(139) SE-sem-IV- CBGS - EXTC - WTP 31/5/16

QP Code : 546002

(3 Hours) **[Total Marks : 80**

N. B. : (1) Question No.**1** is **compulsory**.
(2) Attempt any **three** out of remaining questions.
(3) Use suitable data whenever is required.

1. Solve any **four** :– **20**
   (a) Describe significance of Boundary Conditions for Electric Field.
   (b) Explain the operation of Electromagnetic Pump.
   (c) Define Reflection and Transmission Coefficient.
   (d) Compare parallel with perpendicular polarization.
   (e) Define and explain Vector Magnetic Potential.

2. (a) Describe Poynting Theorem and explain various terms associated with the same **5**
   (b) Compare various numerical techniques such as FDM, FEM and MOM **5**
   (c) Obtain the Laplace's Equation for as infinitely long through whose cross section is shown in figure 1. **10**
   let V1= 10 V, V2=100 V, V3=40 V, V4=0V. USING ITERATION METHOD.

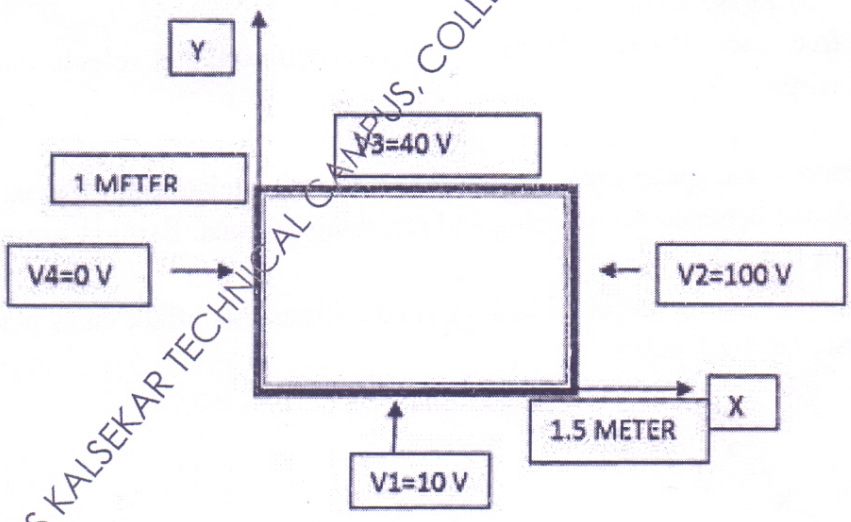

FIGURE 1:

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3. (a) A zero potential reference is at r=10 meter and point charge Q= 0.5 nC is placed at origin. Find potential at r=5 meter and 15 meter. **5**
   (b) Use MOM to find out the capacitance of parallel plate capacitor having plate area as 1* 1 meter and distance between two plates is 1 meter. Assume air dielectric capacitor. Voltage across capacitor is 2 volts. **10**
   (c) Derive the expression for magnetic field intensity due to infinite line conductor. **5**

4. (a) Circular loop conductor carrying current of 1 A is placed in x–y plane centred at origin. Find expression for Magnetic field intensity at any point P on Z- axis. **10**
   (b) Four like charges of 40 μC each are located at four corners of a square. The square diagonal is 12 meters. Find the force on 200 μC charge located 5 meter above the centre of a square.- **10**

5. (a) Define the following terms- **10**
      1) Wave Impedance
      2) Intrinsic Impedance
      3) Propagation Constant
      4) Attenuation Constant
      5) Phase Constant
   (b) In free space, $V= 6xy^2z+8$.At point P (1,2,-5) find E and volume charge density. **10**

6. (a) Describe the space wave propagation and derive relation for maximum distance between transmitting and receiving antenna. Earth is assumed to be flat. **10**
   (b) Explain ducting effect. Under what conditions this effect takes place. **5**
   (c) Describe the Fading. **5**
