

**Problem 1:**

(C)

**Problem 2:**

(D) Magnetic field lines have no sources or sinks.

**Problem 3:**

(E) Null measurements can be the most accurate measurements

**Problem 4:**(D)  $dE/dt = IV = 1080W$ .  $dE/dt = Fv$ .  $F = 108 N$ .  $\mu = F/N = 1.08$ .**Problem 5:**(D)  $V = (kQ/l) \int_0^1 dx/(2l-x) = (kQ/l)\ln 2$ **Problem 6:**

(E) The cube is an equipotential surface like the surface of a conductor.

**Problem 7:**(D) Define potential:  $\phi = kq/r$ 

All points on the wire are the same distance from point 1 and point 2.

$$\phi_1 = kq/(2b^2)^{1/2}$$

$$\phi_2 = kq/(5b^2)^{1/2}$$

$$\phi_2/\phi_1 = (2/5)^{1/2}$$

**Problem 8:**(B) dipole field: The magnitude of the dipole moment  $m = IA$ .**Problem 9:**

(E) Definition of the potential: work per unit charge