	Ministry of Higher Education	
	Manzala Higher Institute for Engineering and Technology	
Second semester :2023/2024.		**Course title:** **Electronic measurements**
Department: Electronic Eng.		**Code: COM 123.**
Sheet (2)		

Problem (1)

A PMMC voltmeter with a resistance of 20 Ω gives a full- scale deflection of 120° when a potential difference of 100 mV is applied across it. The moving coil has dimensions of 30 mm × 25 mm and is wound with 100 turns. The control spring constant is 0.375 × 10-6 N-m/degree. Find the flux density in the air gap. Find also the dimension of copper wire of coil winding if 30% of the instrument resistance is due to coil winding. The specific resistance of copper is 1.7 × 10-8 Ωm.

Problem (2)

The coil of a moving-coil voltmeter is 40 mm long and 30 mm wide and has 100 turns on it. The control spring exerts a torque of 240 × 10-6 N-m when the deflection is 100 divisions on full scale. If the flux density of the magnetic field in the air gap is 1 wb/m2, estimate the resistance that must be put in series with the coil to give one volt per division. The resistance of the voltmeter coil may be neglected.