

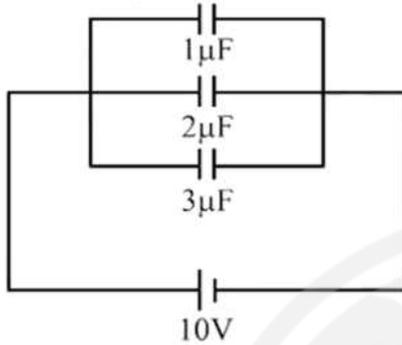
Prayas JEE (2025)

Physics

Capacitor

DPP: 2

Q1 Three initially uncharged capacitors are connected to a battery of 10 V in parallel combination. Find out the following?

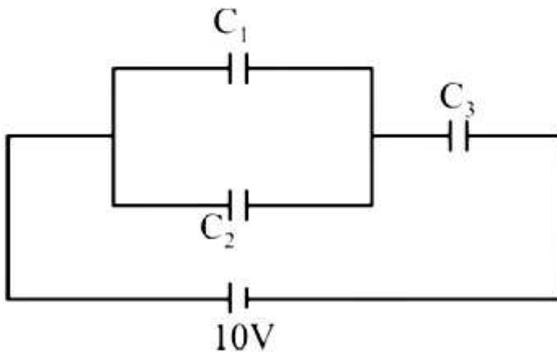


- (i) Charge flow from the battery.
- (ii) Total energy stored in the capacitors.
- (iii) Heat produced in the circuit.
- (iv) Potential energy in the $3\mu\text{F}$ capacitor.

Q2 Two capacitors of capacitances $C_1 = 6\mu\text{F}$ and $C_2 = 3\mu\text{F}$ are connected in series across a cell of emf 18 V. Calculate

- (i) The equivalent capacitance,
- (ii) The potential difference across each capacitor,
- (iii) The charge on each capacitor.

Q3 In the circuit shown the capacitors are $C_1 = 15\mu\text{F}$; $C_2 = 10\mu\text{F}$ and $C_3 = 25\mu\text{F}$. Find



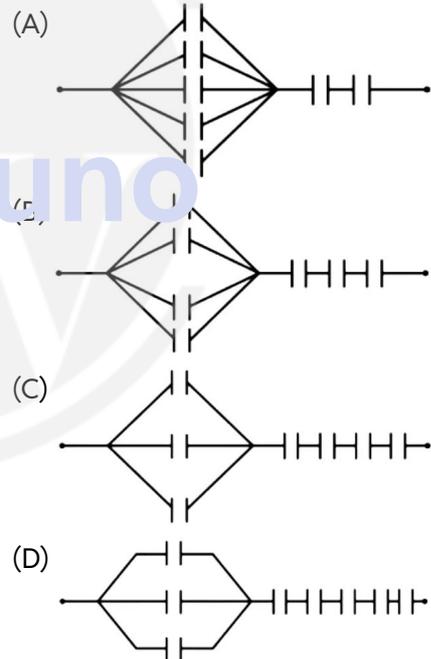
- (i) The equivalent capacitance of the circuit,
- (ii) The charge on each capacitor and

(iii) The potential difference across each capacitor

Q4 A parallel plate capacitor is made by stacking n equally spaced plates, connected alternately. If the capacitance between any two plates is C then the resultant capacitor is.

- (A) C
- (B) nC
- (C) $(n - 1)C$
- (D) $(n + 1)C$

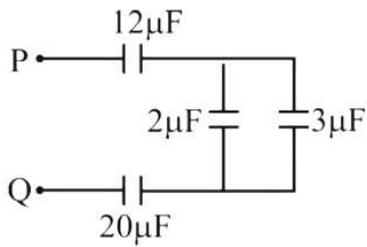
Q5 Seven capacitors each of capacity $2\mu\text{F}$ are to be so connected to have a total capacity $\frac{10}{11}\mu\text{F}$. Which will be the necessary figure as shown ?



Q6 In the circuit diagram shown in the adjoining figure, the resultant capacitance between P and Q is

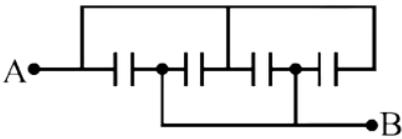


Android App | iOS App | PW Website



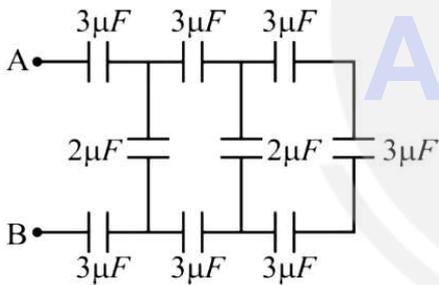
- (A) $47 \mu\text{F}$ (B) $3 \mu\text{F}$
 (C) $60 \mu\text{F}$ (D) $10 \mu\text{F}$

Q7 Four condensers are joined as shown in the adjoining figure. The capacity of each is $8 \mu\text{F}$. The equivalent capacity between the points A and B will be.



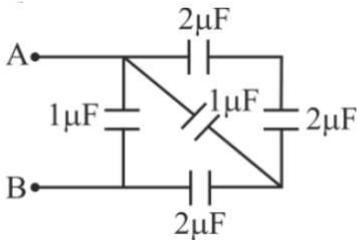
- (A) $32 \mu\text{F}$ (B) $2 \mu\text{F}$
 (C) $8 \mu\text{F}$ (D) $16 \mu\text{F}$

Q8 The resultant capacitance between A and B in the following figure is equal to



- (A) $1 \mu\text{F}$ (B) $3 \mu\text{F}$
 (C) $2 \mu\text{F}$ (D) $1.5 \mu\text{F}$

Q9 The total capacity of the system of capacitors shown in the adjoining figure between the points A and B is

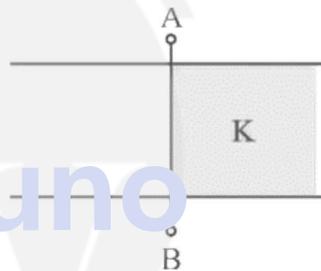


- (A) $1 \mu\text{F}$ (B) $2 \mu\text{F}$
 (C) $3 \mu\text{F}$ (D) $4 \mu\text{F}$

Q10 Separation between the plates of a parallel plates capacitor is d and the area of each plate is A . When a slab of material of dielectric constant k and thickness t ($t < d$) is introduced between the plates, its capacitance becomes.

- (A) $\frac{\epsilon_0 A}{d+t\left(1-\frac{1}{k}\right)}$
 (B) $\frac{\epsilon_0 A}{d+t\left(1+\frac{1}{k}\right)}$
 (C) $\frac{\epsilon_0 A}{d-t\left(1-\frac{1}{k}\right)}$
 (D) $\frac{\epsilon_0 A}{d-t\left(1+\frac{1}{k}\right)}$

Q11 A dielectric of constant K is slipped between the plates of parallel plate condenser in half of the space as shown in the figure. If the capacity of air condenser is C , then new capacitance between A and B will be.



- (A) $\frac{C}{2}$
 (B) $\frac{C}{2K}$
 (C) $\frac{C}{2}(1+K)$
 (D) $\frac{2(1+K)}{C}$

Q12 A parallel plates capacitor has a capacity C . The separation between the plates is doubled and a dielectric medium is introduced between the plates. If the capacity now becomes $2C$, the dielectric constant of the medium is.

- (A) 2 (B) 1
 (C) 4 (D) 8



Answer Key

Q1 (i) $60 \mu C$ (ii) $300 \mu J$ (iii) $300 \mu J$ (iv)
 $150 \mu J$

Q2 (i) $C = 2 \mu F$
(ii) $V_1 = 6 V, V_2 = 12 V$
(iii) $Q_1 = Q_2 = CV = 36 \mu C$

Q3 (i) $12.5 \mu F$

(ii) $Q_1=75\mu C, Q_2= 50\mu C, Q_3= 125\mu C$

(iii) $V_1=V_2=V_3= 5V$

Q4 (C)

Q5 (A)

Q6 (B)

Q7 (A)

Q8 (A)

Q9 (B)

Q10 (C)

Q11 (C)

Q12 (C)



[Android App](#)

| [iOS App](#)

| [PW Website](#)

ATDB.uno