***New York City College of Technology***

***Fall 2013***

***Homework 1***

***Chapter 6***

**1 The voltage between two parallel plates separated by a distance of 5mm is 200V. Determine the electric field intensity.**

**2 The voltage between two parallel plates separated by a distance for 0.4in is 60V. Determine the electric field intensity.**

1in = 0. 254 m

0.4in = 0.01016

**3 The electric field intensity in the region between two parallel plates separated by a distance of 4cm is 2KV/m. Determine the voltage between the plates.**

**4 The electric field intensity in the region between two parallel plates separated by a distance of 8mm is 200V/mm. Determine the voltage between the plates.**

**5 A direct current of 5A is flowing a conductor. Determine the magnetic field intensity at a distance of 3m from the conductor.**

**6 A direct current of 4mA is flowing in a conductor. Determine the magnetic field intensity at a distance of 5ft from the conductor.**

1ft = 0.3048m

5ft = 1.524m

**7 For the parallel plates of Problem 6-3 determine the electric flux density if the dielectric is polyethylene ().**

**8 For the parallel plates of Problem 6-4, determine the electric flux density if the dielectric is air.**

**9 For the current carrying conductor of Problem 6-5, determine the magnetic flux density at a distance of 3m from the conductor if the medium is air**.

**10 For the current carrying conductor of Problem 6-6, determine the magnetic flux density at a distance of 5ft from the conductor if the medium is air.**

**11 The electric flux density normal to a rectangular surface with dimensions 8m x 75cm is 4μC/m2. Determine the value of the electric flux across the area.**

**12 The electric flux density normal to a circular surface with a diameter of 3m is 8μC/m2. Determine the value of the electric flux across the area**.

**13 the magnetic flux density normal to a circular surface with a radius of 5m is 4nWb/m2. Determine the value of the magnetic flux across the area.**

**14 The magnetic flux density normal to a rectangular surface with dimensions 30cm x 60cm is 12nWb/m2. Determine the value of the magnetic flux across the area.**

**15 A current of 8A is uniformly distributed over a rectangular conductor with dimensions 5mm x 4mm. Determine the current density.**

**16 A current of 4A is uniformly distributed over a circular conductor with a diameter of 3cm. Determine the current density.**

**17 Assume that the conductivity for the conductor of Problem 6-15 is 5MS/s. Determine the electric field intensity.**

**18 Assume that the conductivity for the conductor of Problem 6-16 is 6 x107 S/m. Determine the electric field intensity.**

**19 The rms magnitude of the magnetic field of a plane wave in air is . Assuming the E is in the positive x-direction, determine the following for a circular surface of diameter 50m in the x-y plane over which the field are constant.**

1. Ex
2. Pz
3. **Total power transmitted through area**

**20 The rms magnitude of the electric field of a plane wave in a sea water () is Ex = 3V/m. Assuming that H is in the positive y-direction, determine the following for a square surface with sides of 15m each in the x-y plane over which the fields are constant:**

1. **Hy**
2. **Pz**

1. **Total power transmitted through area**