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NEET CURRENT ELECTRICITY — DRIFT OF ELECTRONS AND ORIGIN OF RESISTIVITY, MOBILITY — PYQS

Max. Marks: 28 **Questions:** 7

Section A (MCQ) — 7 questions

Q.1 A uniform wire of diameter d carries a current of 100 mA when the mean drift velocity of electrons in the wire is v. For a wire of diameter $\frac{d}{2}$ of the same material to carry a current of 200 mA, the mean drift velocity of electrons in the wire is [RE-NEET (UG) 2024]

(1) 4v (2) 8v (3) v (4) 2v

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Q.2 A copper wire of length 10 m and radius $\left(\frac{10^{-2}}{\sqrt{\pi}}\right)$ m has electrical resistance of 10 Ω. The current density in the wire for an electric field strength of 10 (V/m) is [NEET (UG) 2022]

(1) 10^4 A/m^2 (2) 10^6 A/m^2
(3) 10^{-5} A/m^2 (4) 10^5 A/m^2

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Q.3 **Column - I** gives certain physical terms associated with flow of current through a metallic conductor. **Column-II** gives some mathematical relations involving electrical quantities. Match **column-I** and **column-II** with appropriate relations. [NEET (UG) 2021]

Column - I		Column - II	
A.	Drift Velocity	P.	$\frac{m}{ne^2\rho}$
B.	Electrical Resistivity	Q.	nev_d
C.	Relaxation Period	R.	$\frac{eE}{m}\tau$
D.	Current Density	S.	$\frac{E}{J}$

(1) (A)-(R); (B)-(Q); (C)-(S); (D)-(P)
(2) (A)-(R); (B)-(S); (C)-(P); (D)-(Q)
(3) (A)-(R); (B)-(S); (C)-(Q); (D)-(P)
(4) (A)-(R); (B)-(P); (C)-(S); (D)-(Q)

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Q.4 A charged particle having drift velocity 7.5×10^{-4} m s^{-1} in an electric field of 3×10^{-10} V m^{-1} has a mobility in m^2 V^{-1} s^{-1} of : [NEET (UG) 2020]

(1) 2.5×10^6 (2) 2.5×10^{-6}
(3) 2.25×10^{-15} (4) 2.25×10^{15}

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Q.5 The resistance of a wire is 'R' ohm. If it is melted and stretched to 'n' times its original length, its new resistance will be [NEET 2017]

(1) $\frac{R}{n}$ (2) n^2R (3) $\frac{R}{n^2}$ (4) nR

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Q.6 The mean free path of electrons in a metal is 4×10^{-8} m. The electric field which can give on an average 2 eV energy to an electron in the metal will be in units V/m [AIPMT 2009]

(1) 5×10^{-11} (2) 8×10^{-11}
(3) 5×10^7 (4) 8×10^7

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Q.7 A wire of a certain material is stretched slowly by ten percent. Its new resistance and specific resistance become respectively [AIPMT 2008]

(1) both remain the same
(2) 1.1 times, 1.1 times
(3) 1.2 times, 1.1 times
(4) 1.21 times, same

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ANSWER KEY

Ques.	1	2	3	4	5	6	7				
Ans.	2	4	2	1	2	3	4				