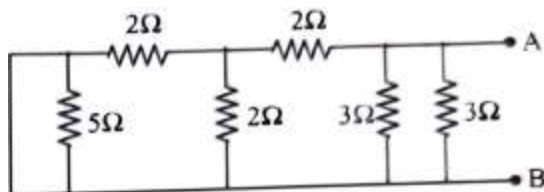


PHYSICS

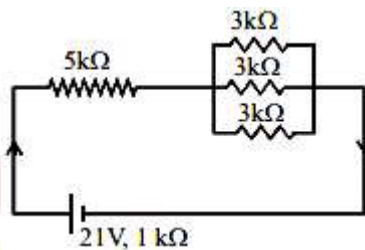
**CAPACITORS AND CURRENT
ELECTRICITY**

61. The equivalent resistance of the given circuit between the terminals A and B is



- (1) $0\ \Omega$ (2) $3\ \Omega$
 (3) $\frac{9}{2}\ \Omega$ (4) $1\ \Omega$

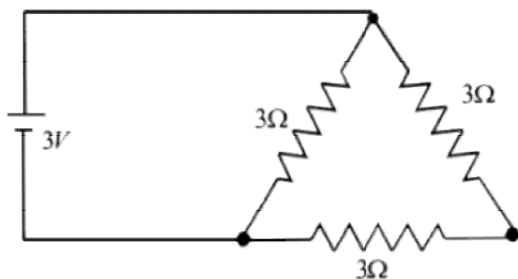
62. In the figure given, the electric current flowing through the $5\ \text{k}\Omega$ resistor is $x\ \text{mA}$



The value of x to the nearest integer is ____

- (1) $1\ \text{mA}$ (2) $2\ \text{mA}$
 (3) $3\ \text{mA}$ (4) $4\ \text{mA}$

63. A $3\ \text{V}$ battery with negligible internal resistance is connected in a circuit as shown in the figure. The current I , in the circuit will be

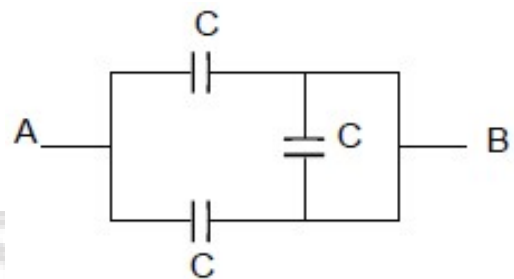


- (1) $1\ \text{A}$ (2) $1.5\ \text{A}$
 (3) $2\ \text{A}$ (4) $\frac{1}{3}\ \text{A}$

64. A parallel plate capacitor has a uniform electric field \vec{E} in the space between the plates. If the distance between the plates is d and the area of each plate is A , the energy stored in the capacitor is (ϵ_0 = permittivity of free space)

- (1) $\frac{E^2 Ad}{\epsilon_0}$ (2) $\frac{1}{2} \epsilon_0 E^2$
 (3) $\epsilon_0 EAd$ (4) $\frac{1}{2} \epsilon_0 E^2 Ad$

65. The equivalent capacitance of the combination shown in the figure is



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

66. The electrostatic force between the metal plates of an isolated parallel plate capacitor C having a charge Q and area A , is

- (1) independent of the distance between the plates
 (2) linearly proportional to the distance between the plates
 (3) inversely proportional to the distance between the plates
 (4) proportional to the square root of the distance between the plates

67. A parallel plate condenser with oil between the plates (dielectric constant of oil $K = 2$) has a capacitance C . If the oil is removed, then capacitance of the capacitor becomes
- (1) $\sqrt{2}C$ (2) $2C$
(3) $\frac{C}{\sqrt{2}}$ (4) $\frac{C}{2}$
68. A $4 \mu\text{F}$ capacitor is charged to 400 V and then its plates are joined through a resistance of $1 \text{ k}\Omega$. The heat produced in the resistance is
- (1) 0.16 J (2) 1.28 J
(3) 0.64 J (4) 0.32 J
69. The masses of the three wires of copper are in the ratio of $1 : 3 : 5$ and their lengths are in the ratio of $5 : 3 : 1$. The ratio of their electrical resistance is
- (1) $1 : 3 : 5$ (2) $5 : 3 : 1$
(3) $1 : 25 : 125$ (4) $125 : 15 : 1$
70. The effective resistance of a parallel connection that consists of four wires of equal length, equal area of cross-section and same material is 0.25Ω . What will be the effective resistance if they are connected in series?
- (1) 4Ω (2) 0.25Ω
(3) 0.5Ω (4) 1Ω

