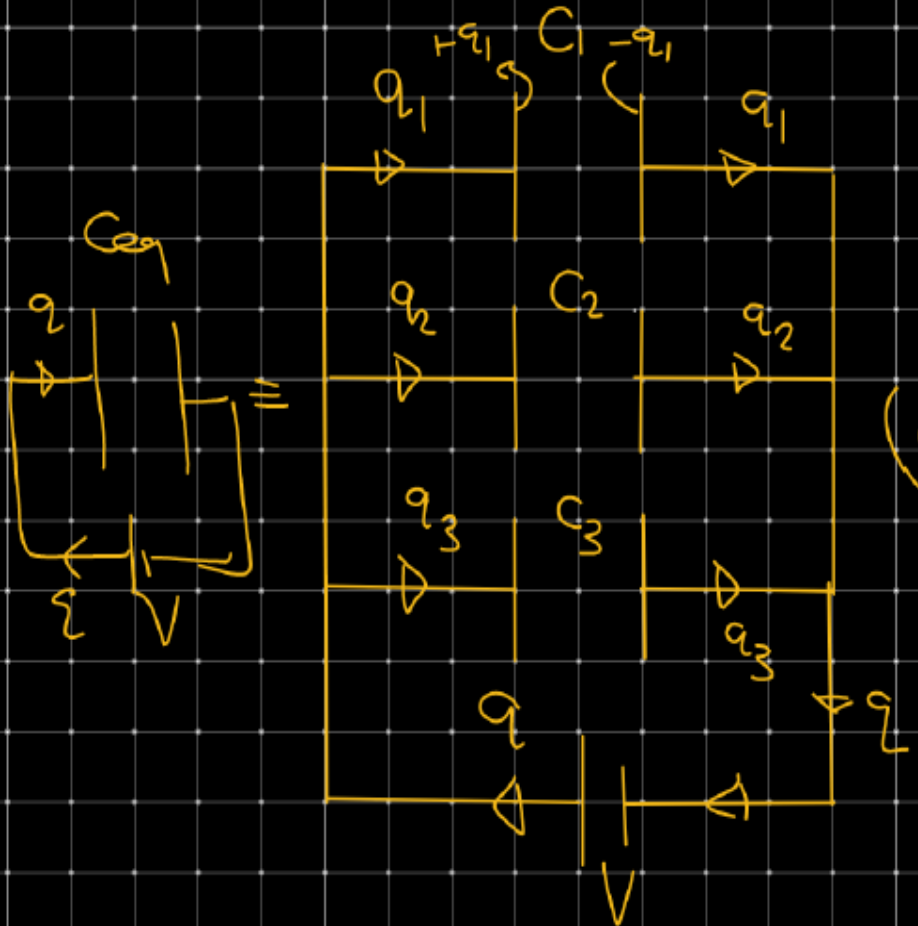
(#) Parallel Connection of Capacitors:

↳ Potential across each capacitor is same.



$$q = q_1 + q_2 + q_3$$

$$C_{eq} V = C_1 V + C_2 V + C_3 V$$

$$(C_{eq}) V = (C_1 + C_2 + C_3) V$$

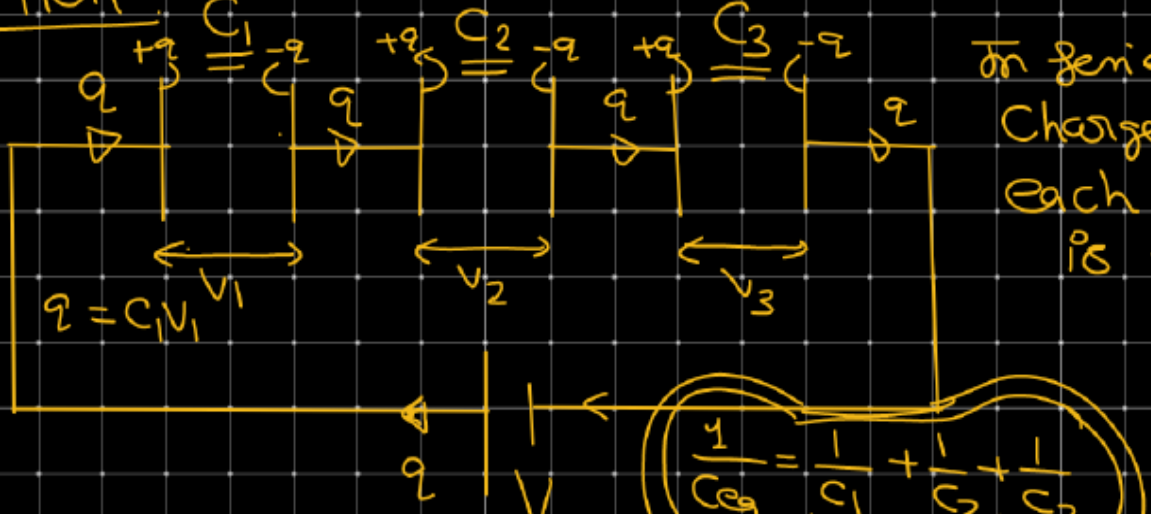
$$\boxed{C_{eq} = C_1 + C_2 + C_3}$$

Series connection :-

C_{eq} $q = C_{eq} \cdot V$

$V = \frac{q}{C_{eq}}$

$\equiv$



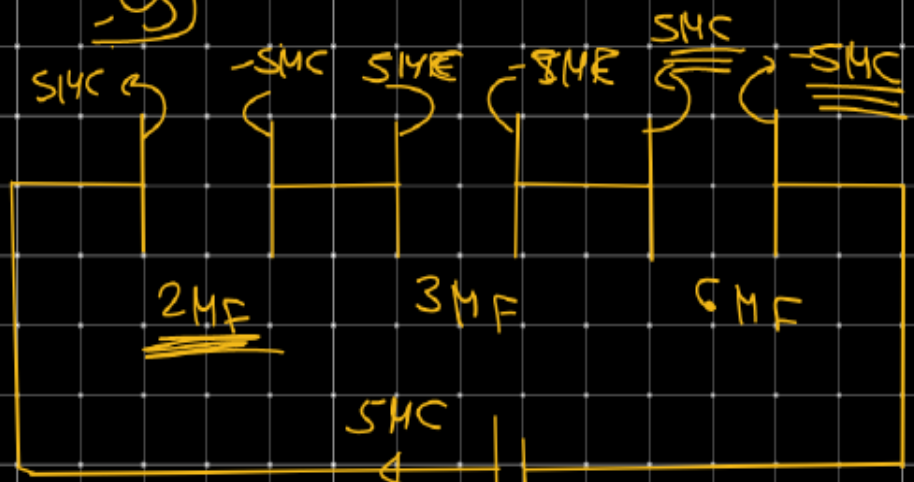
In series connection Charge flow on each capacitor is same.

$$\frac{1}{C_{eq}} = \frac{1}{C_1} + \frac{1}{C_2} + \frac{1}{C_3}$$

$$V = V_1 + V_2 + V_3$$

$$\frac{q}{C_{eq}} = \frac{q}{C_1} + \frac{q}{C_2} + \frac{q}{C_3} \Rightarrow q\left(\frac{1}{C_{eq}}\right) = \left(\frac{1}{C_1} + \frac{1}{C_2} + \frac{1}{C_3}\right) q$$

8)



$Q = CV$

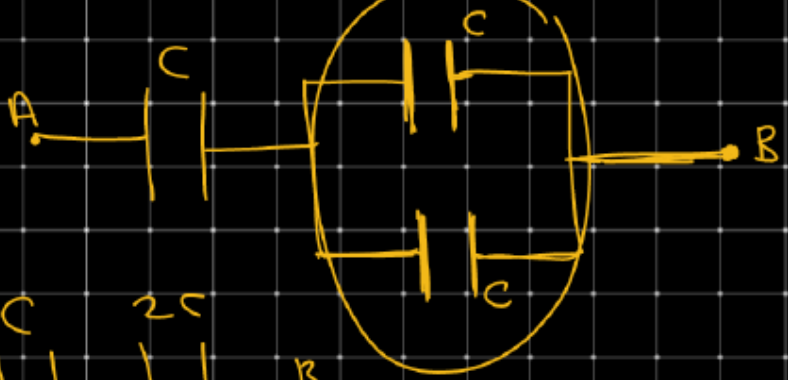
$5MC = 1MF \times 5V$

$= 5MC$

(a) Find Ceq. (b) Charge flow through the battery

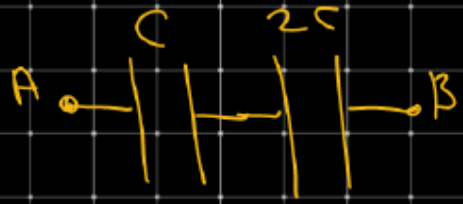
(c) Charge on each capacitor

$Ceq = 1MF$

Q) 

Ceq b/w A & B.

$$C_{eq} = \frac{2C}{3}$$



Parallel

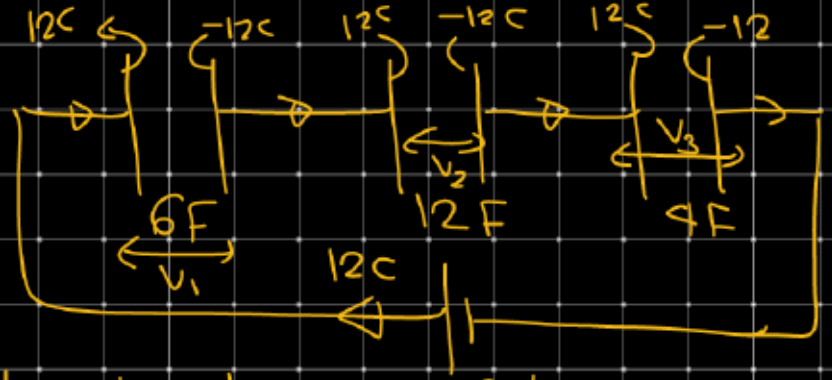
$$C_{eq} = C_1 + C_2$$
$$= C + C = 2C$$

$$\frac{1}{C_{eq}} = \frac{1}{C_1} + \frac{1}{C_2}$$

$$\frac{1}{C_{eq}} = \frac{1}{C} + \frac{1}{2C} = \frac{2+1}{2C}$$

$$\frac{1}{C_{eq}} = \frac{3}{2C} \Rightarrow C_{eq} = \frac{2C}{3}$$

8) Find charges & Potential across each capacitor.



Step1) Ceq.

Step2) Charge flow through battery

$\frac{1}{C_{eq}} = \frac{1}{6} + \frac{1}{12} + \frac{1}{4}$

$\frac{1}{C_{eq}} = \frac{2+1+3}{12} = \frac{6}{12}$

$C_{eq} = 2F$

$Q = C_{eq} \cdot V$

$= 2 \times V = 12C$

$Q_1 = C_1 V_1$

$12 = 6 V_1$

$V_1 = 2\,Volt$

$V_1 + V_2 + V_3 = V$

$2 + 1 + 3 = 6 V_{olt}$

$12 = 12 \times V_2$

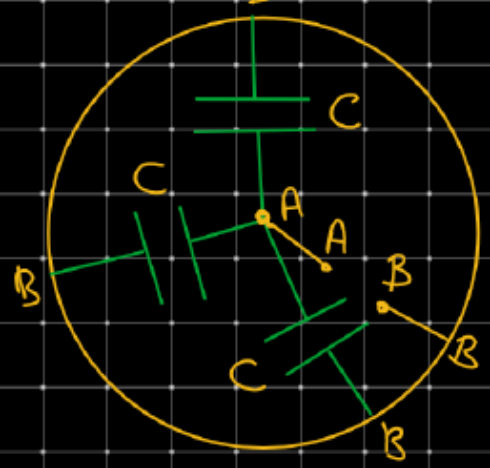
$V_2 = 1 V_{olt}$

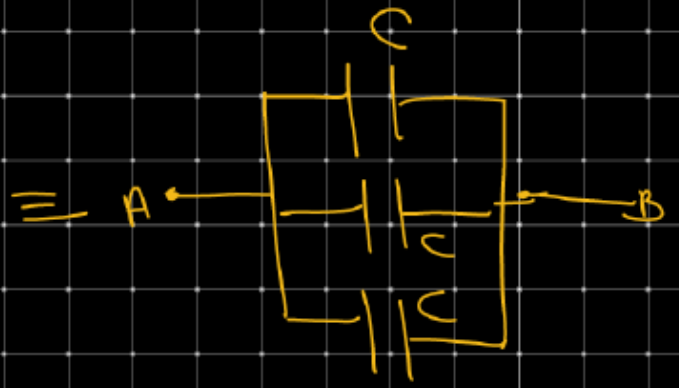
$12 = C_3 V_3$

$12 = 4 V_3$

$V_3 = 3\,Volt$

9) Find C_{eq} b/w A & B



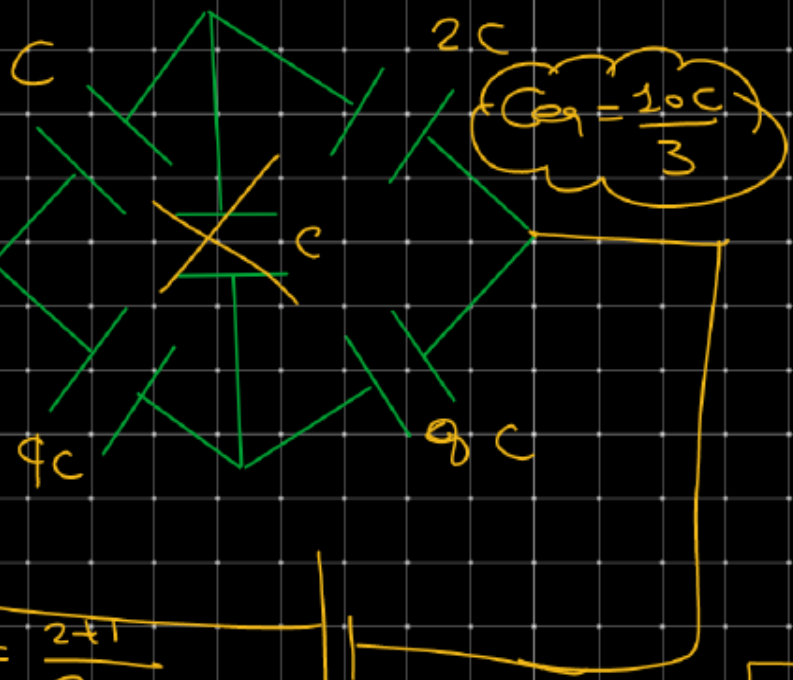


$C_{eq} = C_1 + C_2 + C_3$

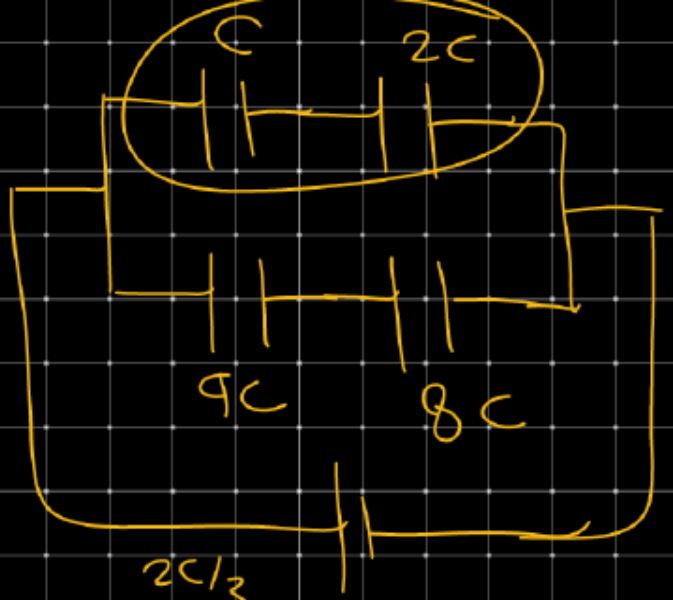
$\boxed{C_{eq} = 3C}$

WSB:

Find C_{eq} =



$C_{eq} = \frac{10C}{3}$

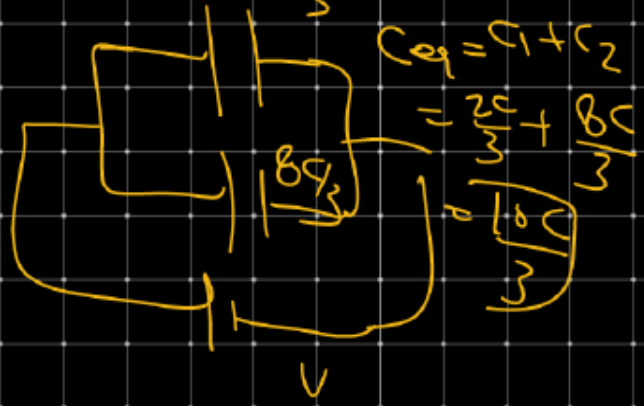


$\frac{1}{C_{eq}} = \frac{1}{C} + \frac{1}{2C} = \frac{2+1}{2C}$

$C_{eq} = \frac{2C}{3}$

$\frac{1}{C_{eq}} = \frac{1}{8C} + \frac{1}{4C} = \frac{1+2}{8C}$

$C_{eq} = \frac{8C}{3}$



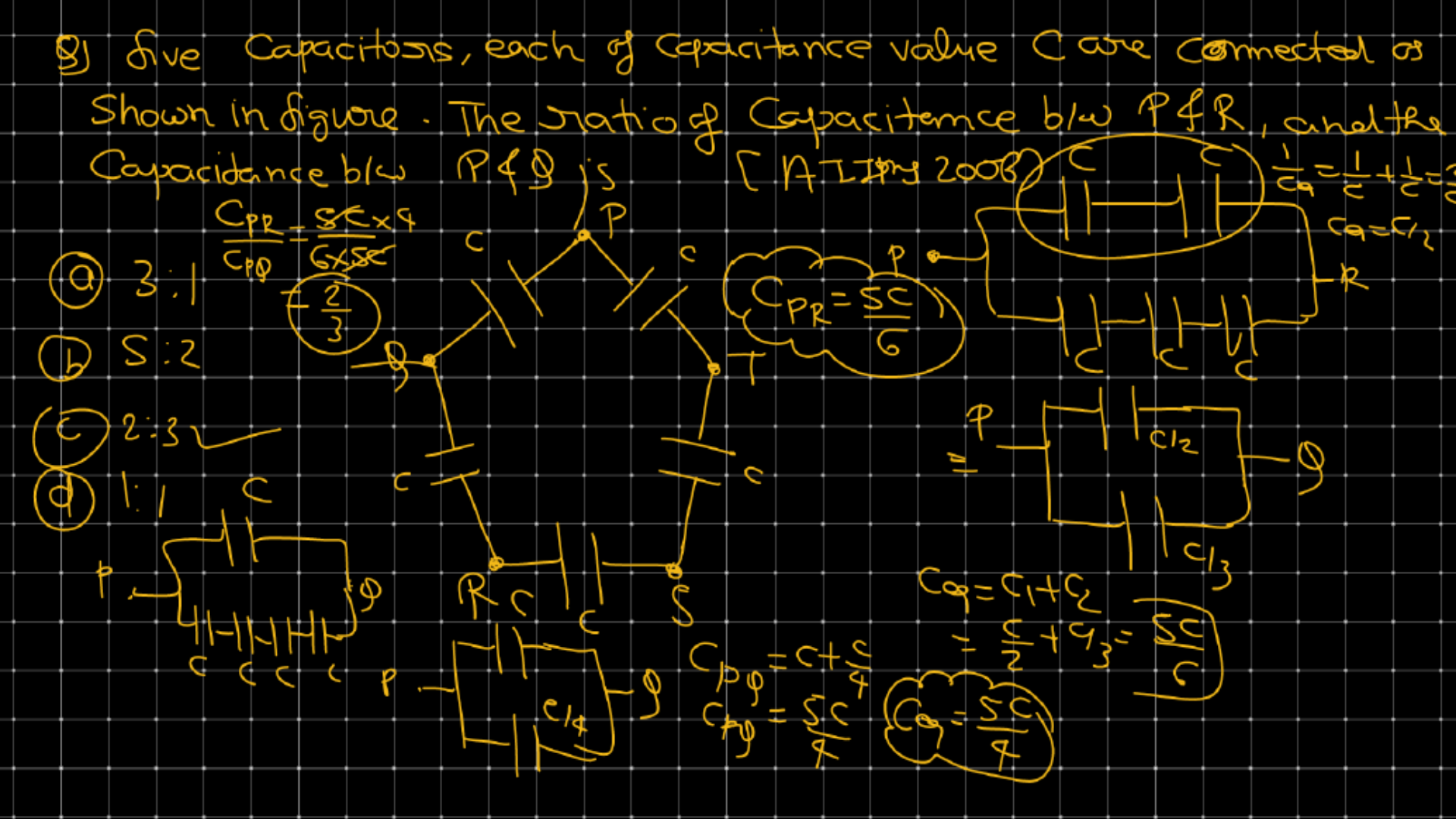
$C_{eq} = C_1 + C_2$

$= \frac{2C}{3} + \frac{8C}{3}$

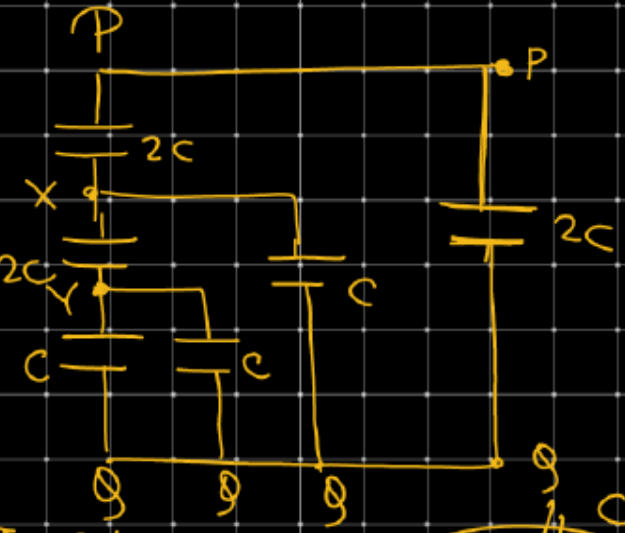
$= \frac{10C}{3}$

9) five Capacitors, each of capacitance value C are connected as shown in figure. The ratio of Capacitance b/w P & R, and the Capacitance b/w P & Q is [AIIMS 2008]

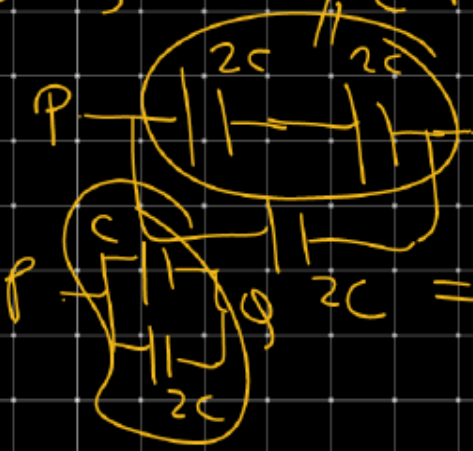
(a) 3:1
(b) 5:2
(c) 2:3
(d) 1:1

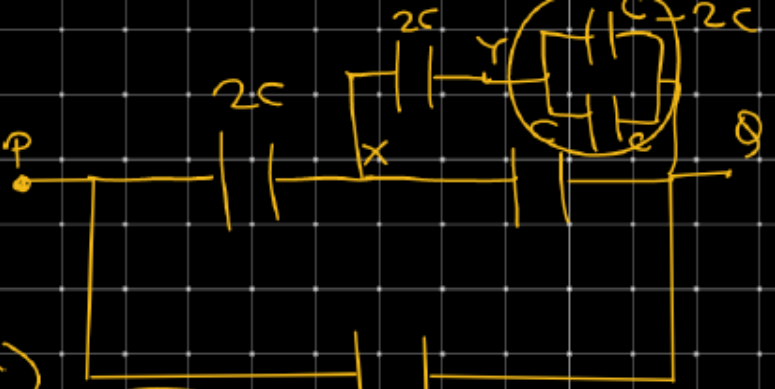


9) Ceq b/w P & Q.



(a) C/3
(b) C
(c) 3C
(d) 2C

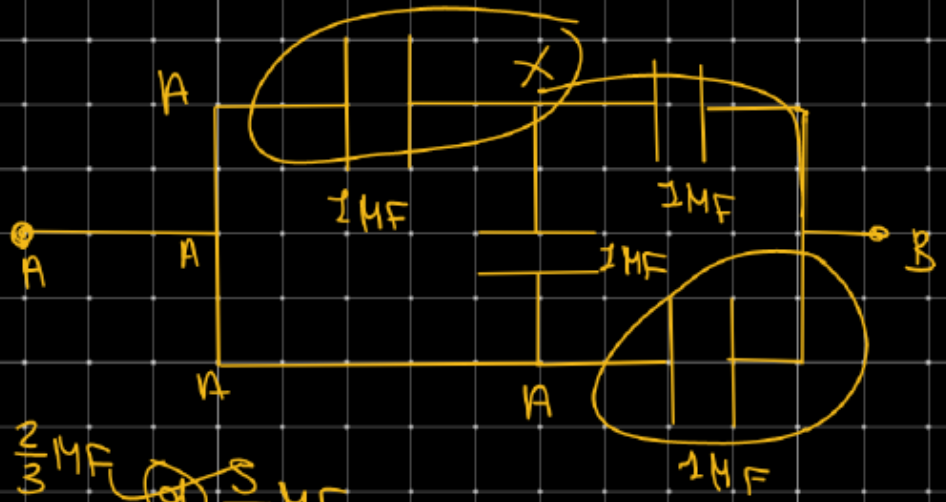




$\frac{1}{C_{eq}} = \frac{1}{2C} + \frac{1}{2C} = \frac{2}{2C}$

$C_{eq} = C$

Ceq b/w A & B.



(a) $\frac{2}{3}$MF (d) $\frac{5}{3}$MF

(b) $\frac{7}{3}$MF

(c) $\frac{8}{3}$MF

$$\frac{1}{C_{eq}} = \frac{1}{2} + \frac{1}{1} = \frac{3}{2}$$

$$C_{eq} = \frac{2}{3}\text{MF}$$

$$C_{eq} = C_1 + C_2 = 1 + \frac{2}{3} = \frac{5}{3}\text{MF}$$