

PHYSICS

101. A dipole of dipole moment 'p' is placed in non-uniform electric field along x-axis. Electric field is increasing at the rate of 1 V m^{-1} , then the force on dipole is

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

102. A parallel plate capacitor having a plate separation of 2 mm is charged by connecting it to a 300 V supply. The energy density is

- (1) 0.01 J m^{-3}
- (2) 0.1 J m^{-3}
- (3) 1.0 J m^{-3}
- (4) 10 J m^{-3}

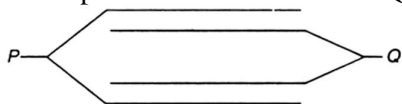
103. The work done in increasing the voltage across the plates of a capacitor from 5 V to 10 V is W. The work done in increasing the voltage from 10 V to 15 V will be

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

104. A spherical drop of capacitance $1 \mu\text{F}$ is broken into eight drops of equal radius. Capacitance of each small drop is

- (1) $\frac{1}{8} \mu\text{F}$
- (2) $\frac{1}{4} \mu\text{F}$
- (3) $\frac{1}{2} \mu\text{F}$
- (4) $\frac{1}{16} \mu\text{F}$

105. Figure shows four plates each of area A and separated from by a distance d. What is the capacitance between P and Q?



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

106. A current of 5 A is passing through a metallic wire of cross-sectional area $4 \times 10^{-6} \text{ m}^2$. If the density of charge carriers of the wire is $5 \times 10^{26} \text{ m}^{-3}$, the drift velocity of the electrons will be

- (1) $1 \times 10^2 \text{ m s}^{-1}$
- (2) $1.56 \times 10^{-2} \text{ m s}^{-1}$
- (3) $1.56 \times 10^{-3} \text{ m s}^{-1}$
- (4) $1 \times 10^{-2} \text{ m s}^{-1}$

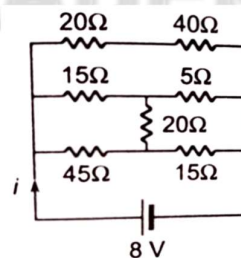
107. On increasing the temperature of a conductor, its resistance increases because

- (1) electron density increases
- (2) mass of electrons increases
- (3) relaxation time decreases
- (4) none of the above

108. If on stretching a wire its radius decreases by 1%, the resistance will

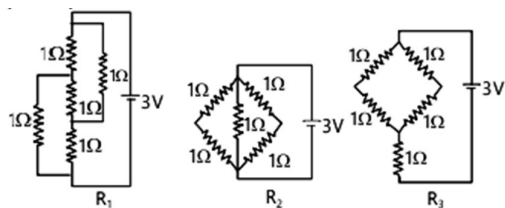
- (1) increase by 1%
- (2) increase by 2%
- (3) increase by 4%
- (4) not change

109. In the given circuit, the value of i is



- (1) 0.10 A
- (2) 0.20 A
- (3) 0.40 A
- (4) $\frac{2}{3}$ A

110. Figure shows three resistor configurations R_1 , R_2 and R_3 connected to 3 V battery. If the power dissipated by the configurations R_1 , R_2 and R_3 is P_1 , P_2 and P_3 respectively, then



(1) $P_1 > P_2 > P_3$

(2) $P_1 > P_3 > P_2$

(3) $P_2 > P_1 > P_3$

(4) $P_3 > P_2 > P_1$



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