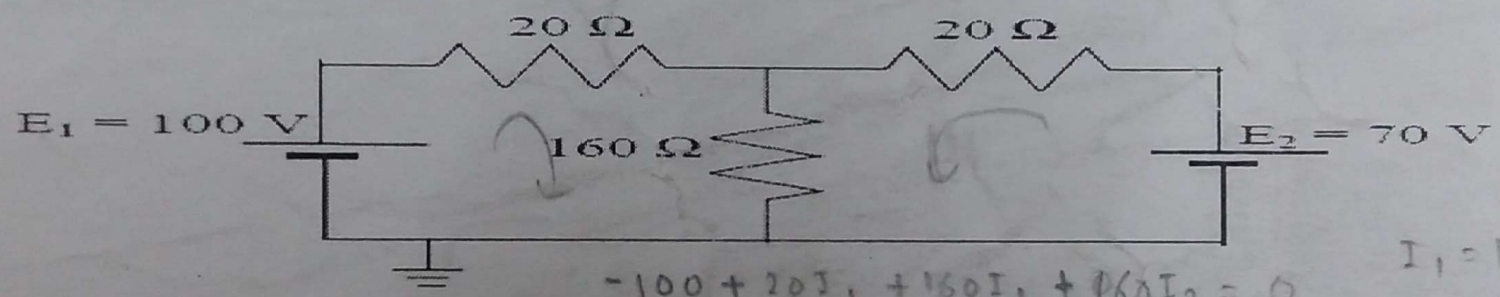
GOVT. COLLEGE OF ENGINEERING, AMRAVATI

{Time= 45 minutes} **Subject: EEU 201Basic Electrical Engineering (CT2)** **{Marks= 08}**

Note: **Attempt any two from Q.1, Q.2, and Q.3**

Q.1 Find the current flowing through 160Ω resistor using Thevnin's Theorem/Norton Theorem--- (4)



$-100 + 20I_1 + 160I_1 + 160I_2 = 0$

$-70 + 20I_2 + 160I_2 + 160I_1 = 0$

$I_1 = 1$

$I_2 = -\frac{1}{2}$

Q.2. Compare Magnetic circuits and Electric circuits in respect of similarities and dissimilarities. *(4)*

Q.3. An iron ring of mean length 60 cm has an air gap of 2mm. It is wound with 300 turns of wire. If the relative permeability of iron is 300 when a current of 0.7 A flows through the coil, find the flux density? ------ (4)

GOVERNMENT COLLEGE OF ENGINEERING, AMRAVATI

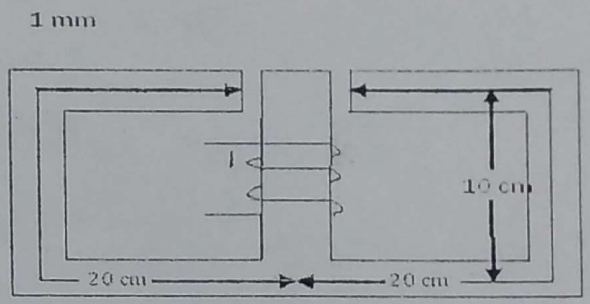
DEPARTMENT OF ELECTRICAL ENGINEERING

CLASS TEST – II

SEM: II COURSE: BASIC ELECTRICAL ENGINEERING (EEU 201) MAX MARKS: 08 DURATION: 1 Hr.

Q.No.1. A magnetic circuit made of wrought iron is shown in following fig. It has two air gaps, each **1 mm** wide. The cross sectional area of the central limb is **6 cm²** and each outer limb is **4 cm²**. If the coil wound on the central limb has **500 turns**, calculate the exciting current required to produce a flux of **0.9 m Wb** in it. The magnetizing curve for wrought iron gives [03 Marks]

B(Wb/m²)	1.125	1.5
H(AT/m)	500	2000



Q.No.2. The coefficient of coupling between two coils is **0.75**. When a current of **3 A** flows in the first coil having **250 turns**, the total flux produced in this coil is **4 mWb**. When this current is linearly changed from **3 A** to **zero** in **3 ms**, the voltage induced in the second coil is **70 V**. Determine **L_1, L_2, M and N_2**. [02 Marks]

Q.No.3. Derive the expression for **energy stored in a magnetic field** and explain the following terms:
i) coefficient of self inductance ii) coefficient of mutual inductance. [03 Marks]

OR

Q.No.4. State any three points of similarity and three points of dissimilarity between Electric and Magnetic Circuit. Explain the following terms:
i) leakage factor ii) retentivity iii) fringing [03 Marks]

$\frac{210 \times 10^{-3}}{0.7 \times 4 \times 10^{-3}} = N_2$

$M = \frac{N_2 \phi_1}{I_1}$

$M_2 = \frac{N_2 \phi_2}{I_1} \quad K_1 \phi$

$= \frac{N_2 K \phi_1}{I_1}$

GOVT. COLLEGE OF ENGINEERING, AMRAVATI

{Time= 1 hour} **Subject: Basic Electrical Engineering (CT2)**

Note: Q.1 Compulsory
Attempt any two from Q.2, Q.3, and Q.4

Q.1 Compare Magnetic circuits and Electric circuits in respect of similarities and dissimilaritie

Q.2 A coil of 1,000 turns is wound on a laminated core of steel having a cross- section of 5 cr an air gap of 2mm cut at right angle. What value of current is required to have an air gap fl T? Permeability of steel may be taken as infinity. Determine the coil inductance.

Q.3 Two coils have a mutual inducatnace of 0.3H. If the current in one coil is varied from 5A to calculate
(i) the average emf induced in the second coil (ii) the change of flux linked (rate of change) coil assuming that it is wound with 200 turns.

Q.4 A coil of insulated wire of 500 turns and of resistance 4 Ω is closely wound on iron ring. Th mean diameter of 0.25 m and a uniform cross-sectional area of 700 mm^2. Calculate the tota ring when a dc supply of 6 V is applied to the ends of winding. Assume a relative permabili