G24102

VIT
Vellore Institute of Technology

School of Electrical Engineering

Continuous Assessment Test-II **Programme: B.Tech** **Winter Semester 2023-2024**

Course Code: BEEE102L **Course: Basic Electrical and Electronics Engineering**

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Class Number(s): VL2023240504779/4782/4770/4769/4765/4768/6389/4766/4780/4773

Date of the Examination: -7th April 2024 (9.30 am to 11 am)

Duration: 90 minutes **Max. Marks : 50**

General instruction(s): Answer all the Questions

Assumptions can be made wherever necessary

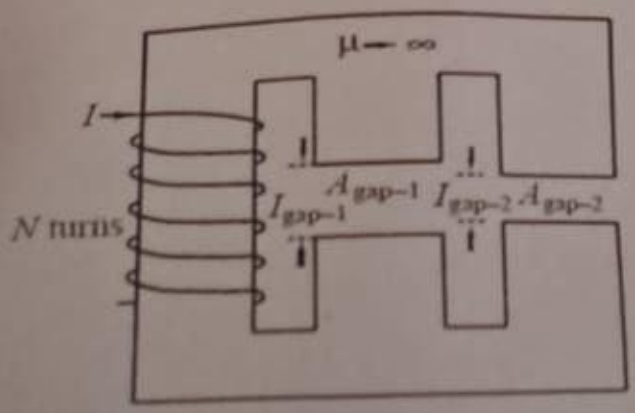
Q. No	Question	Marks
1.	(i) A steel ring of 20 cm mean diameter and circular cross section of diameter 2.5 cm has an air gap of 1 mm. The ring is uniformly wound with 500 turns of copper wire carrying a current of 5 A. Assume that the steel ring takes 40% of the total magneto-motive force.Calculate the (a) magneto motive force, (b) magnetic flux, (c) flux density and (d) reluctance of steel and air gap. Neglect magnetic leakage and fringing effect.	8+2
	(ii) Discuss the physical significance of coefficient of coupling when equal to (i) zero (ii) one.	
2		10

Figure 1

For the given magnetic structure shown in Figure 1, (i) draw the electrical equivalent (ii) Write the expression for reluctance of the two air gaps (iii). Give True or False for the following statement and give your comment: "flux remains same in both the air gaps". (iv) Discuss the relation between the total flux generated by the coil and the flux in the air gaps.