



Because of Today Tomorrow Will Be better

# RK Academy

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AZIMABAD, BALASORE

WEEKLY TEST

CLASS: XII

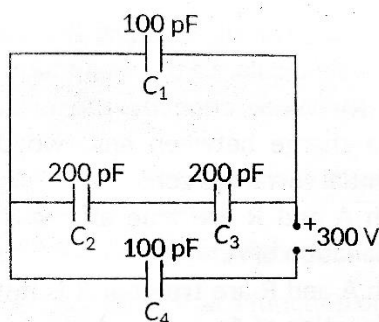
SUBJECT: PHYSICS

FM: 20

TIME: 40 MIN

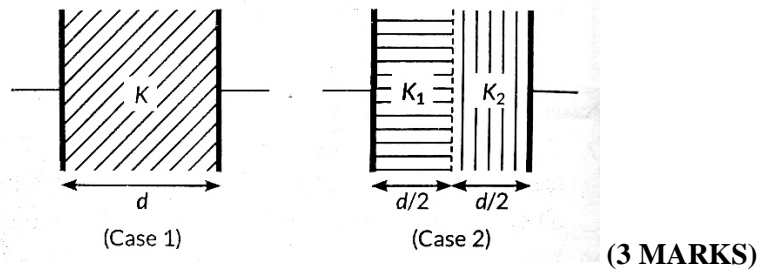
**(1 MARK)**

1. Capacitance Of parallel Plate capacitor is  $4\mu\text{F}$ , if after inserting dielectric the capacitance become  $12\mu\text{F}$  then what will be the dielectric constant?  
a. 4                      b. 3                      c. 12                      d. 48
2. Two capacitors of capacitance  $2 C_0$  and  $6 C_0$  are first connected in series and then in parallel across the same battery. The ratio of energies stored in series combination to that in parallel is  
a.  $\frac{1}{4}$                       b.  $\frac{1}{6}$                       c.  $\frac{2}{15}$                       d.  $\frac{3}{16}$
3. A charge particle is placed between the plates of a charged parallel plate capacitor. It experiences a force  $F$ . If one of the plates is removed, the force on the charge particle becomes  
a.  $F$                       b.  $2F$                       c.  $F/2$                       d. Zero
4. A capacitor plates are charged by a battery with ' $V$ ' volts. After charging battery is disconnected and a dielectric slab with dielectric constant ' $K$ ' is inserted between its plates, the potential across the plates of the capacitor will become  
a. 0                      b.  $V/2$                       c.  $V/K$                       d.  $VK$
5. Capacitance of a spherical conductor of radius  $1800\text{Km}$  is  
a.  $2 \times 10^{-4} \mu\text{F}$                       b.  $200 \text{ F}$                       c.  $200 \mu\text{F}$                       d. infinity
6. What happened to capacitance of a parallel plate capacitor when a conductor is fully filled inside it. Explain with expression. **(2 MARKS)**
7. Obtain the equivalent capacitance of the network shown in figure. For a  $300 \text{ V}$  supply, determine the charge drawn from battery. **(2MARKS)**



8. The space between the plates of a parallel plate capacitor is completely filled in two ways. In the first case, it is filled with a slab of dielectric constant  $K$ . In the second case, it is filled with two slabs of equal thickness and dielectric constants  $K_1$  and  $K_2$  respectively as shown in the figure. The

capacitance of the capacitor is same in the two cases. Obtain the relationship between  $K$ ,  $K_1$  and  $K_2$ .



9. deduce the capacitance of a parallel plate capacitor with a dielectric of constant  $k$  and thickness  $d$  is placed inside it. **(3 MARKS)**

**10. (5 MARKS)**

- Derive an expression for the capacitance of a parallel plate capacitor with air present between the two plates.
- In a parallel plate capacitor with air between the plates, each plate has an area of  $6 \times 10^{-3} \text{ m}^2$  and the separation between the plates is 3 mm. Calculate the capacitance of the capacitor. ( $\epsilon_0 = 8.85 \times 10^{-12} \text{ C}^2/\text{Nm}^2$ )