

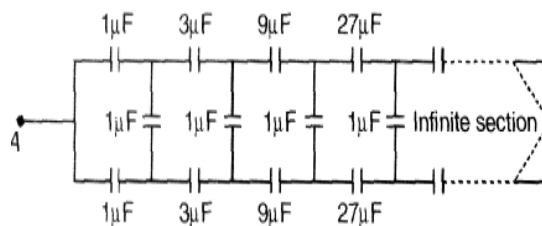
DPP – 2 (Capacitor)

Video Solution on Website :- <https://physicsaholics.com/home/courseDetails/103>

Video Solution on YouTube:- https://youtu.be/0C-wN30Uf_8

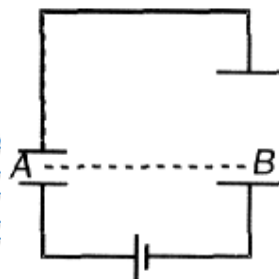
Written Solution on Website:- <https://physicsaholics.com/note/notesDetails/63>

Q 1. What is equivalent capacitance of circuit between points A and B?



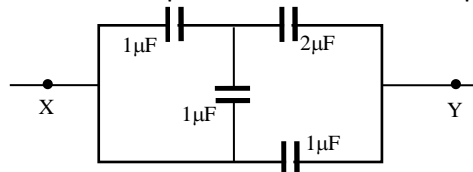
- (a) $2/3 \mu\text{F}$
- (b) $4/3 \mu\text{F}$
- (c) Infinite
- (d) $(1 + \sqrt{3}) \mu\text{F}$

Q 2. Two parallel plate capacitors with same area of cross-section but different distance between plates are connected as shown in figure.



- (a) $E_A > E_B$
- (b) $E_A = E_B$
- (c) $V_A > V_B$
- (d) $V_A < V_B$

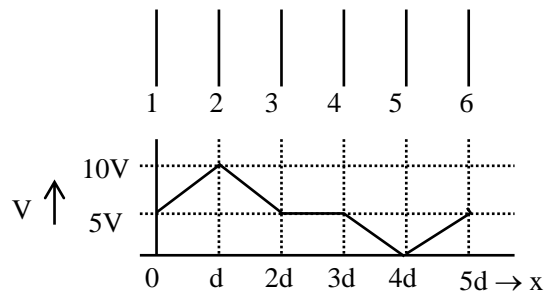
Q 3. The figure shows a circuit of four capacitors. The effective capacitance between X and Y is



- (a) $2 \mu\text{F}$
- (b) $1 \mu\text{F}$
- (c) $3 \mu\text{F}$
- (d) $1.5 \mu\text{F}$

Passage (Q.4 TO Q.6)

The V versus x plot for six identical metal plates of cross-sectioned area A is shown. The plates are placed with separation d



Q 4. Equivalent capacitance between 2 & 5 is-

- (A) $\frac{2\epsilon_0 A}{d}$ (B) $\frac{\epsilon_0 A}{d}$
 (C) $\frac{3\epsilon_0 A}{d}$ (D) $\frac{4\epsilon_0 A}{d}$

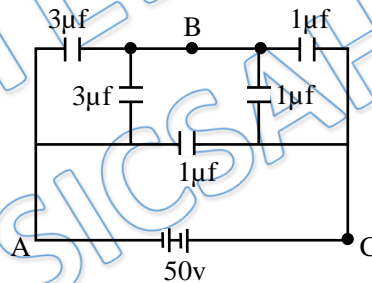
Q 5. Total charge on plate 2 is -

- (a) $\frac{10\epsilon_0 A}{d}$ (b) $\frac{5\epsilon_0 A}{3d}$
 (c) $\frac{4\epsilon_0 A}{3d}$ (d) None of these

Q 6. Ratio of charge on plate 2 to plate 5 is $|Q_2 : Q_5|$ is -

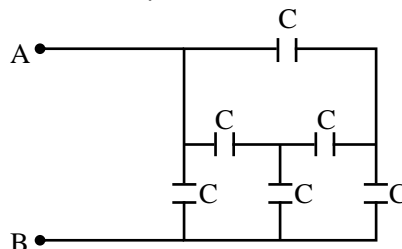
- (a) 2 : 1 (b) 3 : 1
 (c) 1 : 1 (d) None of these

Q 7. In the circuit diagram shown below :



- (a) The effective capacity between A and C is $\frac{3}{2}\mu\text{f}$
 (b) The effective capacity between A and C is $\frac{5}{2}\mu\text{f}$
 (c) The potential difference between A and B in steady state is $\frac{75}{2}$ volt
 (d) The potential difference between B and C in steady state is $\frac{75}{2}$ volt

Q 8. The equivalent capacitance between point A and B is -

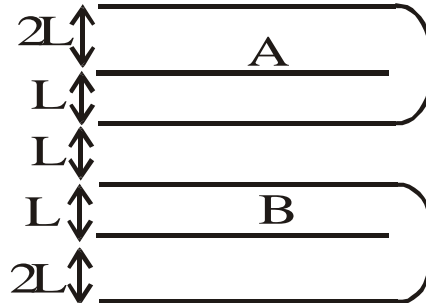


- (a) $C/4$ (b) $C/2$

(c) C

(d) 2C

- Q 9. In the arrangement shown, all plates have equal area. The amount of spacing between plates is mentioned. Find the equivalent capacitance of the system between A and B if $C = \frac{\epsilon_0 A}{L}$



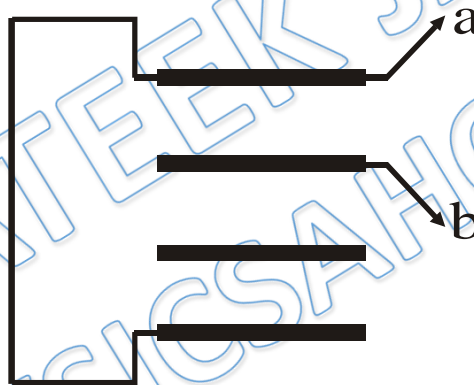
(A) $5C/7$

(B) $3C/7$

(C) $C/7$

(D) None of the above

- Q 10. Four metallic plates each with a surface area of one side A are placed at a distance d from each other. The plates are connected as shown in the circuit diagram. Then the capacitance of the system between a and b is



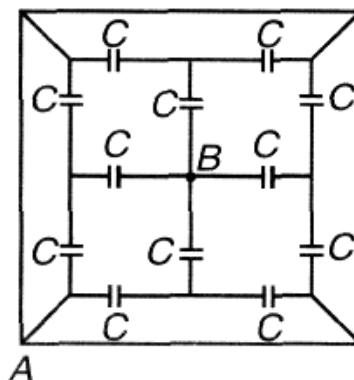
(a) $\frac{3\epsilon_0 A}{d}$

(b) $\frac{2\epsilon_0 A}{d}$

(c) $\frac{2\epsilon_0 A}{3d}$

(d) $\frac{3\epsilon_0 A}{2d}$

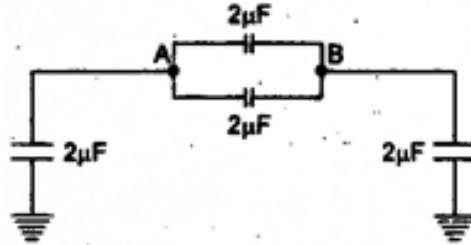
- Q 11. Equivalent capacitance between A and B is





- (a) $4C/3$
- (b) $8C/3$
- (c) $12C$
- (d) $5C/12$

Q 12. Find equivalent capacitance between A and B



- (a) $5 \mu\text{F}$
- (b) $4 \mu\text{F}$
- (c) $3 \mu\text{F}$
- (d) $2 \mu\text{F}$

PRATEEK JAIN
PHYSICSAHOLICS

Answer Key

Q.1 b	Q.2 b, c	Q.3 a	Q.4 b	Q.5 a
Q.6 c	Q.7 b, d	Q.8 d	Q.9 b	Q.10 d
Q.11 b	Q.12 a			

PLUS **ICONIC****

- ✓ India's Best Educators
- ✓ Interactive Live Classes
- ✓ Structured Courses & PDFs
- ✓ Live Tests & Quizzes
- ✗ Personal Coach
- ✗ Study Planner

24 months ₹2,333/mo >
No cost EMI ₹56,000

18 months ₹2,625/mo >
No cost EMI ₹47,250

12 months ₹3,208/mo >
No cost EMI ₹38,500

6 months ₹4,667/mo >
No cost EMI ₹28,000

To be paid as a one-time payment

[View all plans](#)



Add a referral code

APPLY

PHYSICSLIVE

Use code **PHYSICSLIVE** to get 10% OFF on Unacademy PLUS.

PLUS **ICONIC****

- ✓ India's Best Educators
- ✓ Interactive Live Classes
- ✓ Structured Courses & PDFs
- ✓ Live Tests & Quizzes
- ✗ Personal Coach
- ✗ Study Planner

24 months ₹2,100/mo >
No cost EMI **+10% OFF** ₹50,400

18 months ₹2,363/mo >
No cost EMI **+10% OFF** ₹42,525

12 months ₹2,888/mo >
No cost EMI **+10% OFF** ₹34,650

6 months ₹4,200/mo >
No cost EMI **+10% OFF** ₹25,200

To be paid as a one-time payment

[View all plans](#)



Awesome! **PHYSICSLIVE** code applied



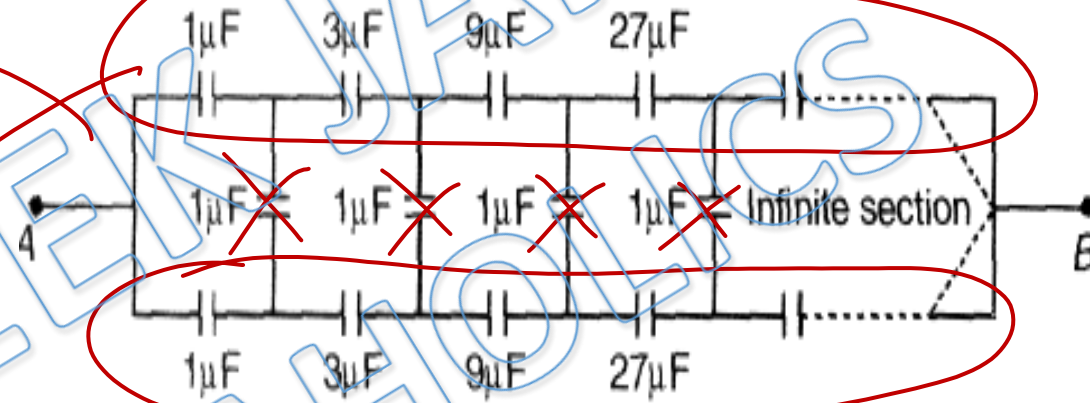
Written Solution

**DPP 2 – Capacitor : Combination of Series
and Parallel Capacitor, Wheat Stone Bridge**

By Physicsaholics Team

(Q.1) What is equivalent capacitance of circuit between points A and B?

extended wheat stone
bridge



(a) $2/3 \mu F$

~~(b) $4/3 \mu F$~~

(c) Infinite

(d) $(1 + \sqrt{3}) \mu F$

$$\frac{1}{C} = \frac{1}{1} + \frac{1}{3} + \frac{1}{9} + \dots = \frac{1}{1 - 1/3} = 3/2.$$

$$C = 2/3 \mu F$$

$$C_{\text{eff}} = C + C = 4/3 \mu F$$

(Q.2) Two parallel plate capacitors with same area of cross-section but different distance between plates are connected as shown in figure.

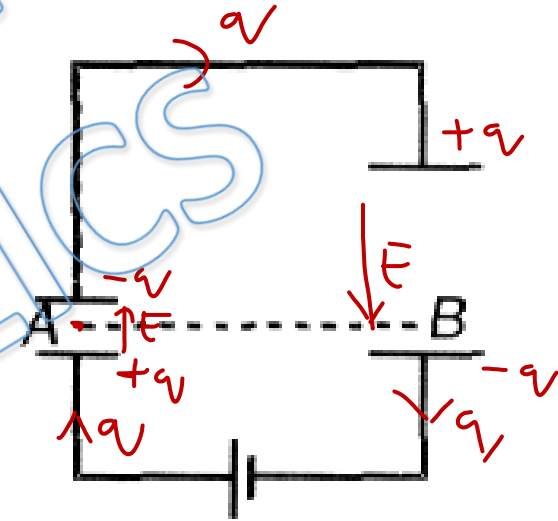
$$E = \frac{q}{A\epsilon_0} \Rightarrow E_A = E_B$$

(a) $E_A > E_B$

(c) $V_A > V_B$

(b) $E_A = E_B$

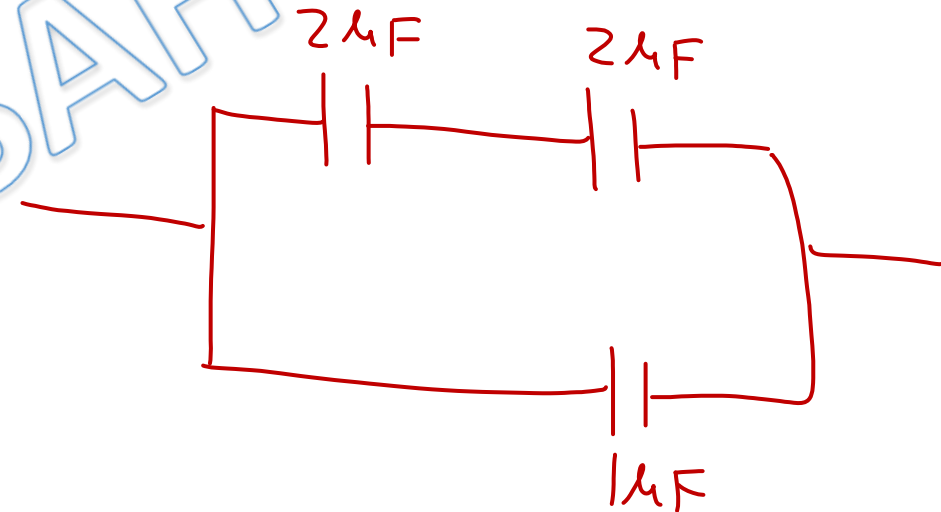
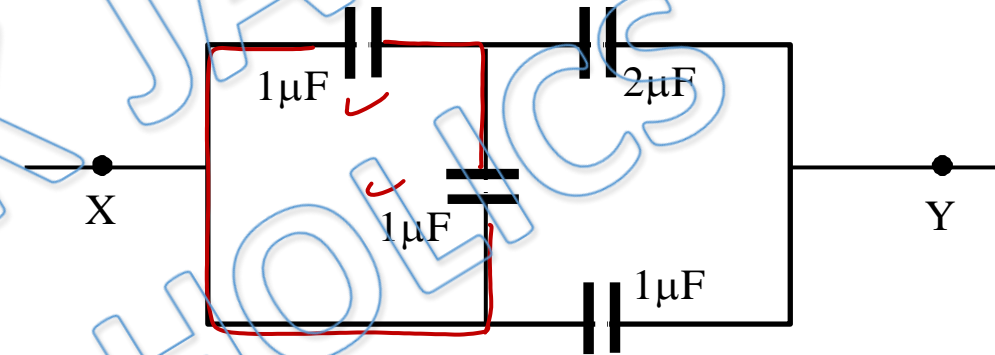
(d) $V_A < V_B$



(Q.3) The figure shows a circuit of four capacitors. The effective capacitance between X and Y is

- ~~(a) $2 \mu\text{F}$~~
- (c) $3 \mu\text{F}$

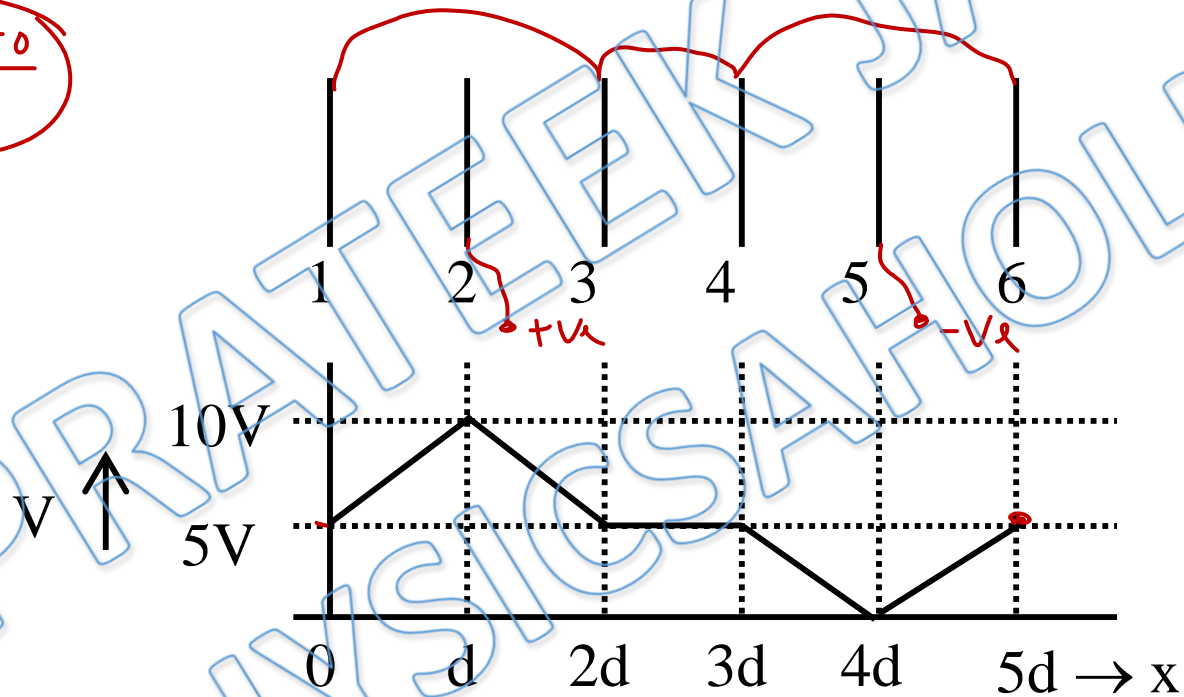
- (b) $1 \mu\text{F}$
- (d) $1.5 \mu\text{F}$



Passage(Q.4 TO Q.6)

The V versus x plot for six identical metal plates of cross-sectioned area A is shown. The plates are placed with separation d

$$C = \frac{A\epsilon_0}{d}$$



(Q.4) Equivalent capacitance between 2 & 5 is-

C_{12} is parallel to C_{23}
 C_{45} " " " C_{56}

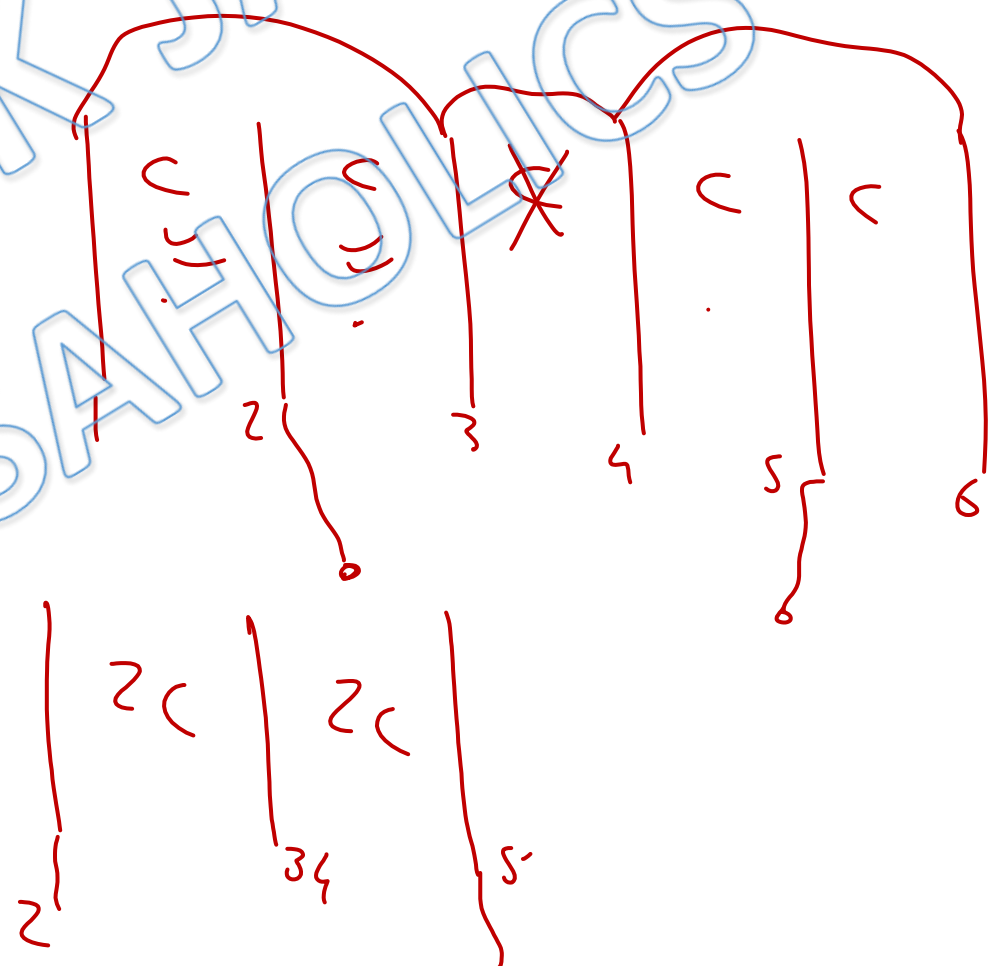
(A) $\frac{2\epsilon_0 A}{d}$

~~(B) $\frac{\epsilon_0 A}{d}$~~

(C) $\frac{3\epsilon_0 A}{d}$

(D) $\frac{4\epsilon_0 A}{d}$

$C_{\text{eff}} = C = \frac{A\epsilon_0}{d}$



(Q.5) Total charge on plate 2 is -

$$q = CV \\ = \frac{A\epsilon_0}{d} \times 10$$

(a) $\frac{10\epsilon_0 A}{d}$

(b) $\frac{5\epsilon_0 A}{3d}$

(c) $\frac{4\epsilon_0 A}{3d}$

(d) None of these

(Q.6) Ratio of charge on plate 2 to plate 5 is $|Q_2:Q_5|$ is -

(a) 2 : 1

(b) 3 : 1

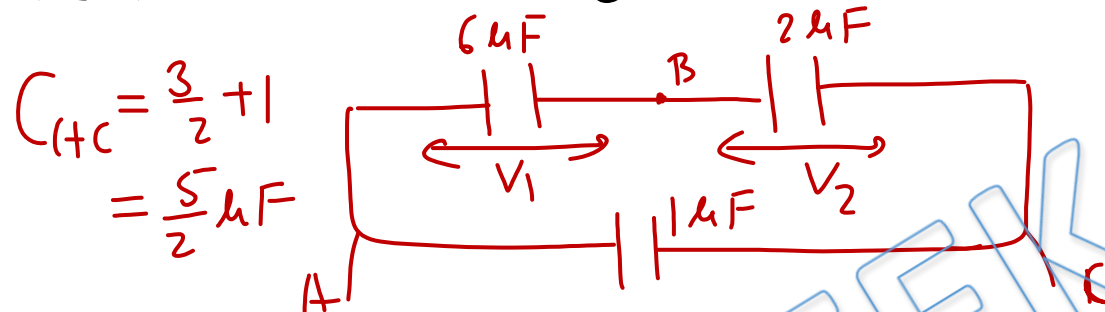
(c) 1 : 1

(d) None of these

PRATEEK JAIN
PHYSICSAHOLICS

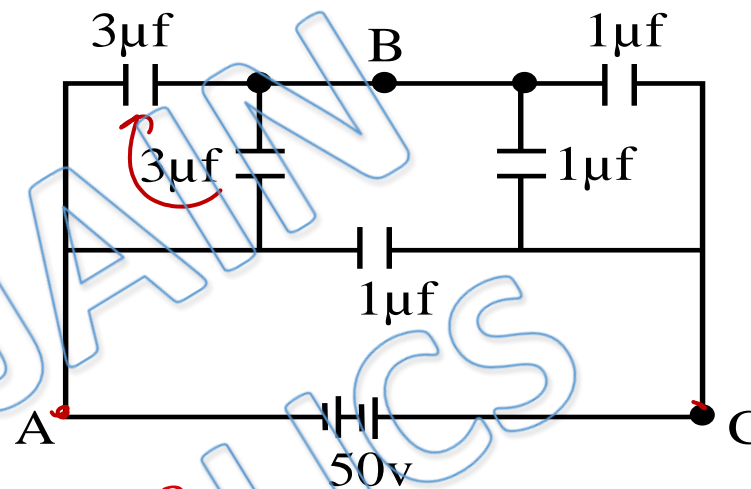
$$\frac{6 \times 2}{8} = \frac{3}{2} \mu F$$

(Q.7) In the circuit diagram shown below :



$$C_{(A-C)} = \frac{3}{2} + 1$$

$$= \frac{5}{2} \mu F$$



(a) The effective capacity between A and C is $\frac{3}{2} \mu f$

$$\frac{V_1}{V_2} = \frac{2}{6} = \frac{1}{3}$$

(b) The effective capacity between A and C is $\frac{5}{2} \mu f$

$$V_1 + V_2 = 50$$

(c) The potential difference between A and B in steady state is $\frac{75}{2}$ volt

(d) The potential difference between B and C in steady state is $\frac{75}{2}$ volt

$$V_2 = \frac{3}{4} \times 50$$

$$= 75 \frac{1}{2} V$$

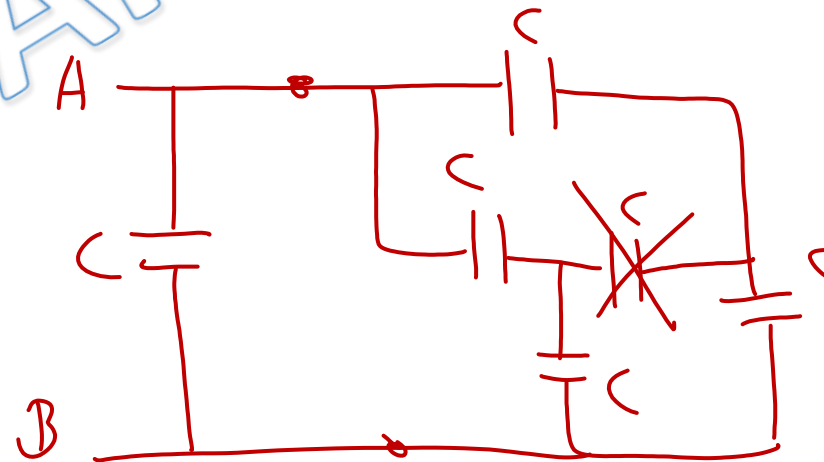
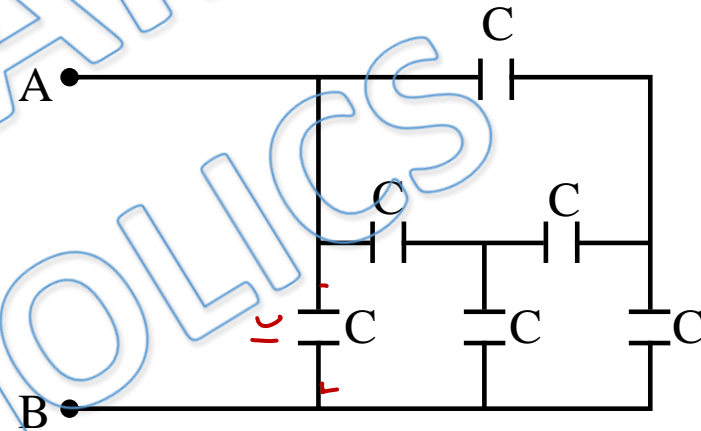
(Q.8) The equivalent capacitance between point A and B is —

(a) $C/4$

(b) $C/2$

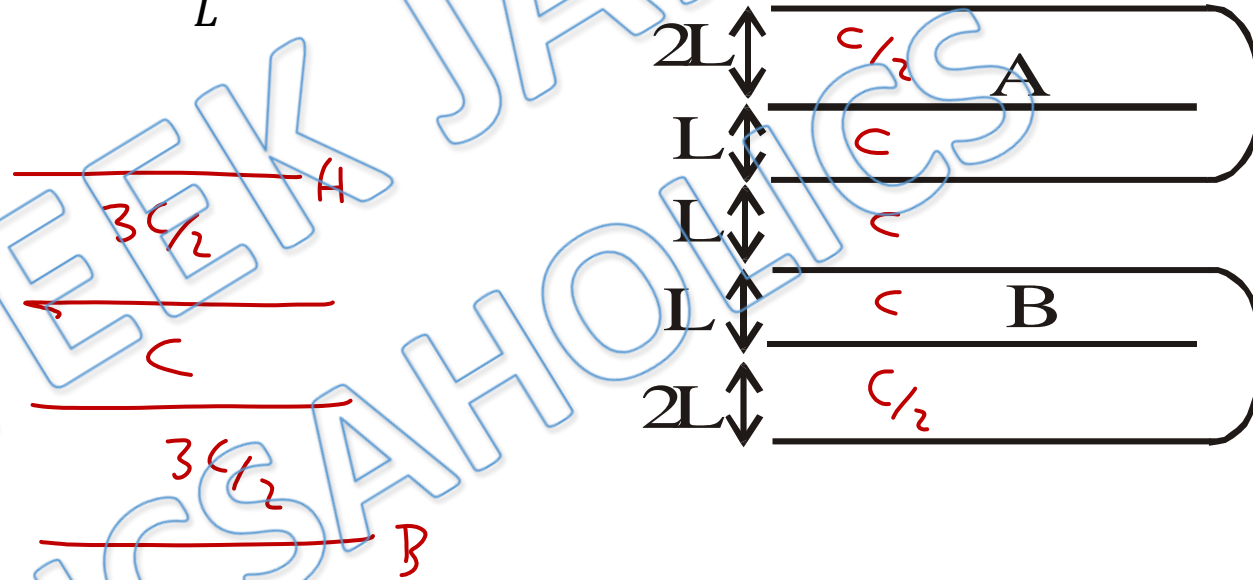
(c) C

~~(d) $2C$~~



(Q.9) In the arrangement shown, all plates have equal area. The amount of spacing between plates is mentioned. Find the equivalent capacitance of the system between A and B if $C = \frac{\epsilon_0 A}{L}$

- (a) $5C/7$
- ~~(b) $3C/7$~~
- (c) $C/7$
- (d) None of the above

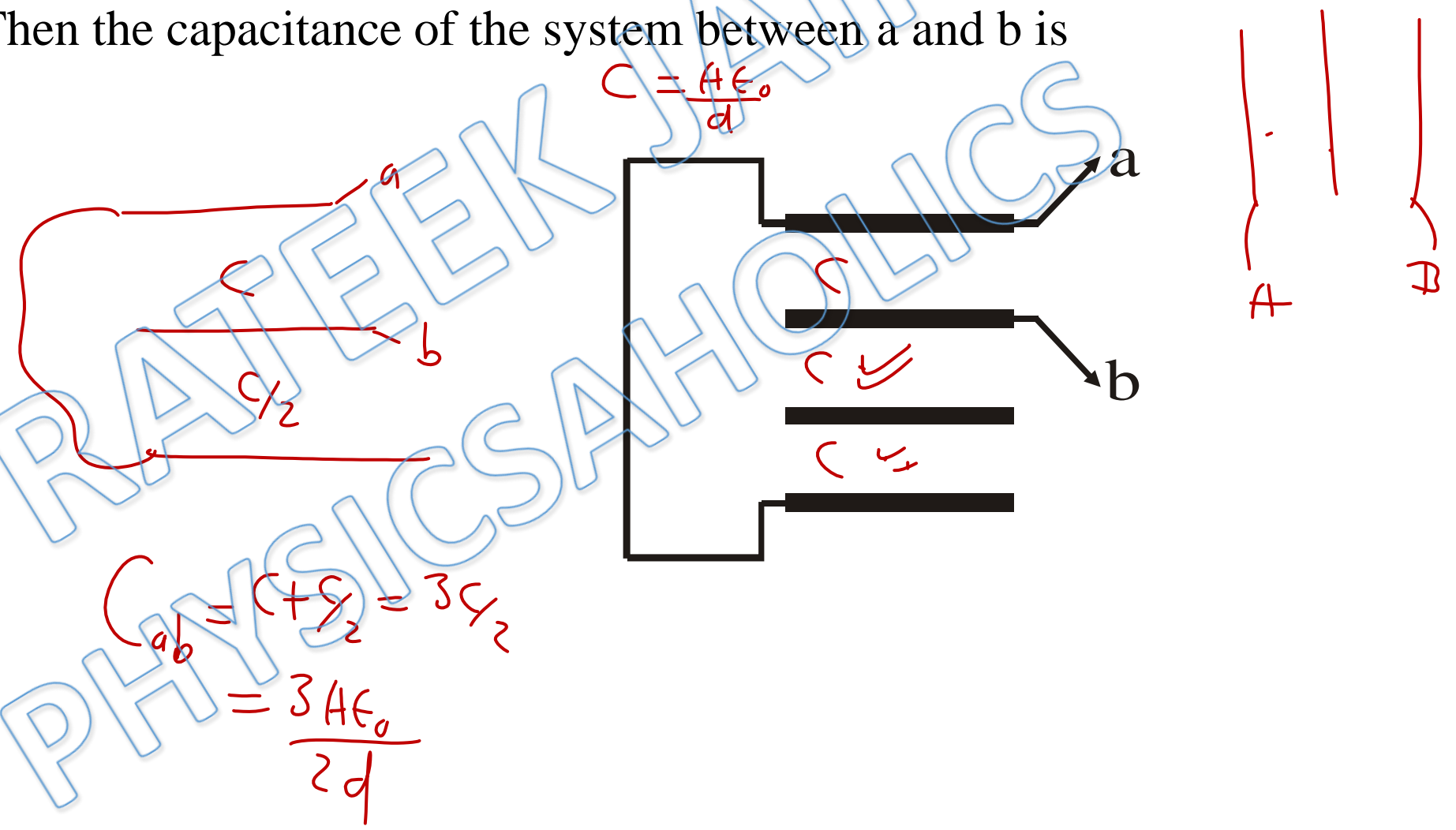


$$\frac{1}{C_{eff}} = \frac{1}{C} + \frac{2}{3C} + \frac{2}{3C} = \frac{3+2+2}{3C} = \frac{7}{3C}$$

$$C_{eff} = \frac{3C}{7}$$

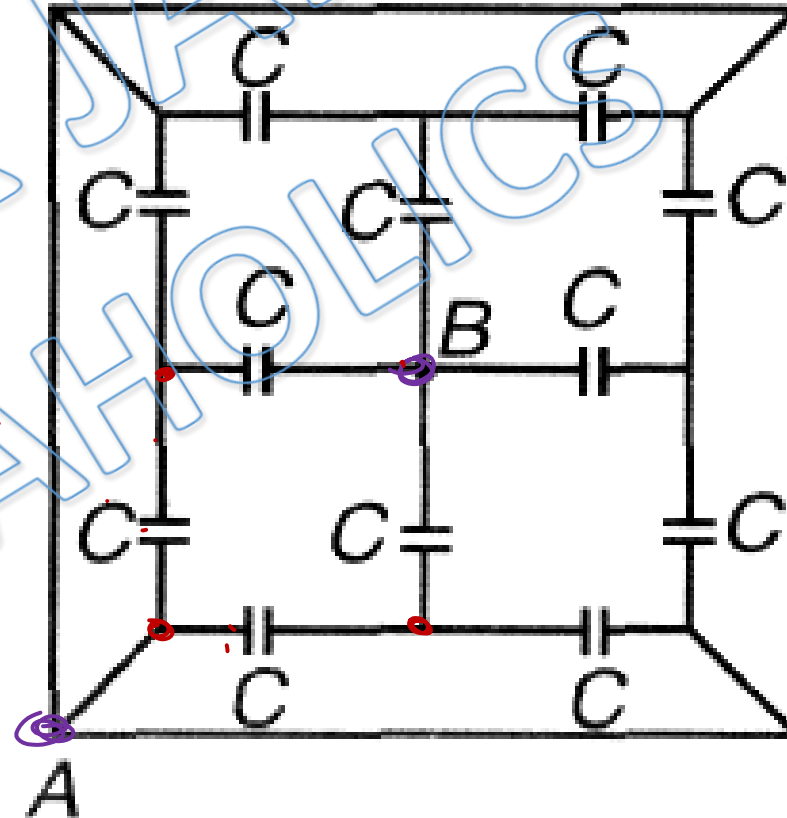
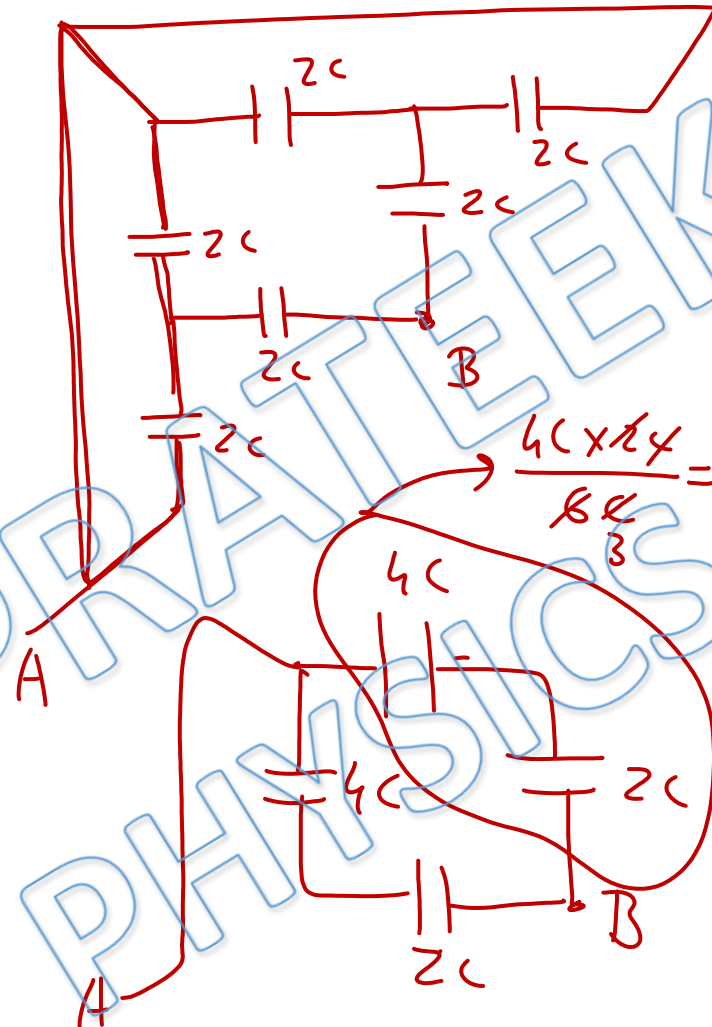
(Q.10) Four metallic plates each with a surface area of one side A are placed at a distance d from each other. The plates are connected as shown in the circuit diagram. Then the capacitance of the system between a and b is

- (a) $\frac{3\epsilon_0 A}{d}$
- (b) $\frac{2\epsilon_0 A}{d}$
- (c) $\frac{2\epsilon_0 A}{3d}$
- ~~(d) $\frac{3\epsilon_0 A}{2d}$~~

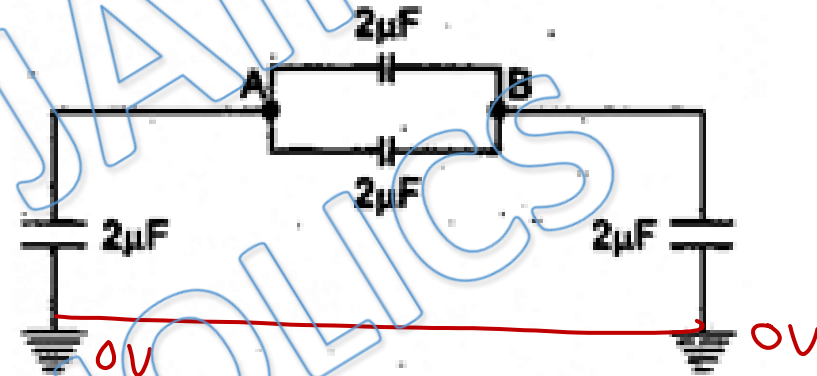


(Q.11) Equivalent capacitance between A and B is

- (a) $4C/3$
- (b) $8C/3$
- (c) $12C$
- (d) $5C/12$

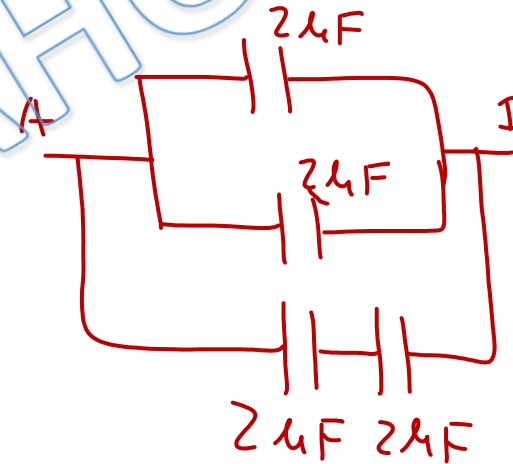


(Q.12) Find equivalent capacitance between A and B



- ~~(a) $5\mu\text{F}$~~
- (c) $3\mu\text{F}$

- (b) $4\mu\text{F}$
- (d) $2\mu\text{F}$



For Video Solution of this DPP, Click on below link

Video Solution
on Website:-

<https://physicsaholics.com/home/courseDetails/103>

Video Solution
on YouTube:-

https://youtu.be/0C-wN30Uf_8

Written Solution
on Website:-

<https://physicsaholics.com/note/notesDetails/63>

 **SUBSCRIBE**



[@Physicsaholics](#)

[@Physicsaholics_prateek](#)

[@NEET_Physics](#)

[@IITJEE-Physics](#)

[physicsaholics.com](#)

[Unacademy](#)



CLICK

Chalo Niklo