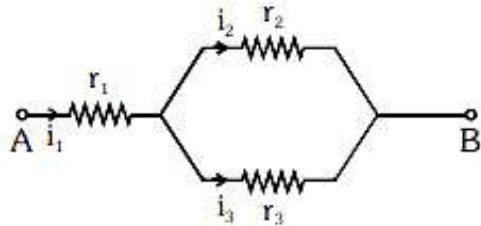


PHYSICS

**CAPACITORS AND CURRENT
ELECTRICITY**

71. Three resistors having resistances r_1 , r_2 and r_3 are connected as shown in the given circuit. The ratio $\frac{i_3}{i_1}$ of currents in terms of resistances used in the circuit is

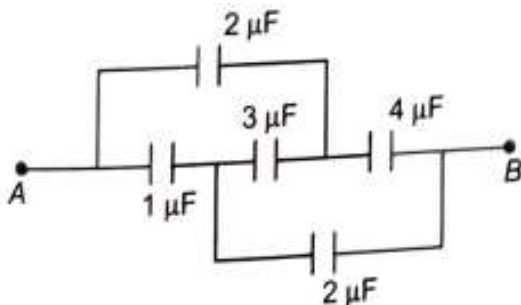


- (1) $\frac{r_2}{r_1 + r_3}$
- (2) $\frac{r_1}{r_2 + r_3}$
- (3) $\frac{r_2}{r_2 + r_3}$
- (4) $\frac{r_1}{r_1 + r_2}$

72. The mobility of charge carries changes with

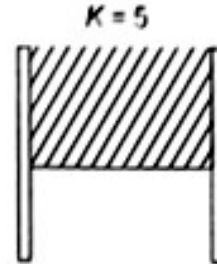
- (1) Change in the electric field
- (2) Change in the length of the conductor
- (3) Change in the cross-sectional area of conductor
- (4) Change in the average collision time

73. Equivalent capacitance between A and B is



- (1) $2 \mu\text{F}$
- (2) $0.5 \mu\text{F}$
- (3) $1 \mu\text{F}$
- (4) $4 \mu\text{F}$

74. A parallel plate air capacitor has capacitance C . Now half of the space is filled with a dielectric material with dielectric constant $K = 5$ as shown in figure. The new capacitance is

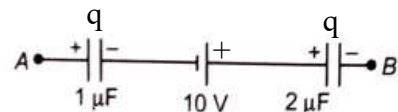


- (1) $\frac{C}{3}$
- (2) $3C$
- (3) $\frac{5C}{2}$
- (4) $\frac{3C}{2}$

75. Q_1 charge is given to one plate of a parallel plate capacitor of capacitance C and Q_2 charge is given to other plate. The potential difference developed between two plates is

- (1) $\frac{Q_1 + Q_2}{2C}$
- (2) $\frac{Q_1 - Q_2}{2C}$
- (3) $\frac{Q_1 + Q_2}{C}$
- (4) $\frac{Q_1 - Q_2}{C}$

76. A circuit has section AB as shown in figure. If the charge on each capacitor is $10 \mu\text{C}$, then potential difference $V_A - V_B$ is

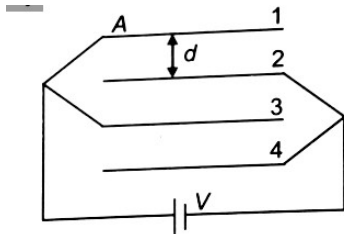


- (1) 5 V
- (2) -5 V
- (3) 10 V
- (4) -10 V

77. On increasing the temperature, the resistivity of

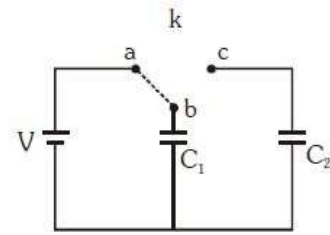
- (1) Conductors decrease
- (2) Insulators decrease
- (3) Semi-conductors decrease
- (4) (2) and (3) are correct

78. Area of one side of each plate is A and separation between consecutive plates is d . Emf of the battery connected is V . The charge on plate 2 is



- (1) $\frac{A\epsilon_0 V}{d}$ (2) $\frac{-2A\epsilon_0 V}{d}$
 (3) $\frac{-A\epsilon_0 V}{d}$ (4) $\frac{2A\epsilon_0 V}{d}$

79. Two identical capacitors C_1 and C_2 of equal capacitance are connected as shown in the circuit. Terminals a and b of the key k are connected to charge capacitor C using battery of emf V volt. Now disconnecting a and b the terminals b and c are connected. Due to this, what will be the percentage loss of energy?



- (1) 25% (2) 75%
 (3) 0% (4) 50%
80. There are two identical capacitors, the first one is A uncharged and filled with a dielectric of constant K while the other one is charged to potential having air between its plates. If two capacitors are joined end to end, the common potential will be

- (1) $\frac{V}{K-1}$ (2) $\frac{KV}{K+1}$
 (3) $\frac{KV}{K-1}$ (4) $\frac{V}{K+1}$