Faculty of Engineering–Shoubra
Electrical Engineering Department
2nd year communication
Sheet (2)

Review Questions

1. List the three forces involved in the moving system of a deflection instrument. Explain, using neat sketches, the function of each force.

2. Sketch the basic construction of a typical PMMC instrument. Identify each part of the instrument. What is the source of its deflection, control, and damping torque?

3. List the advantages and disadvantages of PMMC instrument.

4. Develop the torque equation for a PMMC instrument and show why its scale is linear.

5. State Galvanometer function and how to protect this device?

Problems

1. A PMMC instrument with a 300-turn coil has 0.15T magnetic flux density in its air gaps. The coil dimensions are D=1.25 cm and L=2 cm. Calculate the torque when the coil current is 500 µA.

2. A PMMC instrument has 0.12T magnetic flux density in its air gaps. The coil dimensions are D=1.5 cm and L=2.25 cm. Determine the number of coil turns required to give a torque of 4.5 µ N.m while the coil has a current of 100 µA.

3. A galvanometer has 300 μV/mm voltage sensitivity and a megohm sensitivity of 1.5 MΩ. Determine its critical damping resistance.

4. A galvanometer has a current sensitivity of 500 nA /mm and a 3 kΩ critical damping resistance. Calculate its voltage sensitivity and megohm sensitivity.

5. Determine the current sensitivity and a megohm sensitivity for a galvanometer that deflects by 5 cm when the coil current is 20 μA.