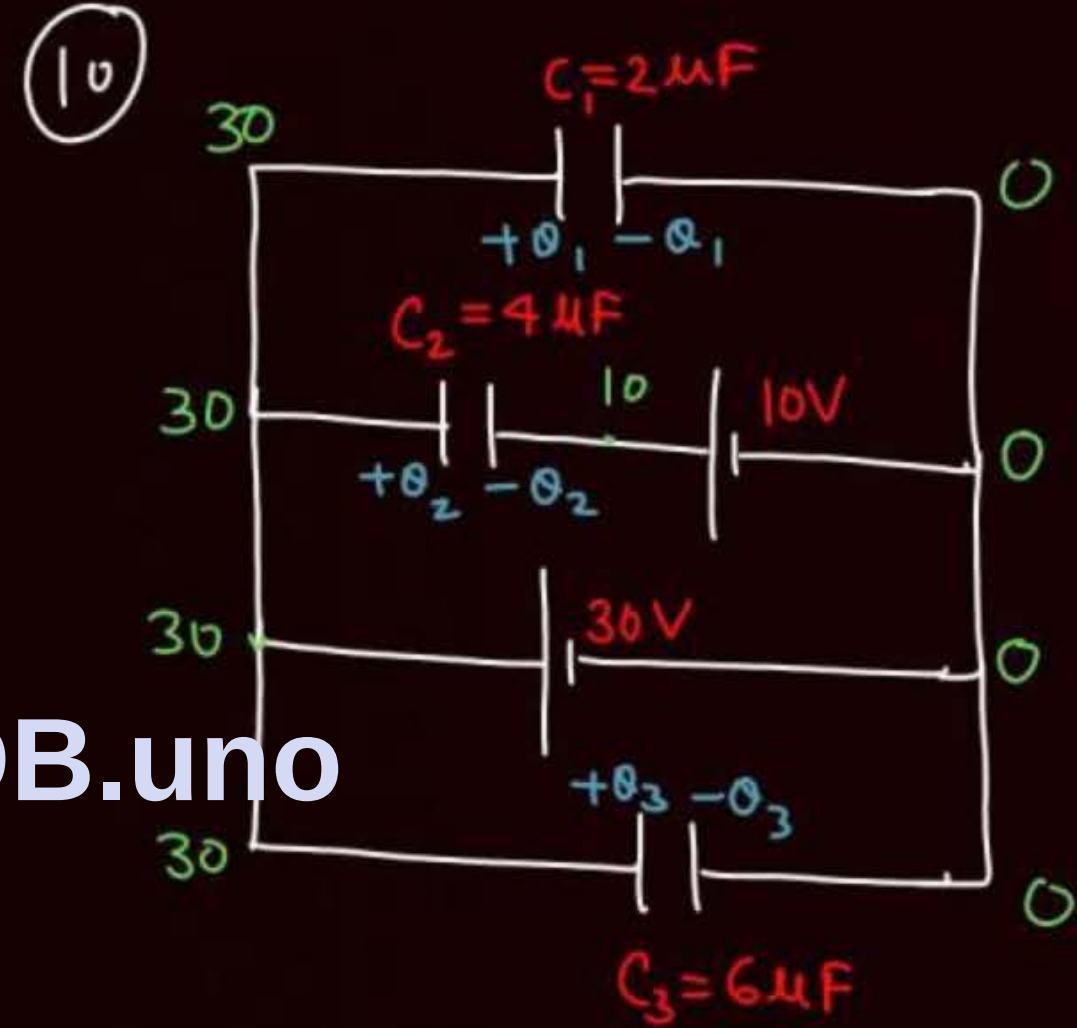
$$C = 2 \mu F = 2 \times 10^{-6} F$$

$$Q = CV = 2 \times 10^{-6} \times 10$$

$$= 20 \times 10^{-6} \text{ Coulomb}$$

$$= 20 \mu C$$

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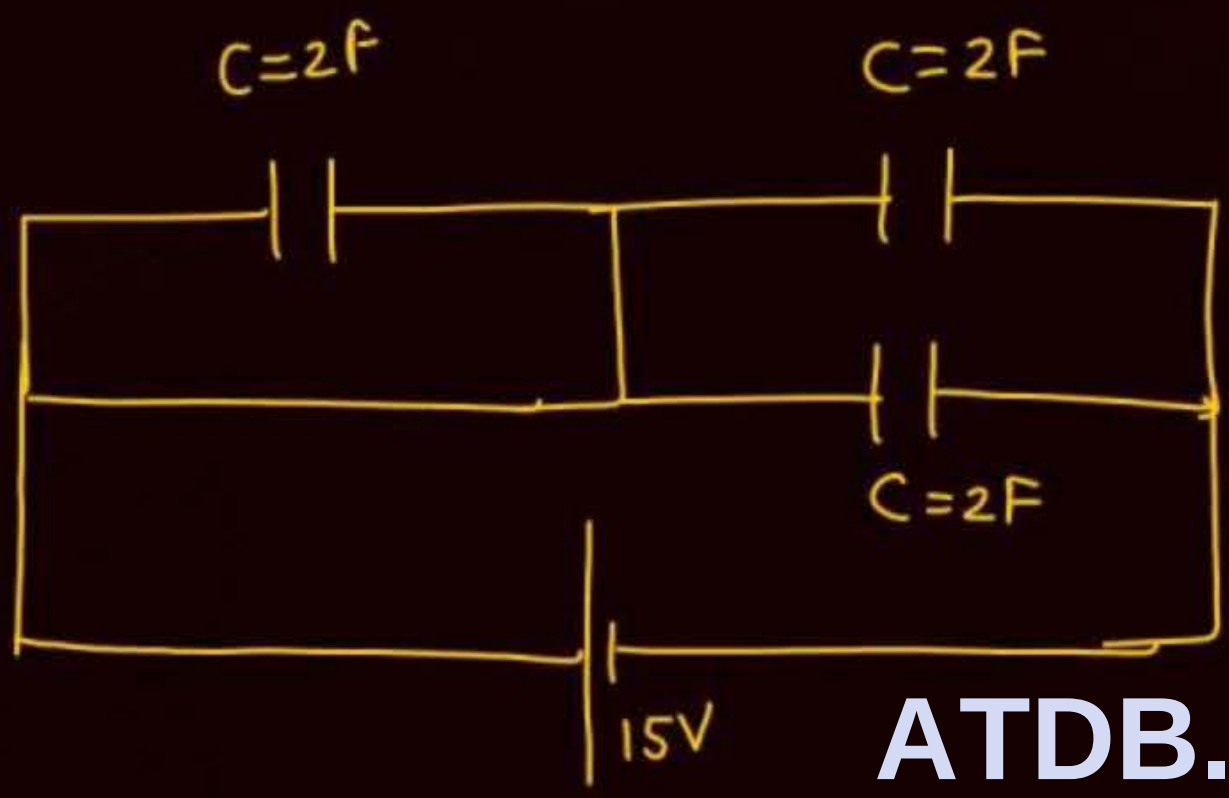
$$Q_1 = 2 \times 30 = 60 \mu C$$

$$Q_2 = 4 \times 20 = 80 \mu C$$

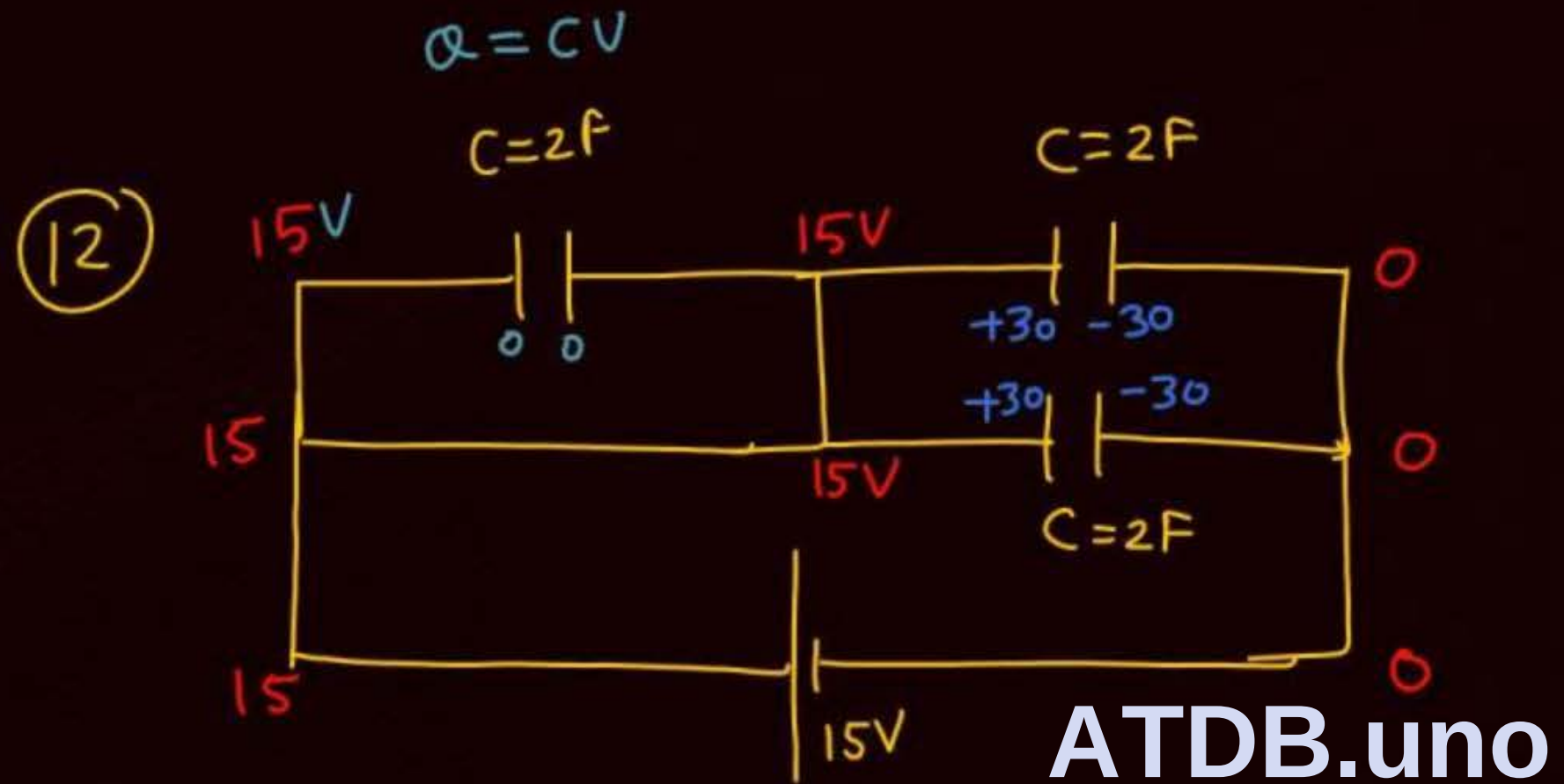
$$Q_3 = 6 \times 30 = 180 \mu C$$



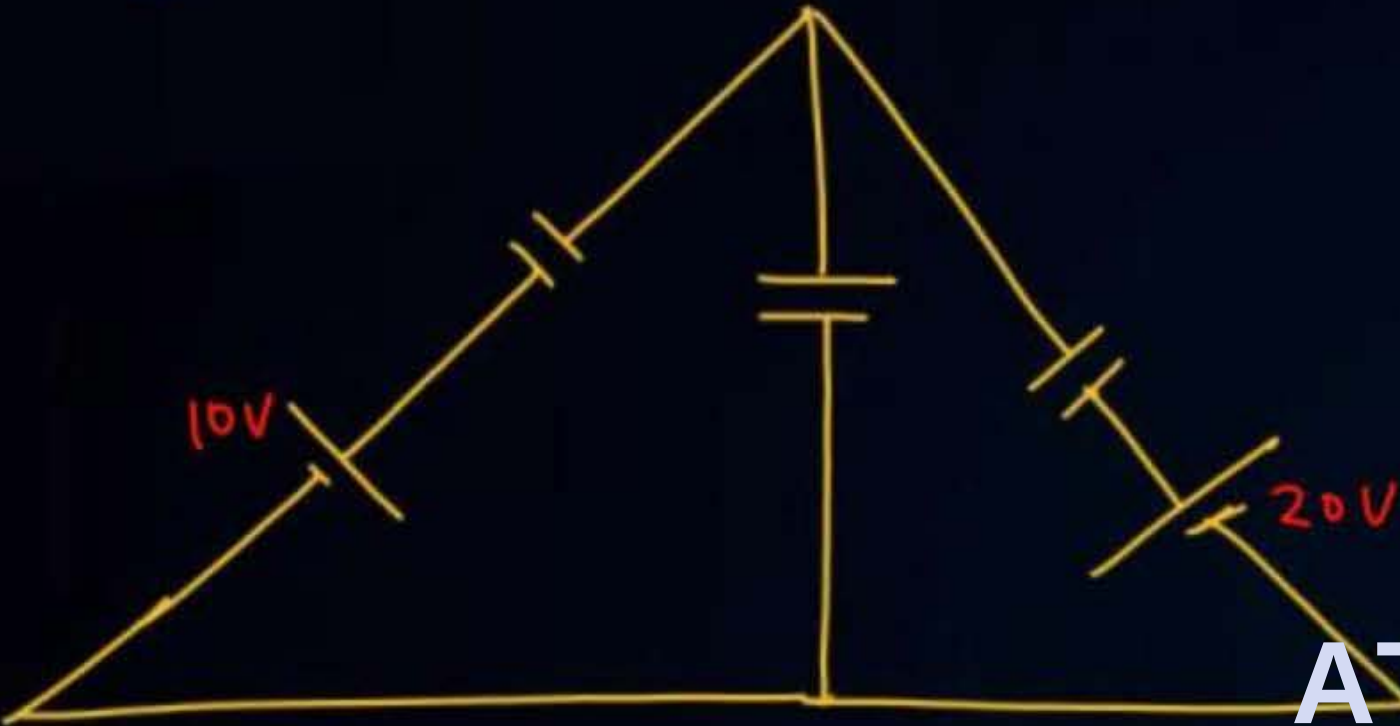
12



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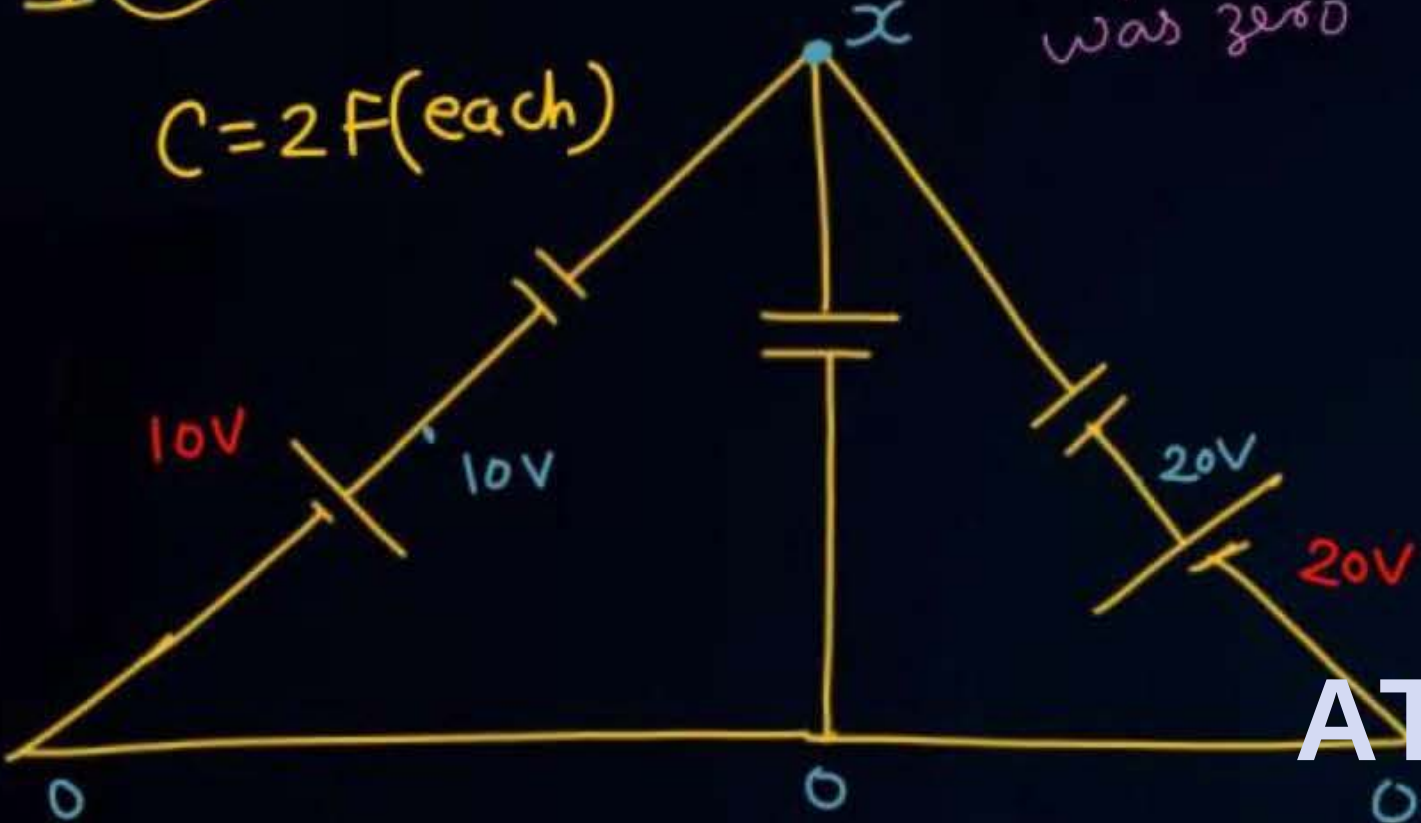


Q (13)



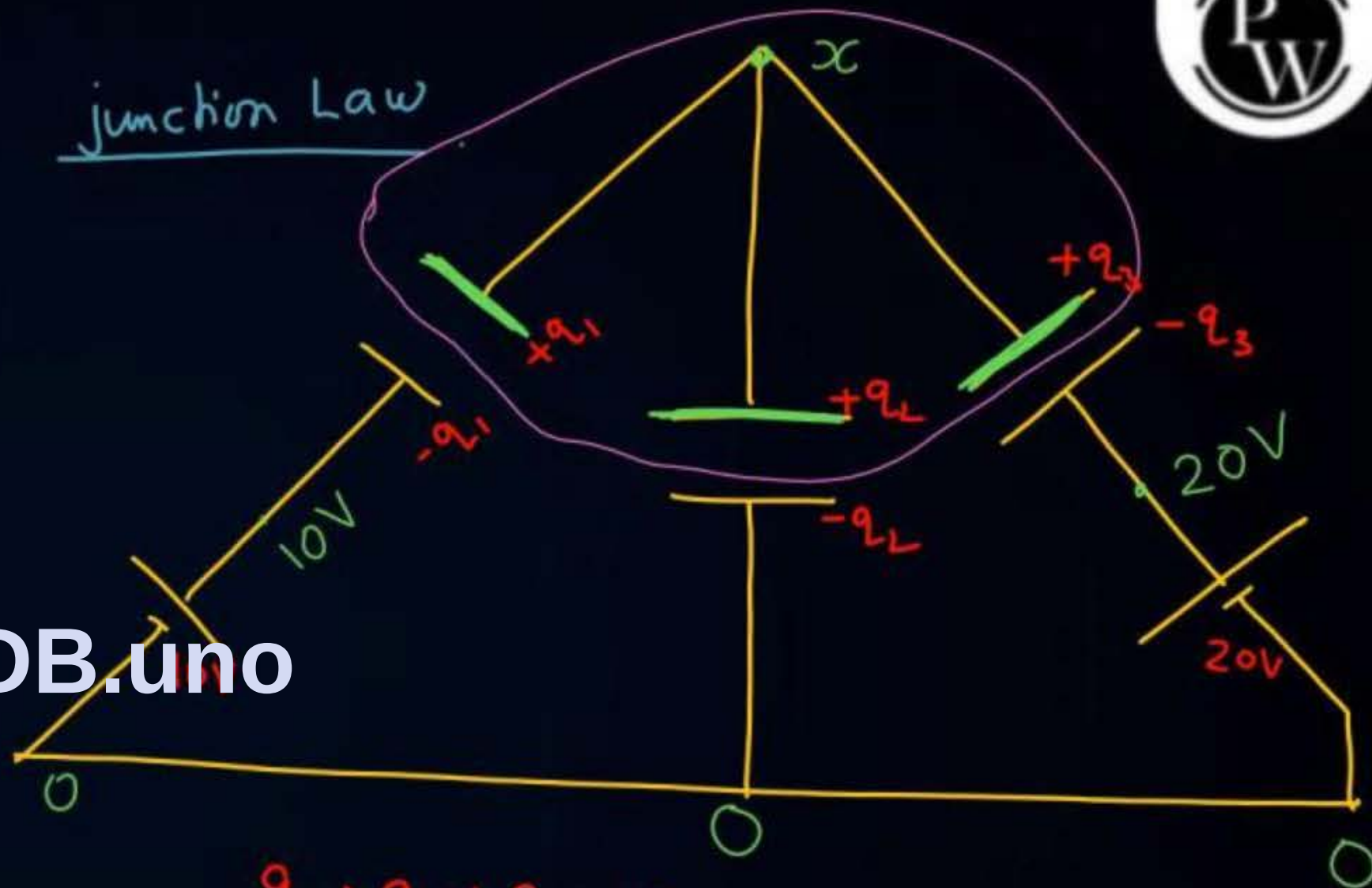
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Q (13) Assume initially charge on all capacitors was zero



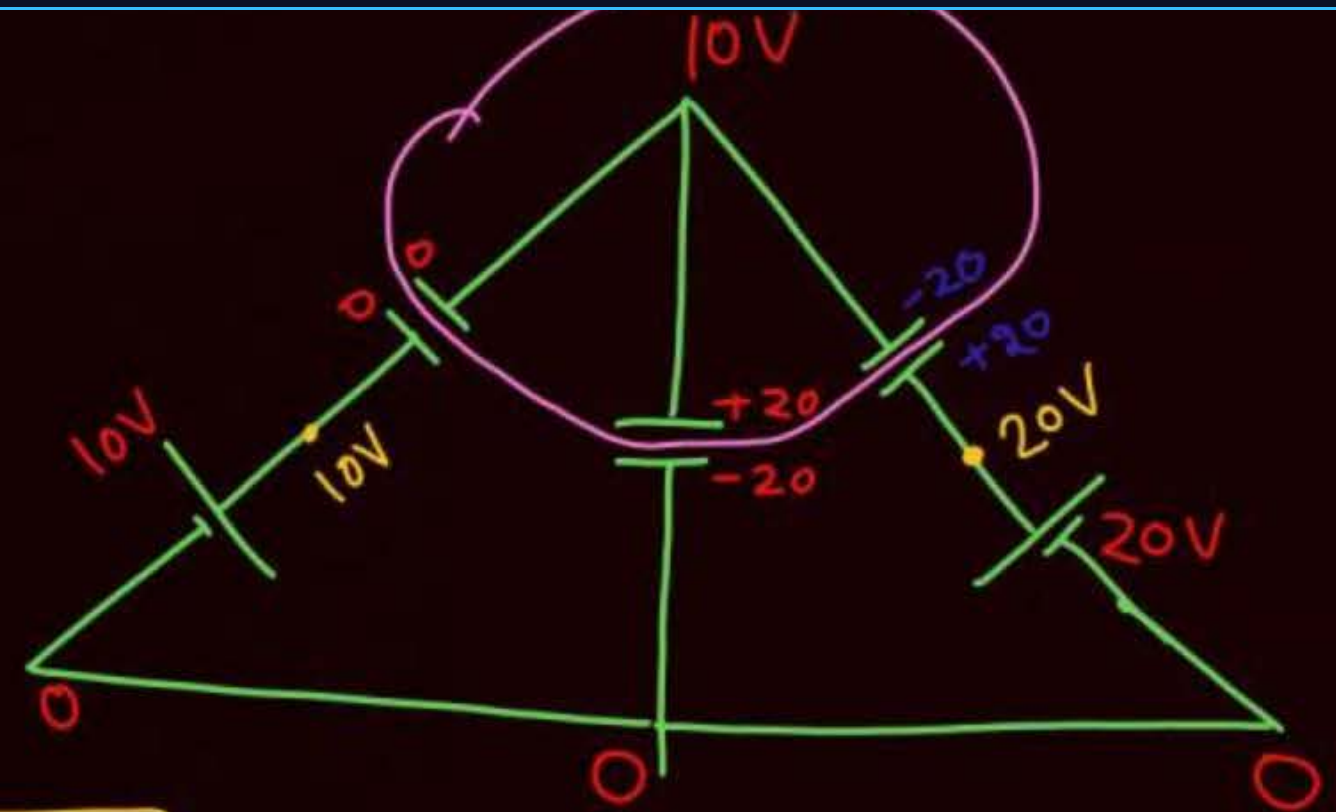
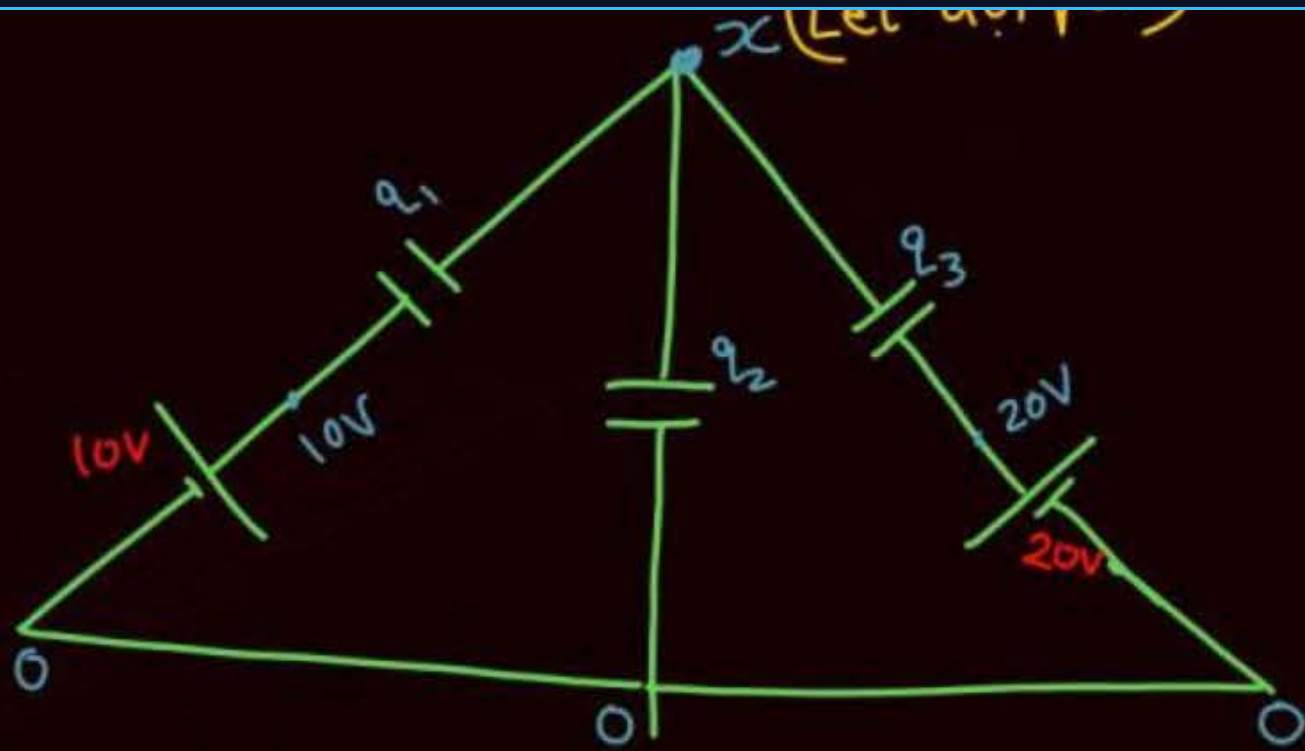
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junction Law



$$q_1 = 2 \times 0 = 0$$
$$q_2 = 2 \times 10 = 20$$
$$q_3 =$$

$$q_1 + q_2 + q_3 = 0$$
$$2 \times (x - 10) + 2 \times (x - 0) + 2 \times (x - 20) = 0$$
$$6x - 20 - 40 = 0$$
$$x = 10$$



$$C = 2 \text{ F (each)}$$

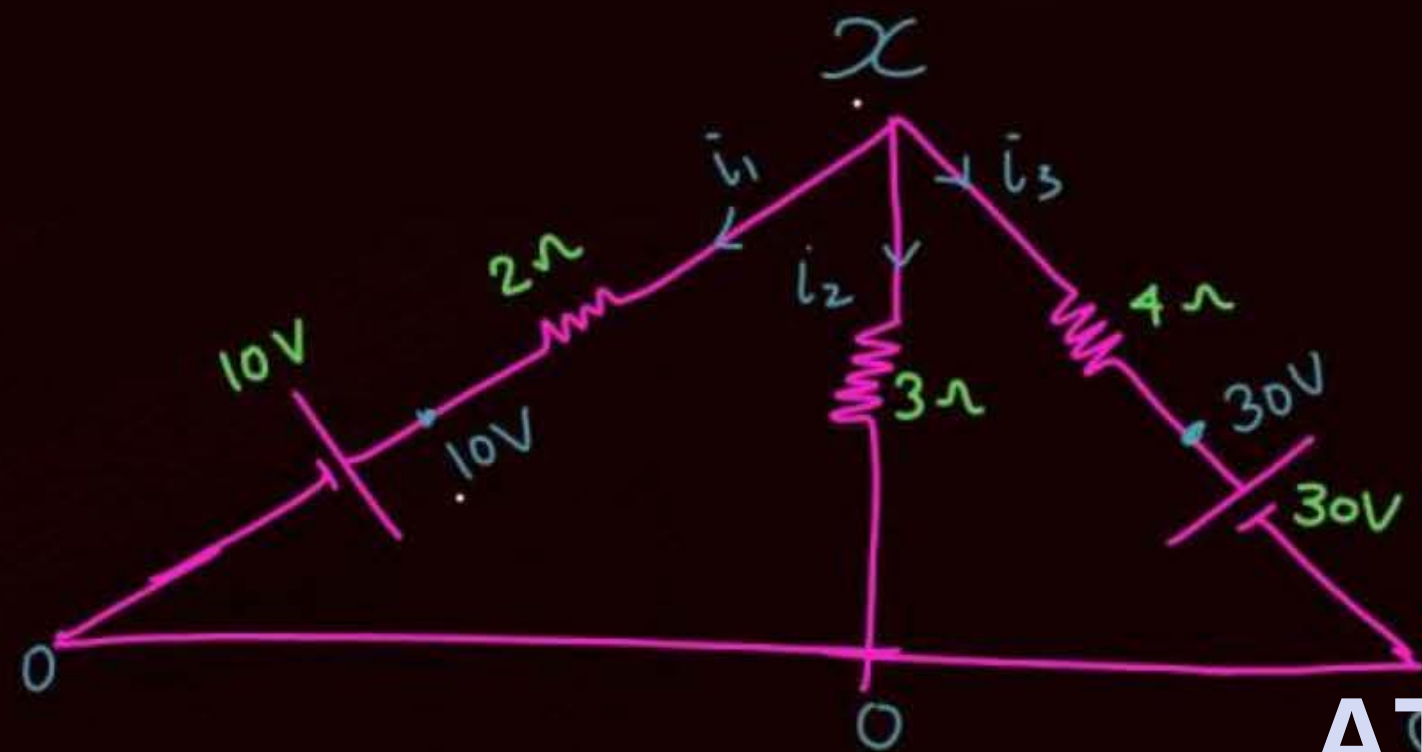
$$q = CV = QC$$

$$q_1 + q_2 + q_3 = 0$$

$$(x - 10) \times 2 + (x - 0) \times 2 + (x - 20) \times 2 = 0$$

$$6x = 60$$

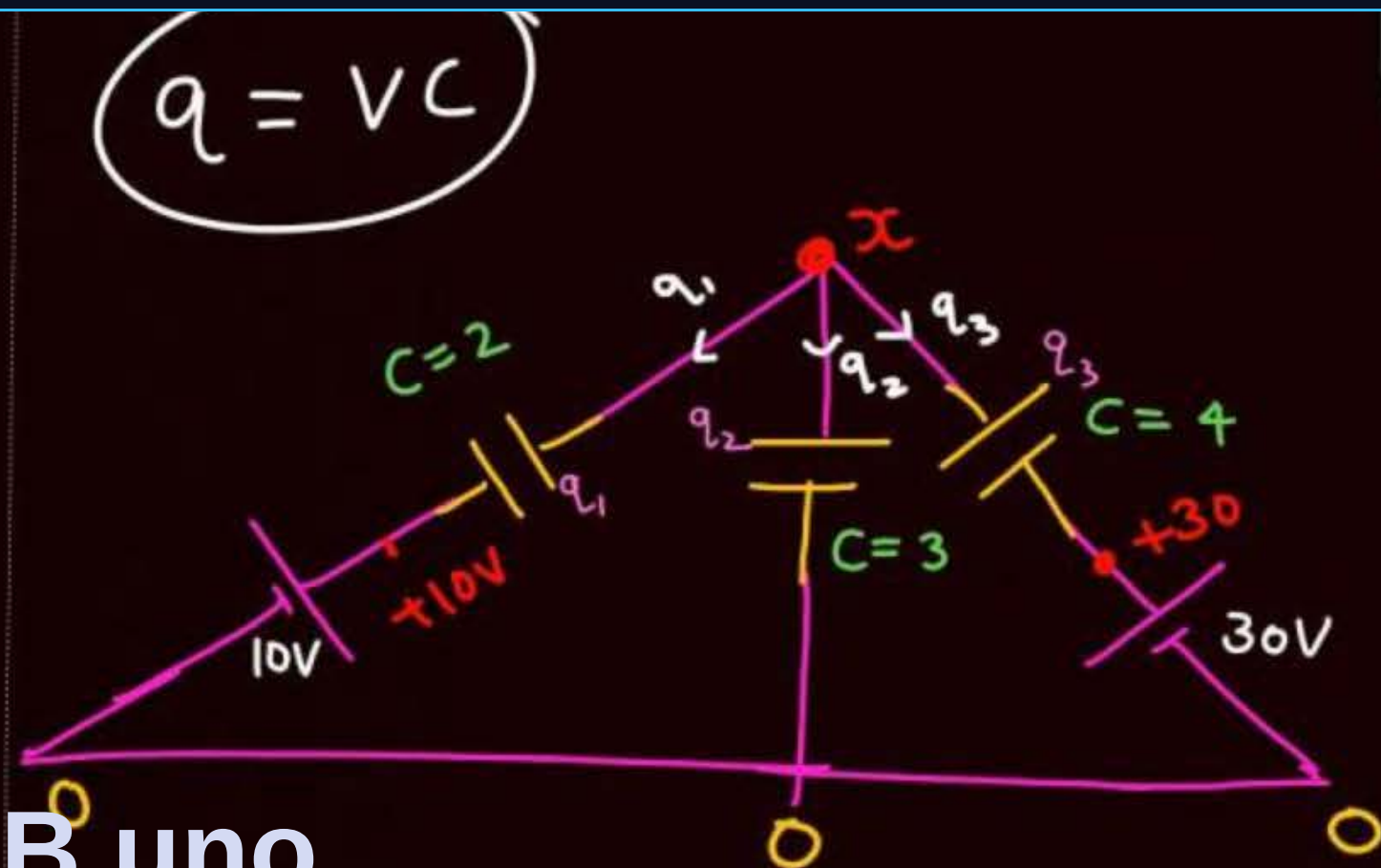
$$x = 10 \text{ (matlab)}$$



$$i_1 + i_2 + i_3 = 0$$

$$\frac{x-10}{2} + \frac{x-0}{3} + \frac{x-30}{4} = 0$$

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$$q_1 + q_2 + q_3 = 0$$

$$(x-10) \times 2 + (x-0) \times 3 + (x-30) \times 4 = 0$$

Initial charge on each capacitor was zero

$+q_4$

$C=5F$

$C=3F$

$30V$

$+q_3$

q_3

q_1

$+q_1$

$C=2F$

q_2

$+q_4$

$C=4F$

$10V$

$20V$

$30V$

$10V$

q_4

x

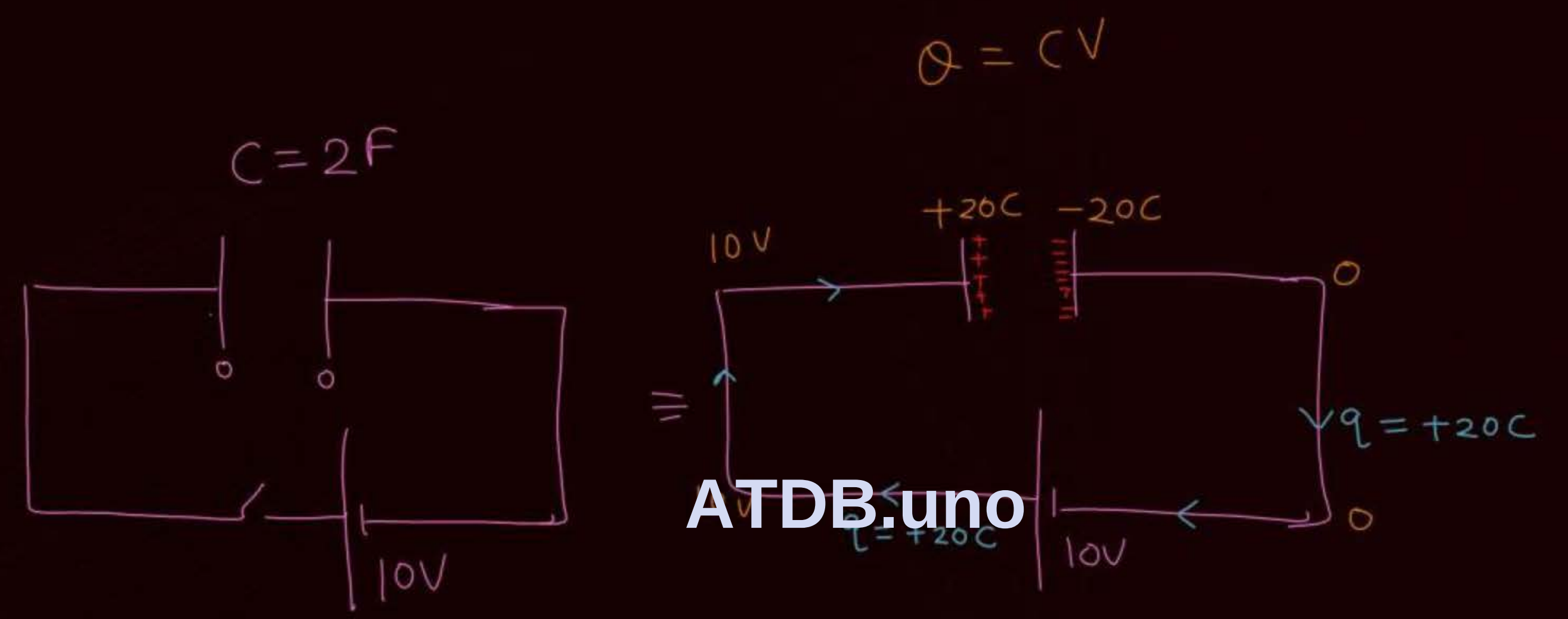
q_1

q_2

q_3

q_4

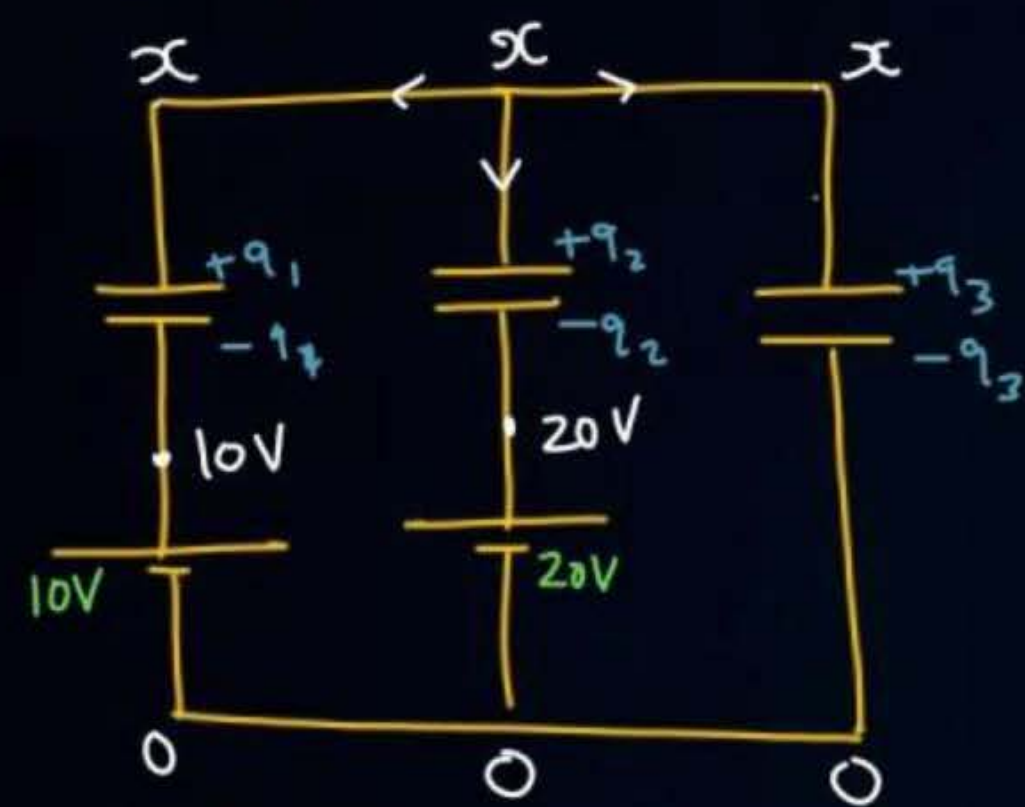
$$q_1 + q_2 + q_3 + q_4 = 0$$
$$(x-0) \times 2 + (x-10) \times 4 + (x-30) \times 3 + (x-30) \times 5 = 0$$



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Q
14

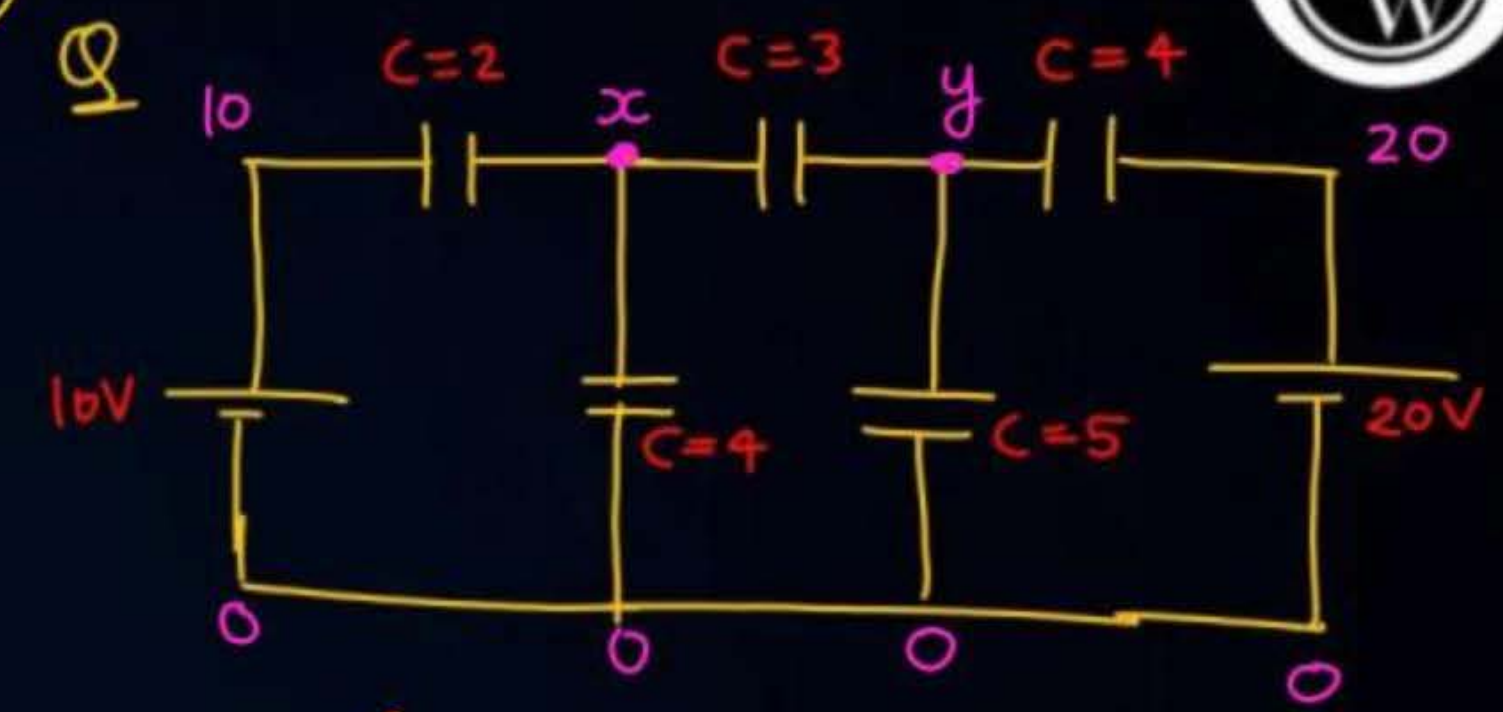
C = 2F (each)



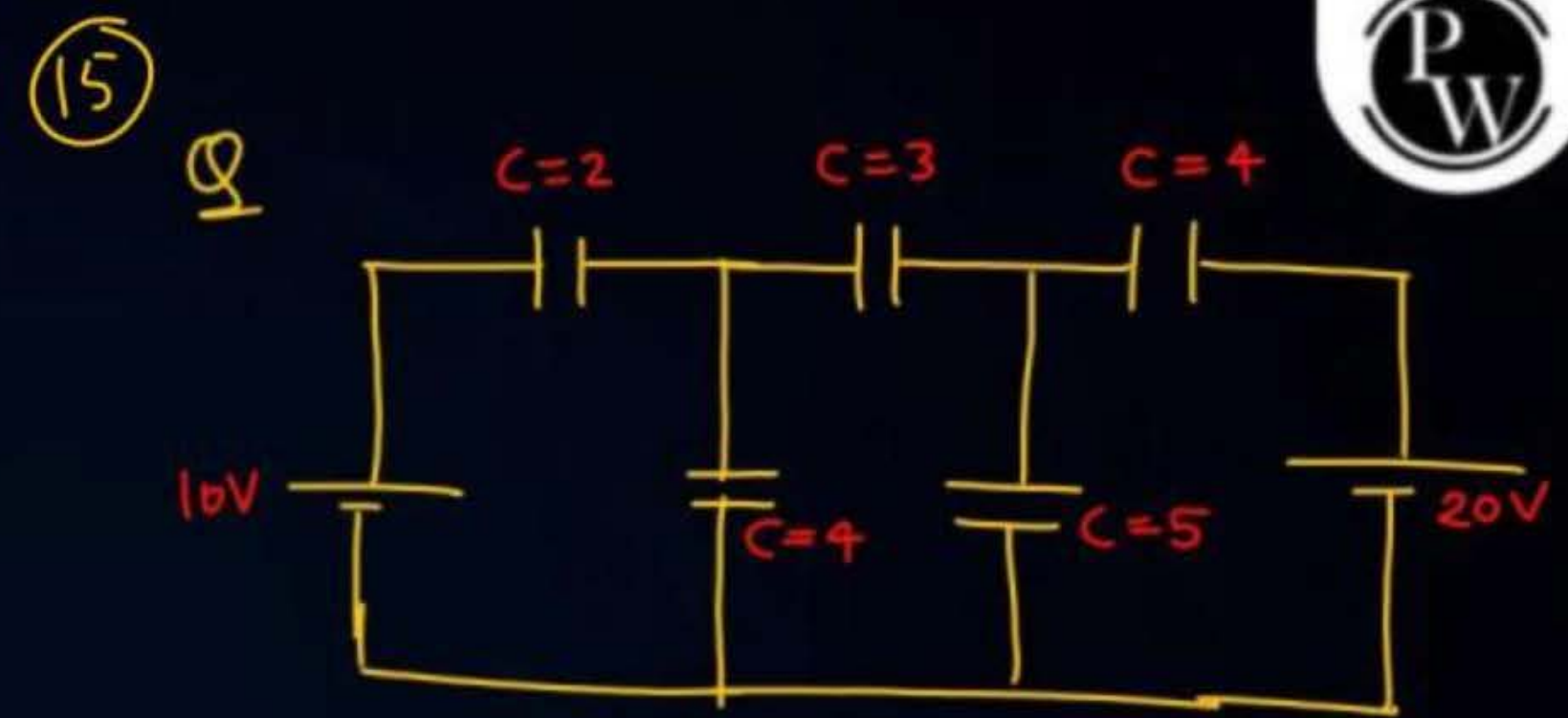
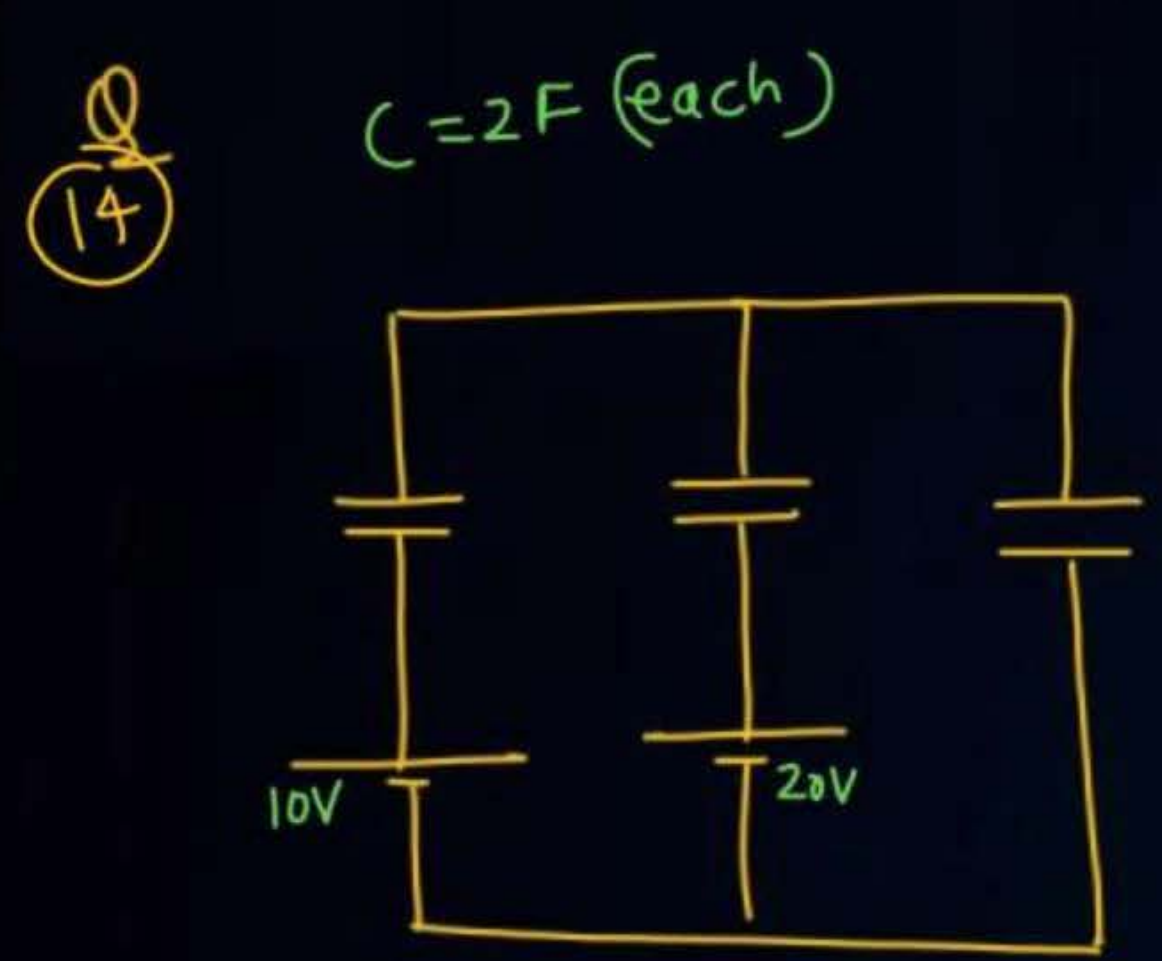
$$(x-10)^2 + (x-20)^2 + (x-0) \times 2 = 0$$

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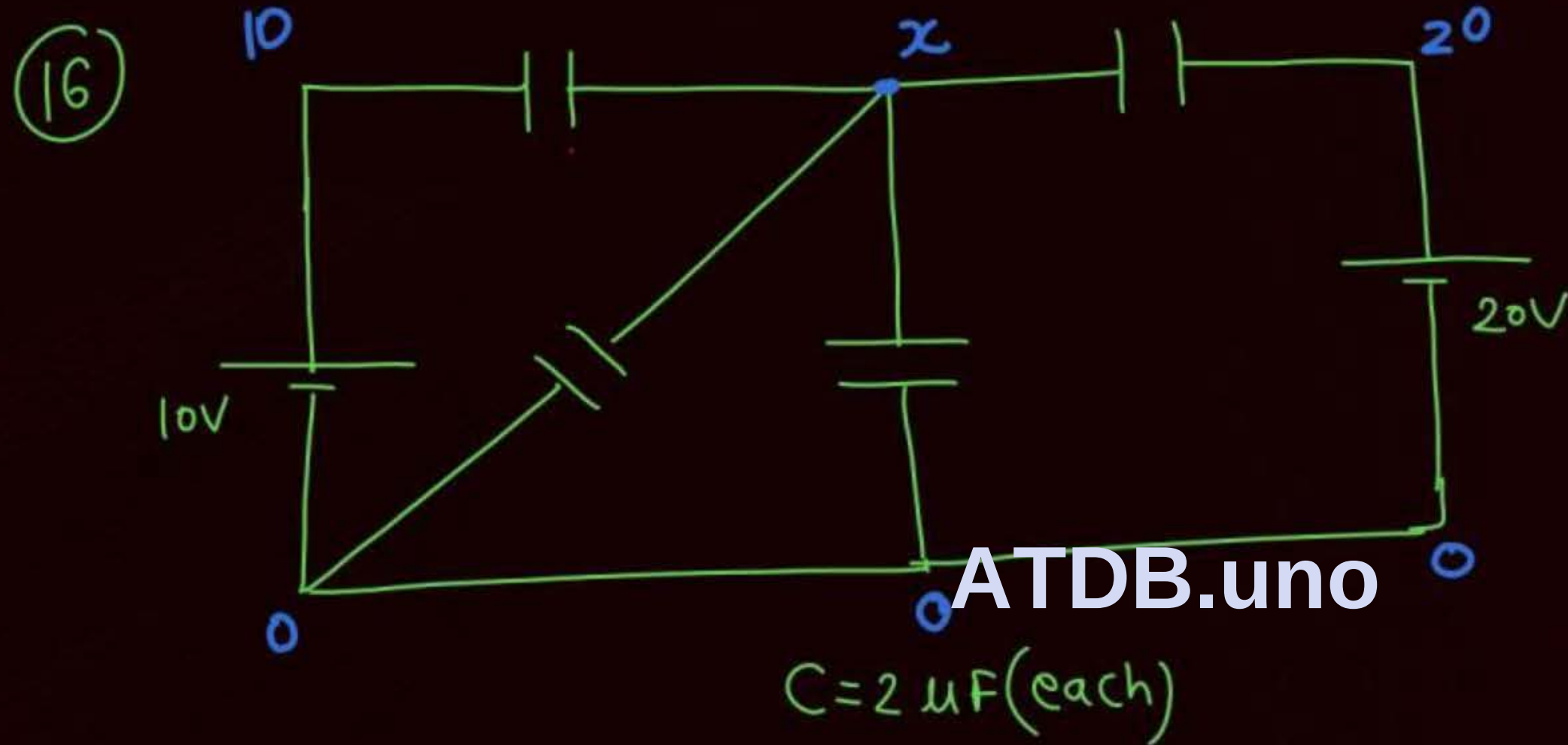
Q



$$(x-10)^2 + (x-0)^4 + (x-y) \times 3 = 0$$
$$(y-x) \times 3 + (y-0) \times 5 + (y-20) \times 4 = 0$$



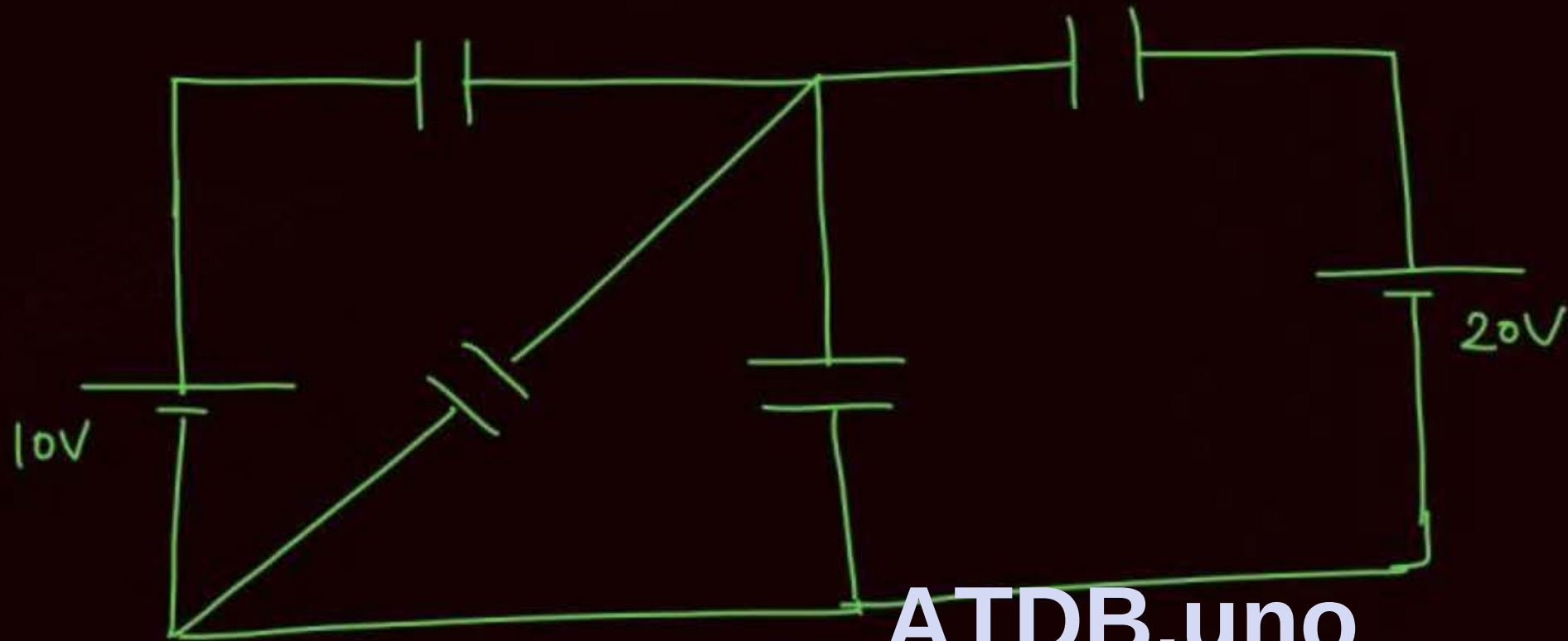
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$$(x - 10)^2 + (x - 0)^2 + (x - 0)^2 + (10 - 20)^2 = 0$$



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$C = 2\mu F(\text{each})$



THANK YOU

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