



VIT[®]

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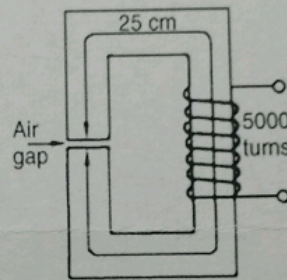
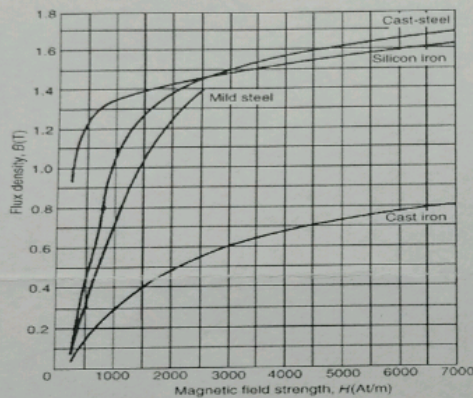
School of Electronics Engineering

Fall Semester 2023-24 (CAT-II)

Course Code : BEEE102L
Course Name : Basic Electrical and Electronics Engineering
Faculty Name : Dr. Palla Penchalaiah, Dr V Velmurugan

Duration : 90 Minutes.
Slot : G2+TG2
Max. Marks: 50M

S.No Question Marks
1 A section through a magnetic circuit of uniform cross-sectional area 2 cm^2 is shown in figure The cast steel core has a mean length of 25 cm . The air gap is 1 mm wide and the coil has 5000 turns. The B-H curve for cast steel is also shown. Determine the current in the coil to produce a flux density of 0.80 T in the air gap, assuming that all the flux passes through both parts of the magnetic circuit.



Leq A =

2 The total inductance of two coils, A and B, when connected in series, is 0.6 H or 0.1 H , depending on the relative directions of the current in the coils. Coil A, when isolated from coil B, has a self-inductance of 0.2 H . Calculate
(a) Mutual inductance between the two coils
(b) Self-inductance of coil B
(c) Coupling factor between the coils.
(d) Two possible values of the induced e.m.f. in coil A when the current is decreasing at 500 A per second in the series circuit.

3 a) Convert the decimal number 92.85 into its binary, hexadecimal and octal equivalents.
b) Convert the following numbers into their binary equivalents
(i) $(AE.12)_{16}$
(ii) $(67.125)_8$

4 Plot the logical expression below on a four-variable Karnaugh map.
 $F(A, B, C, D) = ABCD + AB'C'D' + AB'C + AB$
Obtain the simplified expression. Implement the simplified expression using logic gates.

5 Design for scenario that a committee of three individuals decide issues for an organization. Each individual votes either yes or no for each proposal that arises. A proposal is passed if it receives at least two yes votes. Design a circuit that determines whether a proposal passes.