Physicsaholics

DPP – 1 (Current Electricity)

Video Solution on Website:- https://physicsaholics.com/home/courseDetails/55

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Q 1. The current flowing through wire depends on time as, $I = 3t^2 + 2t + 5$. The charge flowing through the cross - section of the wire in time $t = 0\ s$ to $t = 2\ s$ is:

(a) 22 C
(b) 20 C
(c) 18 C
(d) 5 C

Q 2. The charge flowing through a conductor varies with time as $q = 8t - 3t^2 + 5t^3$. Find time after which the current reaches to minimum value of current:
(a) 0.2 sec
(b) 2 sec
(c) 1.2 sec
(d) 2.5 sec

Q 3. The charge flowing through a conductor beginning with time t=0 is given by the formula $q = 2t^2 + 3t + 1$(coulomb). Find the current at the end of the 5^{th} seconds:
(a) 2.3 Amp
(b) 25 Amp
(c) 2.5 Amp
(d) 23 Amp

Q 4. In a conductor, 4 coulombs of charge flows for 2 seconds . The value of electric current will be:
(a) 4 Amp
(b) 2 Amp
(c) 1 Amp
(d) 3 Amp

Q 5. A current of 4.8 A is flowing in a conductor. The number of electrons passing per second through the conductor will be:
(a) 3×10^{20}
(b) 76.8×10^{20}
(c) 7.68×10^{20}
(d) 3×10^{19}

Q 6. When current i is flowing through a conductor, the drift velocity is v. If the value of current through the conductor and its area of cross-section is doubled, then new drift velocity will be:

(a) $4v$
(b) $\frac{v}{2}$
(c) $\frac{v}{4}$
(d) v

Q 7. Every atom makes one free electron in copper. If 1.1 ampere current is flowing in the wire of copper having 1 mm diameter, then the drift velocity (approx.) will be (Density of copper = $9 \times 10^3\ kg/m^3$ and atomic weight = 63):
(a) $0.3\ mm/sec$
(b) $0.1\ mm/sec$

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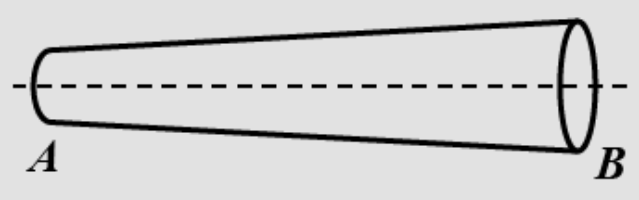
(c) 0.2 mm/sec (d) 0.2 cm/sec

Q 8. An electric current of 16A exists in a metal wire of cross section $10^{-6}\ m^2$ and length 1m. Assuming one free electron per atom. The drift speed of the free electrons in the wire will be: (Density of metal = $5 \times 10^4\ kg/m^3$ and atomic weight = 60):
(a) 0.5 mm/sec (b) 0.2 mm/sec
(c) 0.4 mm/sec (d) 7.5 mm/sec

Q 9. An electric cell of emf E is connected across a copper wire of diameter d and length l. The drift velocity of electrons in the wire is V_d. If the length of the wire is changed to $2l$, the new drift velocity of electrons in the copper wire will be:
(a) V_d (b) $2V_d$ (c) $\frac{V_d}{2}$ (d) $\frac{V_d}{4}$

Q 10. Drift velocity V_d. varies with the intensity of electric field as per the relation:
(a) $V_d \propto E$ (b) $V_d \propto \frac{1}{E}$
(c) $V_d = constant$ (d) $V_d \propto E^2$

Q 11. A wire has a nonuniform cross sectional area as shown in the figure. A steady current i flows through it. Which one of the following statements is correct?



(a) Drift speed of the electron is constant
(b) Drift speed decreases on moving from A to B
(c) Drift speed increases on moving from A to B
(d) Drift speed varies randomly

Q 12. A conductor carries a current of 50 μ A. If the area of cross-section of the conductor is 50 mm^2, then value of the current density in A/m^2 is:
(a) 0.5 (b) 1
(c) 10^{-3} (d) 10^{-6}

Q 13. A steady current flow in a metallic conductor of non-uniform cross-section. The quantity/ quantities constant along the length of the conductor is/are:
(a) Current, electric field and drift speed
(b) Drift speed only
(c) Current and drift speed
(d) Current only

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Answer Key

Q.1 a	**Q.2 a**	**Q.3 d**	**Q.4 b**	**Q.5 d**
Q.6 d	**Q.7 b**	**Q.8 b**	**Q.9 c**	**Q.10 a**
Q.11 b	**Q.12 b**	**Q.13 d**		

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