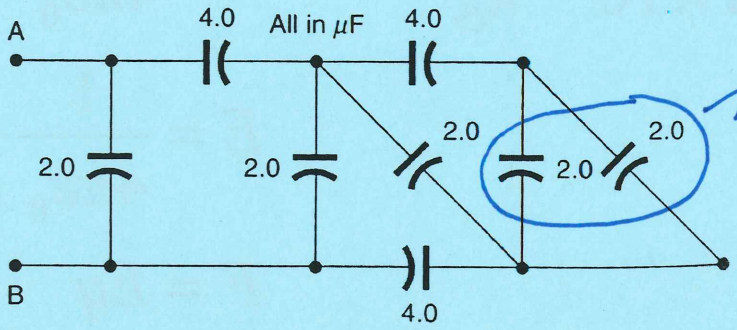
PHYS 2212
Principles of Physics II
Quiz 4

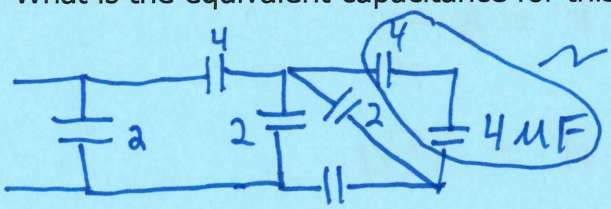
Name Charles John

Show all work in the spaces provided.

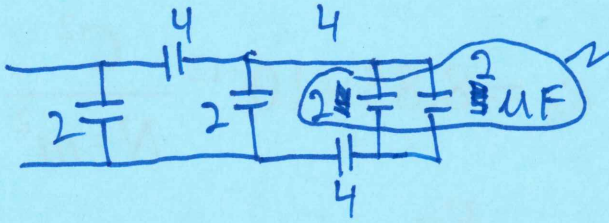


Par. 2μF + 2μF = 4μF

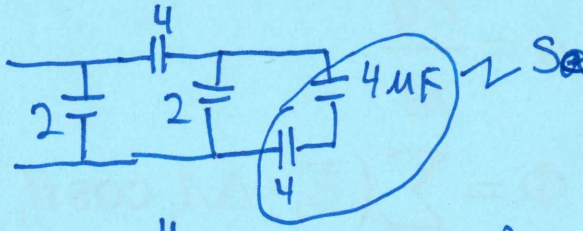
1) What is the equivalent capacitance for this collection? (10 pts)



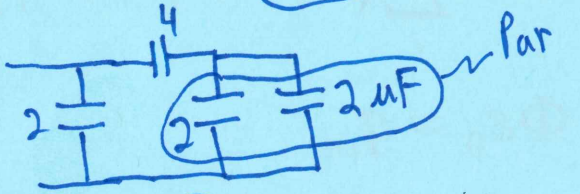
Ser. $\frac{1}{4\mu F} + \frac{1}{4\mu F} = \frac{2}{4\mu F} \Rightarrow 2\mu F$



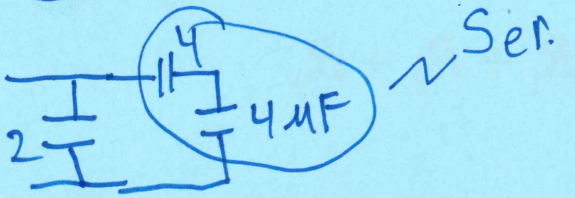
Par. 2μF + 2μF = 4μF



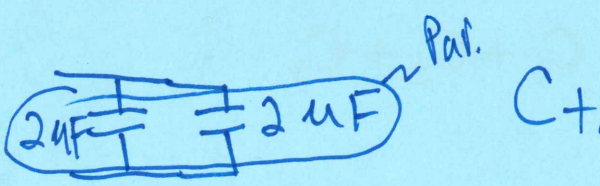
Ser $\frac{1}{4\mu F} + \frac{1}{4\mu F} = \frac{2}{4\mu F} \Rightarrow 2\mu F$



Par ⇒ 4μF



Ser. ⇒ 2μF

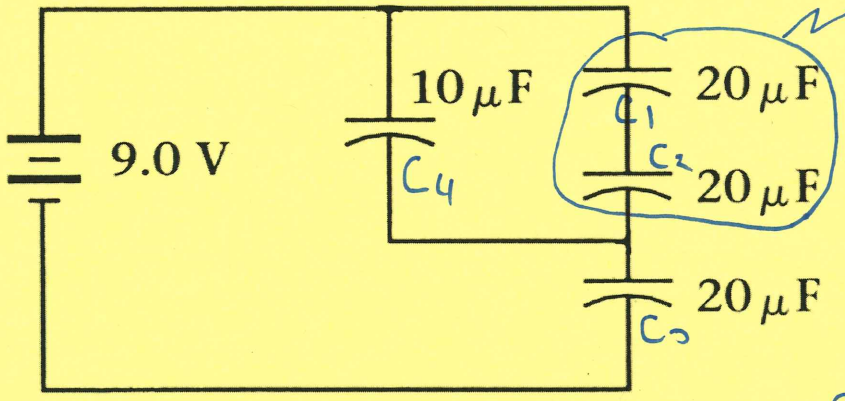


Par. $C_{tot} \Rightarrow 4\mu F$

PHYS 1112
Introductory Physics II
Quiz 4

Name Charles Johnson

Show all work in the spaces provided.



$\frac{1}{C_{12}} = \frac{1}{C_1} + \frac{1}{C_2}$

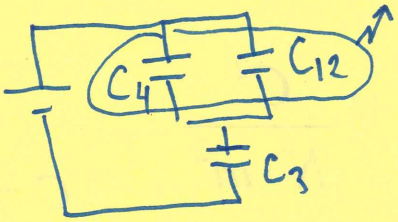
$\frac{1}{C_{12}} = \frac{1}{20\mu F} + \frac{1}{20\mu F}$

$\frac{1}{C_{12}} = \frac{2}{20\mu F}$

$C_{12} = 10\mu F$

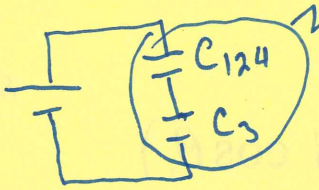
1) For the above capacitors find:

a) The equivalent capacitance. (5 pts)



$C_{124} = C_{12} + C_4$

$C_{124} = 20\mu F$



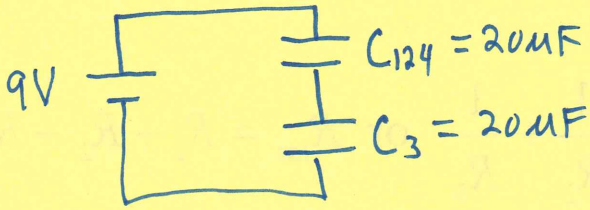
$\frac{1}{C_{tot}} = \frac{1}{C_{124}} + \frac{1}{C_3}$

$\frac{1}{C_{tot}} = \frac{1}{20\mu F} + \frac{1}{20\mu F}$

$\frac{1}{C_{tot}} = \frac{2}{20\mu F}$

$C_{tot} = 10\mu F$

b) The charge on the *10 μF* capacitor. (C_4) (5 pts)



Series same q $q_3 = q_{124} = q_{tot} = C_{tot} V_{tot}$

$= (10\mu F)(9V)$

$= 90\mu C$

so $V_{124} = \frac{q_{124}}{C_{124}} = \frac{90\mu C}{20\mu F}$

$V_{124} = 4.5V$

since C_4 and C_{12} are parallel

$V_4 = V_{124} = 4.5V$

so $q_4 = C_4 V_4 = 45\mu C$