# Prayas JEE (2025)

## Physics

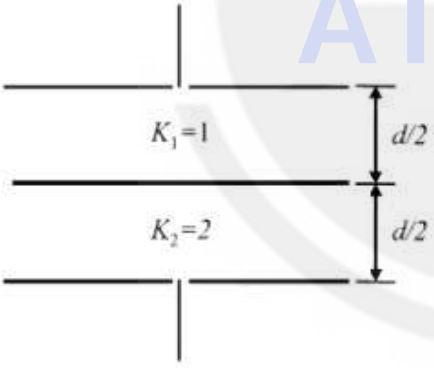
## Capacitor

**DPP: 4**

**Q1** A parallel plate capacitor having air as dielectric medium is charged by a potential difference of $\mathrm{V}$ volt. After disconnecting the battery, the distance between the plates of the capacitor is increased using an insulated handle. As a result, potential difference between the plates

(A) Increases
(B) Does not change
(C) Becomes zero
(D) Decreases

**Q2** Two parallel plates of area $A$ are separated by two different dielectric as shown in figure. The net capacitance is




(A) $\frac{\varepsilon_0 A}{2d}$
(B) $\frac{\varepsilon_0 A}{d}$
(C) $\frac{3\varepsilon_0 A}{d}$
(D) $\frac{4\varepsilon_0 A}{3d}$

**Q3** A metal foil of negligible thickness is introduced between two plates of a capacitor at the centre. The capacitance of capacitor will be

(A) Same
(B) Double
(C) Half
(D) $K$ times

**Q4** Two identical air core capacitors are connected in series to a voltage source of $15\ \mathrm{V}$. If one of the capacitors is filled with a medium of dielectric constant $4$, the new potential across this capacitor is

(A) $5\ \mathrm{V}$
(B) $8\ \mathrm{V}$
(C) $3\ \mathrm{V}$
(D) $12\ \mathrm{V}$

**Q5** Dielectrics is inserted in charged capacitor (battery removed), then quantity that remains constant is

(A) Capacitance
(B) Potential
(C) Intensity
(D) Charge

**Q6** An air parallel plate capacitor has capacity $C$. The capacity and distance between plates are doubled when immersed in a liquid. Then dielectric constant of the liquid is

(A) $1$
(B) $2$
(C) $3$
(D) $4$

**Q7** A parallel plate air capacitor has a capacitance $C$. When it is half filled with a dielectric constant 5 , the percentage increase in the capacitance will be

(A) $400\%$
(B) $66.6\%$
(C) $33.3\%$
(D) $200\%$

**Q8** Two capacitors of capacitance $2\mu\text{F}$ and $4\mu\text{F}$ respectively are connected in series. Thecombination is connected across a potential difference of $10\ \text{V}$. The ratio of energies stored by capacitors will be

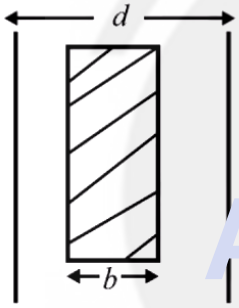
(A) $1:\sqrt{2}$

(B) $2:1$

(C) $1:4$

(D) $4:1$

**Q9** A slab of copper of thickness $b$ is inserted in between the plates of parallel plate capacitor as shown in figure. The separation between the plates is $d$ if $b = d/2$, then the ratio of capacities of capacitors after and before inserting the slab will be



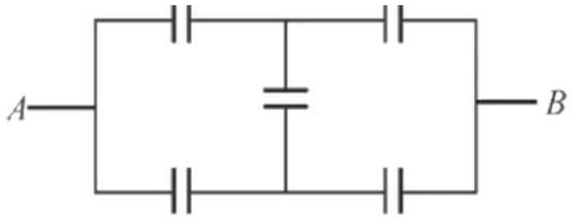

(A) $\sqrt{2}:1$

(B) $2:1$

(C) $1:1$

(D) $1:\sqrt{2}$

**Q10** Each capacitor shown in figure is $2\mu\text{F}$. Then the equivalent capacitance between points $A$ and $B$ is




(A) $2\mu\text{F}$

(B) $4\mu\text{F}$

(C) $6\mu\text{F}$

(D) $8\mu\text{F}$

# Answer Key

| | |
|---|---|
| Q1 | A |
| Q2 | D |
| Q3 | A |
| Q4 | C |
| Q5 | D |
| Q6 | D |
| Q7 | B |
| Q8 | B |
| Q9 | B |
| Q10 | A |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