Roll No:

KARPAGAM COLLEGE OF ENGINEERING, COIMBATORE -641032.

BE-ELECTRICAL AND ELECTRONICS ENGINEERING Semester: III

15LC10/15TC10 ELECTRICAL ENGINEERING

Continuous Internal Assessment: I

Date:12/2/2016 **Time: Two Hours**

Session:AN **Maximum: 50 Marks**

Answer ALL Questions **PART-A** **(10 x 2 = 20)**

A1. Fill the blank, 1 weber = _____lines of force.

A2. Define magnetic flux density and magnetic field strength.

A3. What is Fleming's left hand rule?

A4. Calculate the force experienced by the conductor of 20cm long, carrying 50 amperes, placed at right angles to the lines of force of flux density $10X10^{-3}\frac{Wb}{m^2}$.

A5. Express reluctance in terms of MMF.

A6. A current of 2 amps is flowing through each of the conductors in a coil containing 15 such conductors. If a point pole of unit strength is placed at a perpendicular distance of 10 cm from the coil, determine the field intensity at that point.

A7. Define Permeability of free space or vacuum.

A8. What is the difference between dynamically induced e.m.f and statically induced e.m.f?

A9. State Lenz's law.

A10. Give the expression for self inductance and mutual inductance.

Answer ALL Questions **PART-B** **(2x15 = 30)**

B1. (a) (i) Derive the expression for mmf,reluctance and flux for series magnetic circuit. Also draw its electrical equivalent circuit. (6)

(ii) An Iron ring of circular cross sectional area of 3.0 cm^2 and mean diameter of 20 cm is wound with 500 turns of wire and carries a current of 2.09 A to produce the magnetic flux of 0.5 m Wb in the ring. Determine the permeability of the material. (5)

(iii) Mention any four similarities of Magnetic and Electric Circuits (4)

(OR)

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(iii) Mention any four similarities of Magnetic and Electric Circuits (4)

(OR)

(b) (i) Derive the expression for mmf,reluctance and flux for parallel magnetic circuit. Also draw its electrical equivalent circuit. (6)

(ii) An iron ring 8 cm mean diameter is made up of round iron of diameter 1 cm and permeability of 900, has an air gap of 2mm wide. It consists of winding with 400 turns carrying a current of 3.5A. Determine m.m.f, total reluctance and the flux. (5)

(iii) Explain the force experienced by the conductor with neat diagrams. (4)

B2. (a) (i) Derive the expression for magnitude of self induced e.m.f (6)

(ii) If a coil of 500 turns is linked with a flux of 50 m Wb, when carrying a current of 125 A. Calculate the inductance of the coil. If this current is reduced to zero uniformly in 0.1 sec,calculate the self induced e.m.f. (5)

(iii) State Faraday's laws of Electromagnetic induction. (4)

(OR)

(b) (i) Derive the expression for magnitude of mutually induced e.m.f (6)

(ii) Derive the expression for co-efficient of coupling (5)

(iii) Discuss the various factors affecting self inductance of a coil. (4)

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