# NED UNIVERSITY OF ENGINEERING & TECHNOLOGY, KARACHI
## FIRST YEAR (COMPUTER SCIENCE AND INFORMATION TECHNOLOGY)
## ANNUAL EXAMINATION 2007
## BATCH 2006-07

**Time: 3 Hours** **Dated: 12-11-2007**
**Max. Marks: 80**

## ELECTRICAL TECHNOLOGY FUNDAMENTALS – (EE-115)

**Instructions:**
**1-Attempt any five questions,**
**2-All questions carry equal marks**

Q1(a) Using the Voltage dividing Rule, determine voltages $V_1, V_2$ and $V_3$ for the series circuit of Fig #1. Hence prove that the circuit follows KVL Principle ie $E = \Sigma V$ [08]

Q1(b) A portion of a residential service to a network is shown in Fig # 2 [08]
(i) Determine the current through each parallel branch of the network
(ii) Calculate the current drawn from 120 V source. Will the 20A Circuit Breaker trip ?
(iii) What is the total resistance of the network?
(iv) Determine the Power supplied by 120 V source. How does it compare to the total power of the load?

Q2(a) Define Thevenin's Theorem. Describe and apply the rules to find the Thevenin Equivalent circuit for Fig # 3. [08]

Q2(b) Write the mesh equations for the circuit of Fig # 4. & Solve for the branch current through resistor $R_3$. [08]

Q3(a) Apply Superposition Theorem to Fig # 5 to find current $I_2$ through 12 KΩ resistor [08]

Q3(b) Write the nodal equations for the circuit of fig # 6 & using determinants solve for the nodal voltages. [08]

Q4(a) Define frequency response? Discuss the frequency response for the basic circuit elements R, L and C. [08]

Q4(b) The voltage across a 1 μF capacitor is given below. Write down the sinusoidal expression for the current? Also sketch the curve between v & i. [08]
(i) $v = 20\sin 400t$
(ii) $v = 30\sin(400t - 70^0)$ .

Q5(a) Find the average value of the periodic waveforms shown in Fig # 7 [08]

Q5(b) Discuss the Importance of Electrical Technology to the Modern World. [08]

Q6(a) Using Voltage Dividing Rule, find the unknown voltages $v_R$ and $v_1$ for the circuit of Fig # 9 [07]

Q6(b) For the network of Fig # 10
(i) Find the Admittance of each parallel branch [09]
(ii) Determine the input Admittance
(iii) Calculate the input Impedance
(iv) Draw the Admittance Diagram

Q7(a) Find the value of i required to establish flux of $\varphi = 0.75 \times 10^{-4}$ wb in the series magnetic circuit of Fig # 11 [08]

Q7(b) Discuss

(i) Ferromagnetic Materials
(ii) Permeability and Permittivity
(iii) Air Gap
(iv) Fringing Effect

[08]

Q8(a) Discuss the advantages and disadvantages of Permanent Magnet Moving Coil (PMMC) instruments. [08]

Q8(b) What are Instrument Transformers ? Discuss. [08]

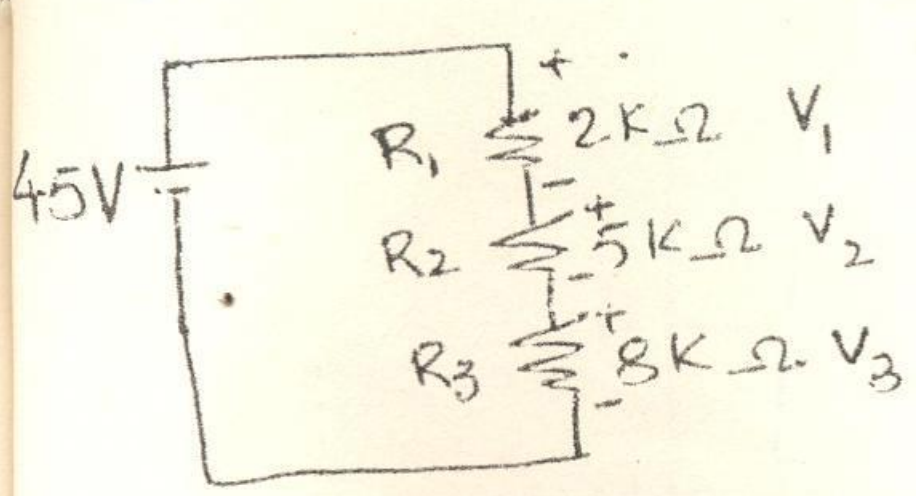


Fig #1

3-

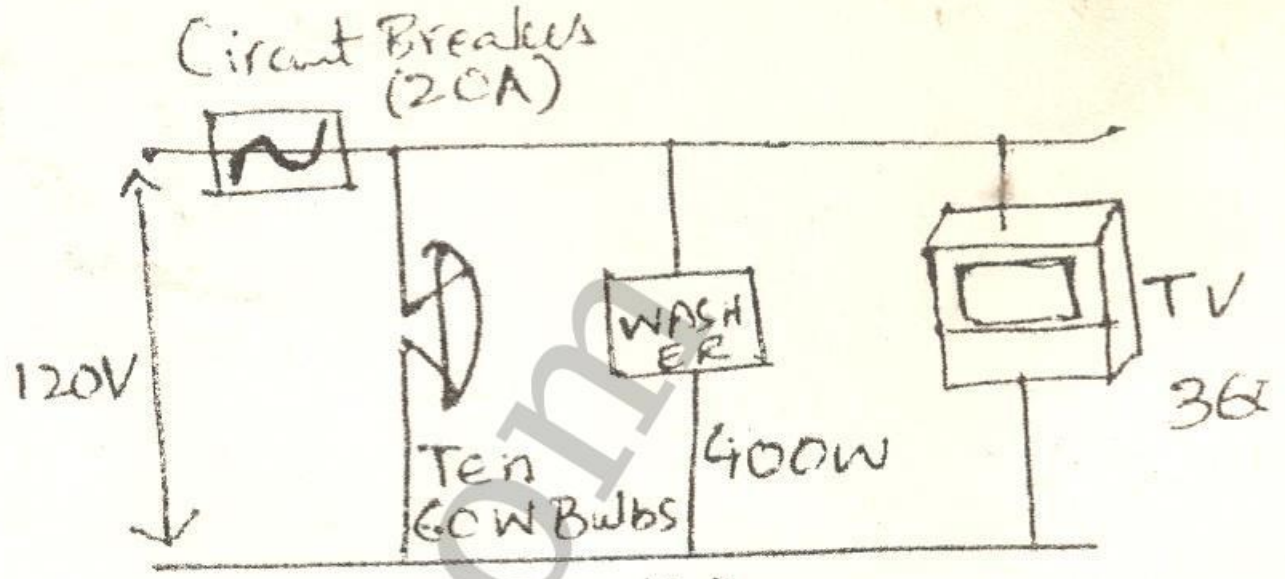


Fig #2

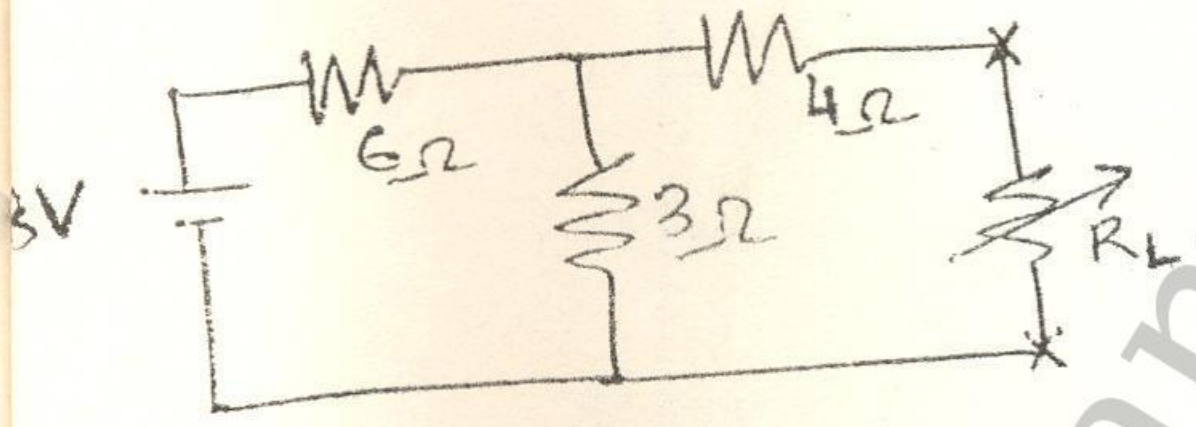


Fig #3

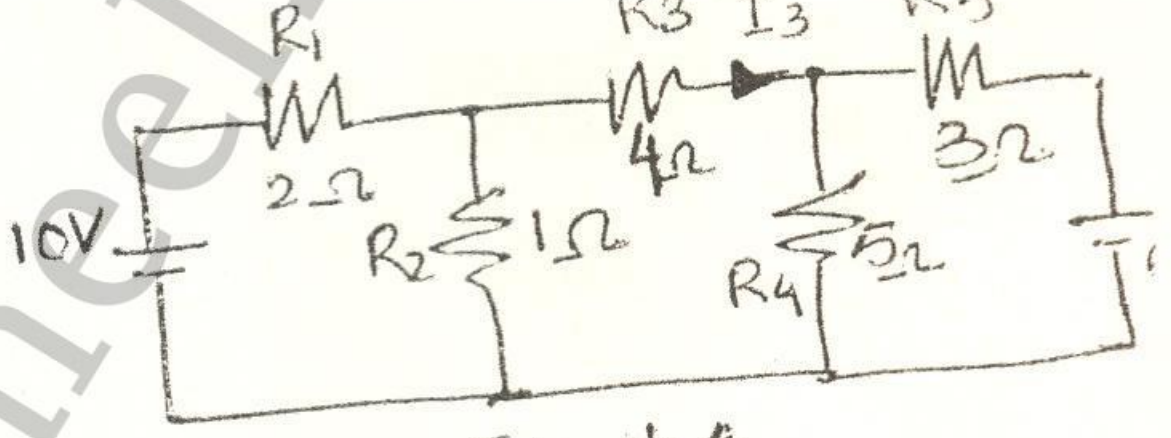


Fig #4

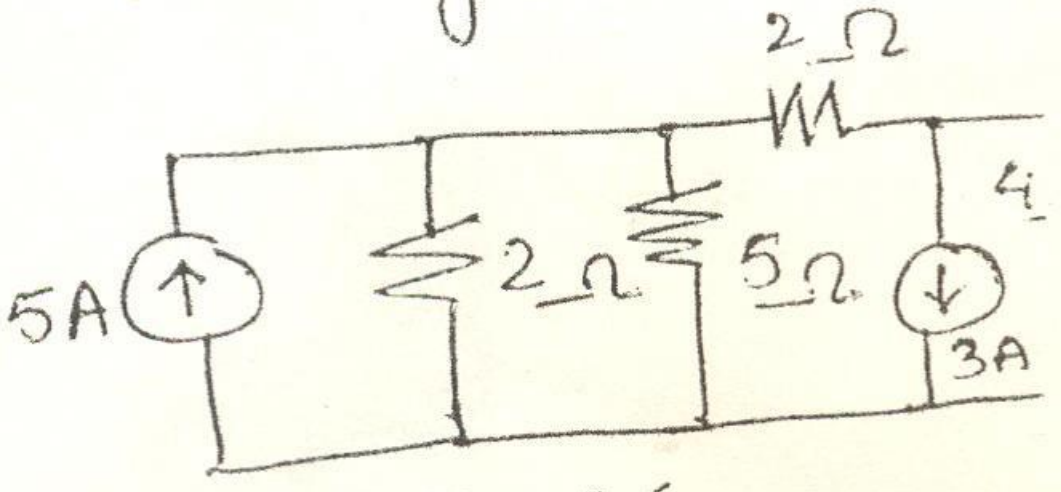


Fig #6

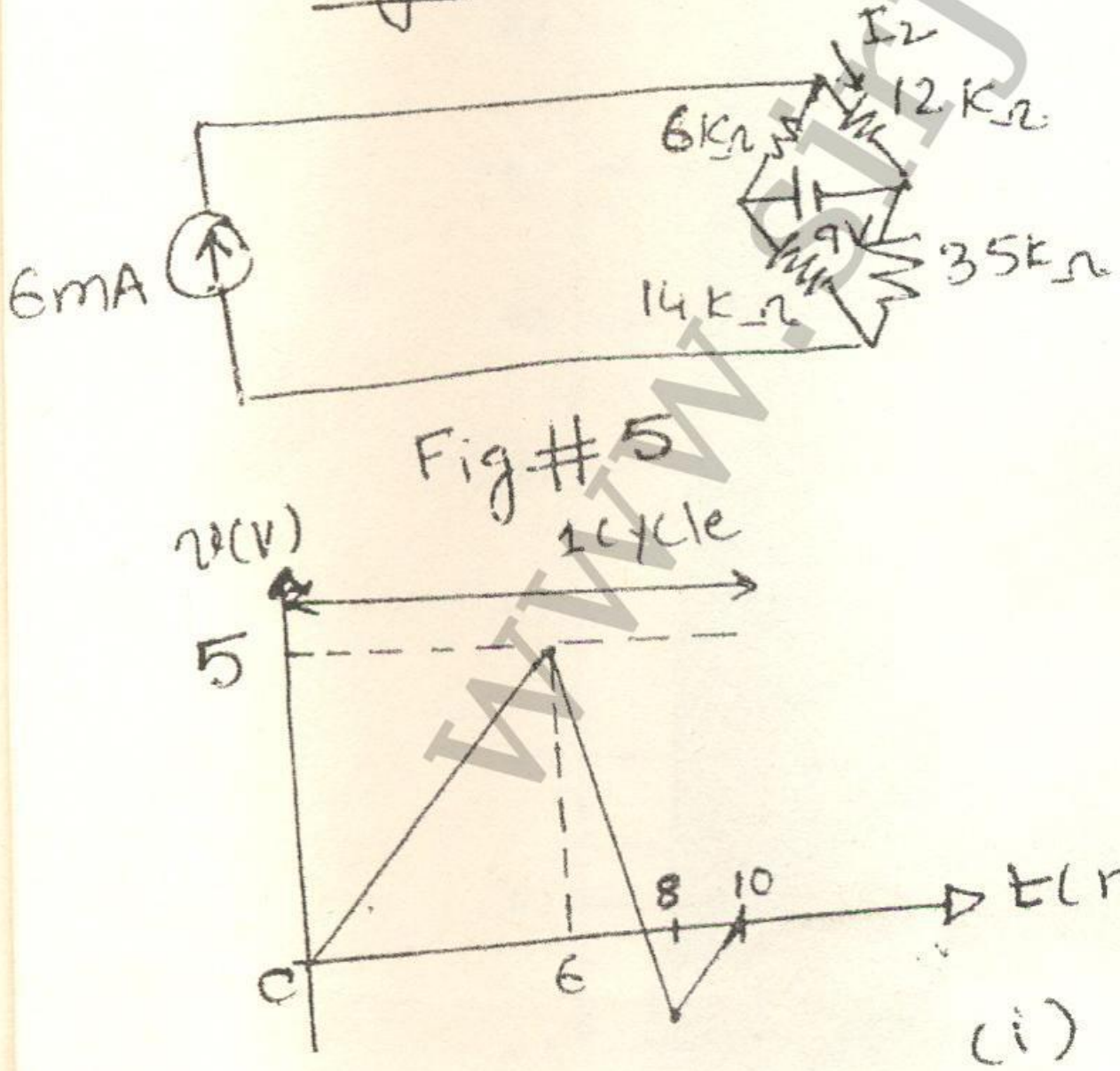


Fig #5

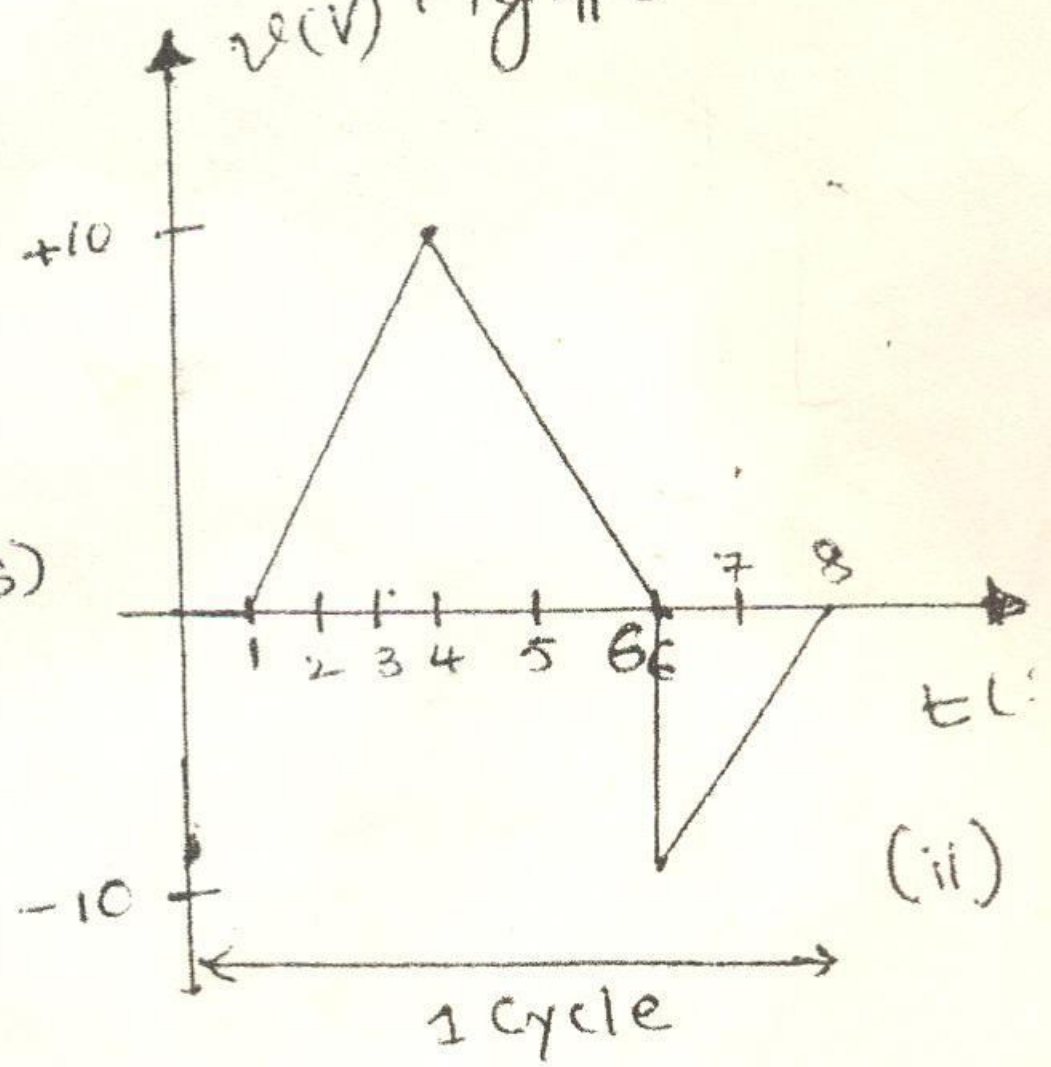


Fig # 7

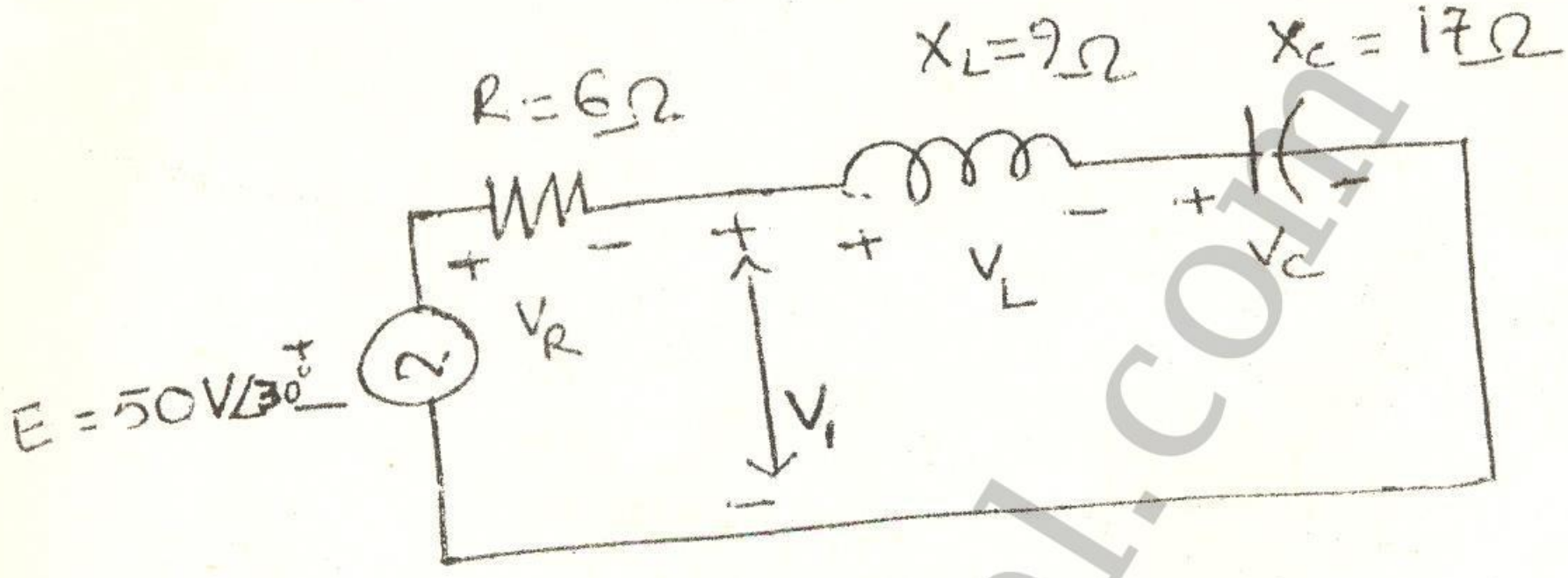


Fig #9

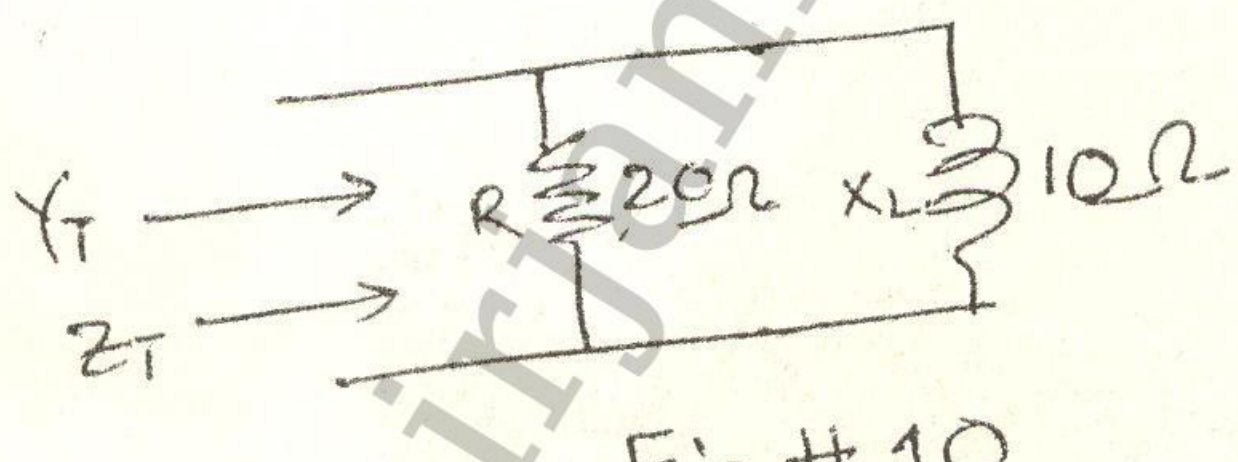


Fig #10

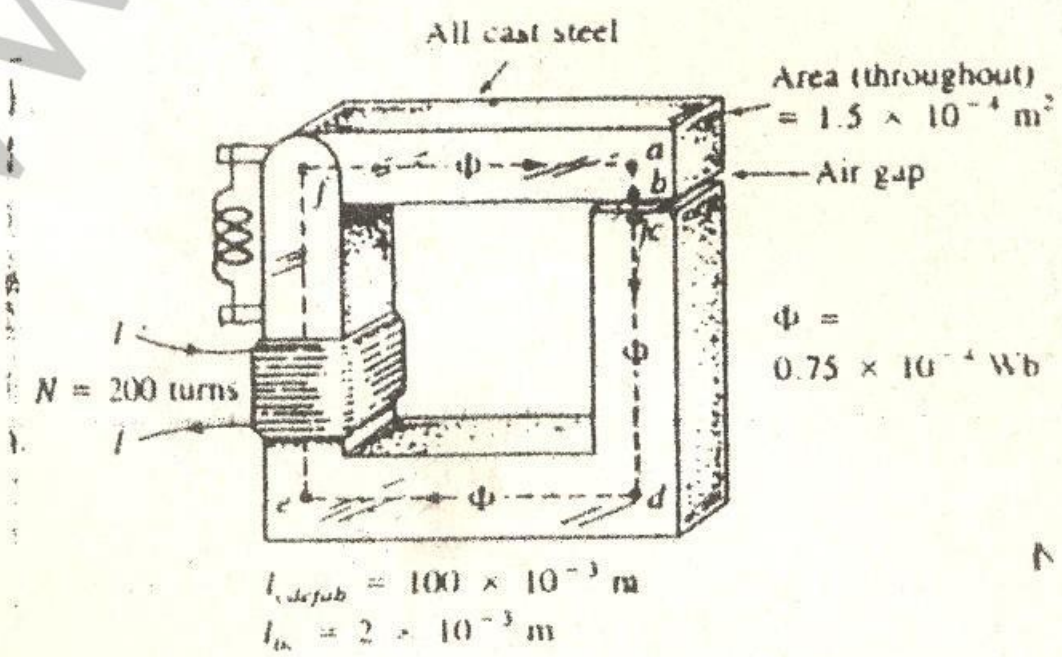


Fig # 11

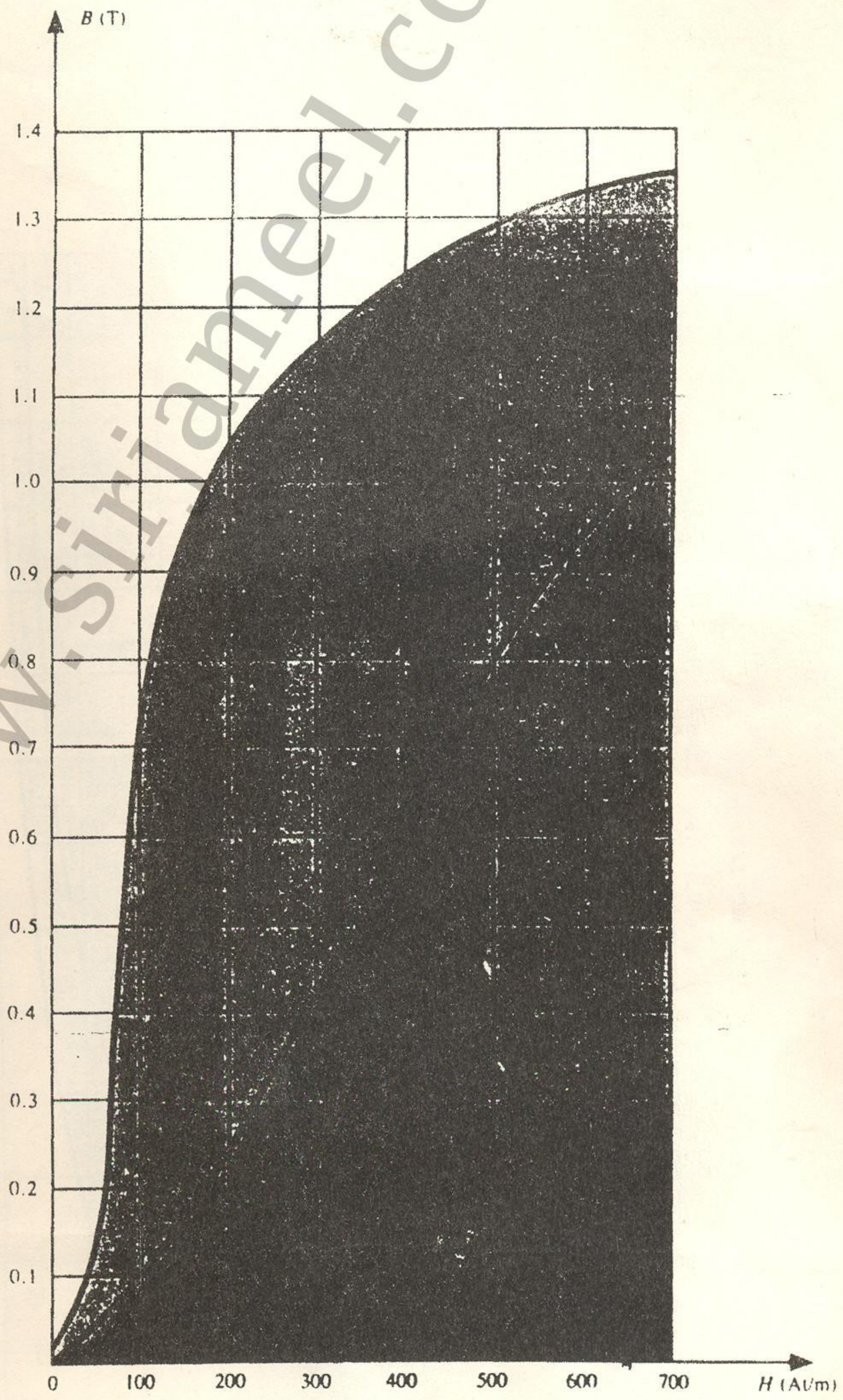


FIG. 11.22

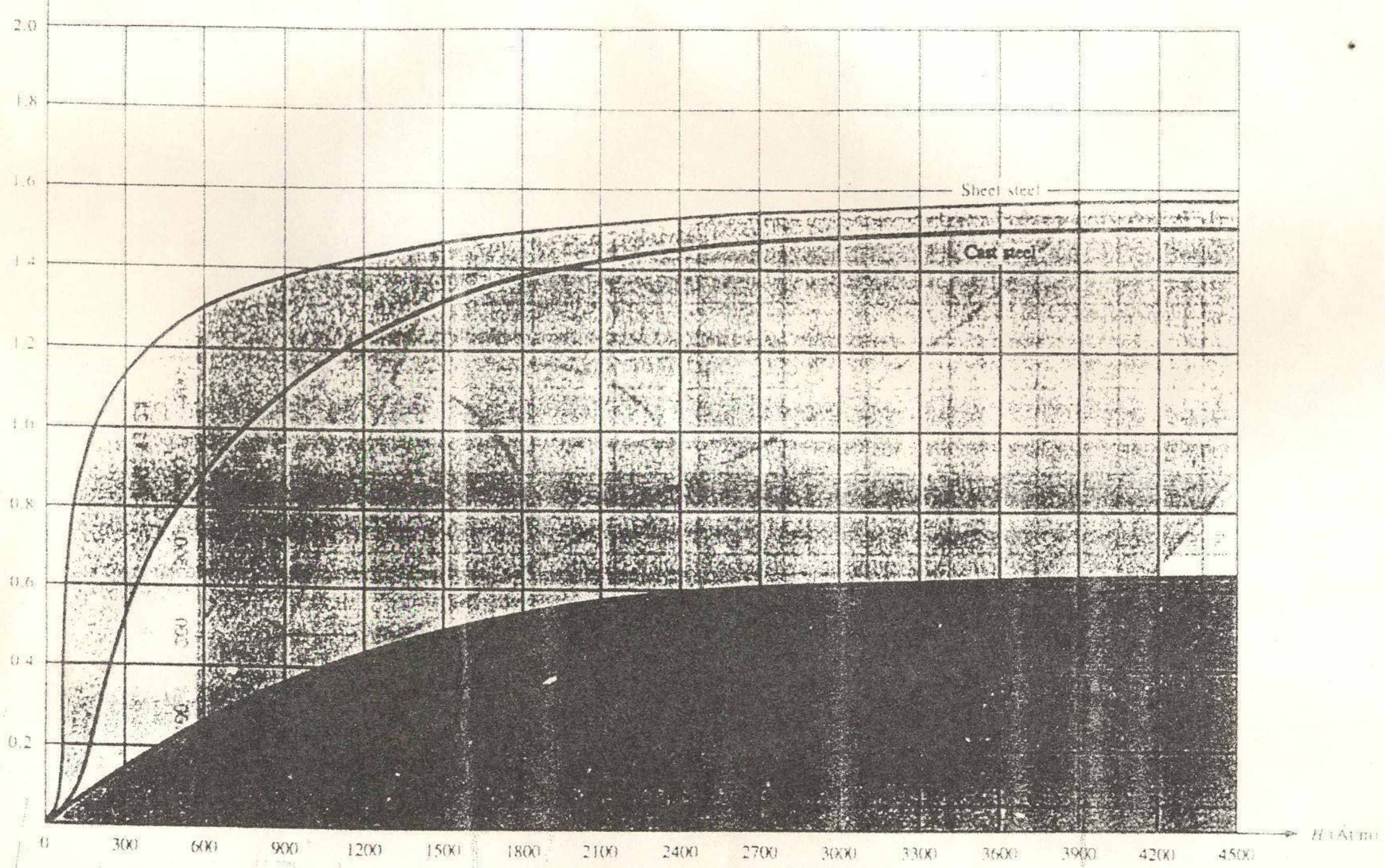


FIG. 11.21