**COMSATS** **University Islamabad, Lahore Campus**

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**Assignment no. 2**

**Q1.** A beam contains 2.0 x 108 doubly charged positive ions per cubic centimeter, all of which are moving north with a speed of 1.0 x 105 m/s. What are the (a) magnitude and (b) direction of the current density ***J*** (c) What additional quantity do you need to calculate the total current *i* in this ion beam?

**Q2. A** small but measurable current of 1.2 x 10-10 A exists in a copper wire whose diameter is 2.5 mm. The number of charge carriers per unit volume is 8.49 x 1028 m-3. Assuming the current is uniform, calculate the (a) current density and (b) electron drift speed.

**Q3.** A wire 4.00 m long and 6.00 mm in diameter has a resistance of 15.0 mΩ. A potential difference of 23.0 V is applied between the ends. (a) What is the current in the wire? (b) What is the magnitude of the current density? (c) Calculate the resistivity of the wire material.

**Q4.** A potential difference of 3.00 nV is set up across a 2.00 cm length of copper wire that has a radius of 2.00 mm. How much charge drifts through a cross section in 3.00 ms?