

- 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

- Describe significance of Boundary Conditions for Electric Field.
- Explain the operation of Electromagnetic Pump.
- Define Reflection and Transmission Coefficient.
- Compare parallel with perpendicular polarization.
- Define and explain Vector Magnetic Potential.

2. (a) Describe Poynting Theorem and explain various terms associated with the same

5

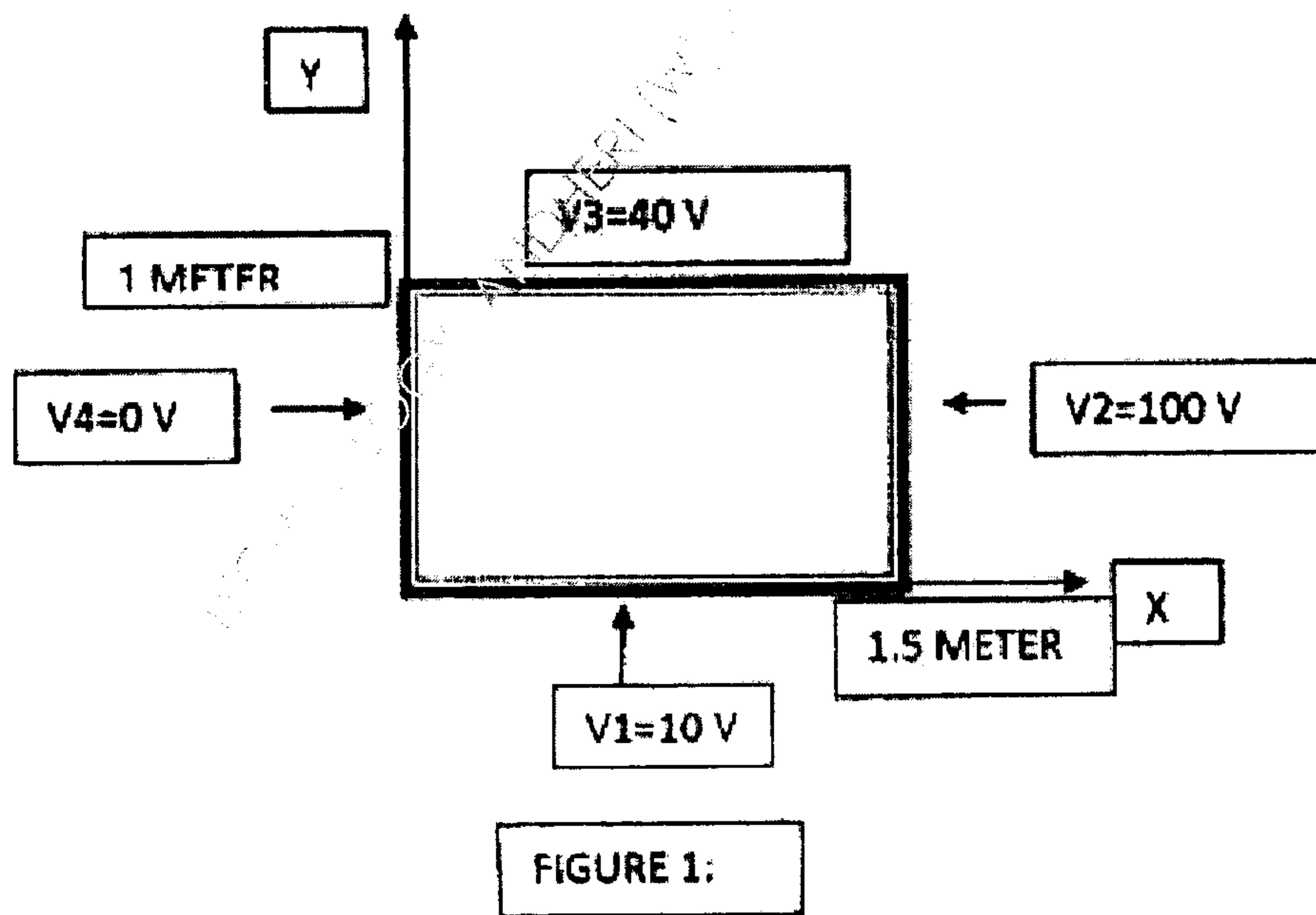
(b) Compare various numerical techniques such as FDM, FEM and MOM

5

(c) Obtain the Laplace's Equation for as infinitely long through whose cross section is shown in figure 1.

10

let  $V_1 = 10 \text{ V}$ ,  $V_2 = 100 \text{ V}$ ,  $V_3 = 40 \text{ V}$ ,  $V_4 = 0 \text{ V}$ . USING ITERATION METHOD.



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  $1 \times 1$  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  $40 \mu\text{C}$  each are located at four corners of a square. The square diagonal is 12 meters. Find the force on  $200 \mu\text{C}$  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
-