GANPAT UNIVERSITY
U. V. PATEL COLLEGE OF ENGINEERING
B.TECH. SEM-I
2ES103: BASIC OF ELECTRICAL ENGINEERING
CH. 3 MAGNETIC CIRCUIT
6: ASSIGNMENT &TUTORIAL

Part – I Multiple Objective Questions (MCQ)

1. The induced voltage across a coil with 250 turns that is located in a magnetic field that is changing at a rate of 8 Wb/s is

A)	1,000 V	**B)**	2,000 V
C)	31.25 V	**D)**	3,125 V

2. For a given wire wound core, an increase in current through the coil

A)	reverses the flux lines	**B)**	decreases the flux density
C)	increases the flux density	**D)**	causes no change in flux density

3. If the cross-sectional area of a magnetic field increases, but the flux remains the same, the flux density

A)	Increases	**B)**	decreases
C)	remains the same	**D)**	doubles

4. The unit for reluctance is

A)	Tesla	**B)**	At/Wb
C)	At/m	**D)**	Wb

5. There is 900 mA of current through a wire with 40 turns. What is the reluctance of the circuit if the flux is 400 µWb?

A)	14,400 AT/Wb	**B)**	1,440 AT/Wb
C)	9,000 AT/Wb	**D)**	90,000 AT/Wb

6. What is the magnetomotive force in a 75-turn coil of wire when there are 4 A of current through it?

A)	18.75 AT	**B)**	30 AT
C)	300 AT	**D)**	187 AT

7. The ability of a material to remain magnetized after removal of the magnetizing force is known as

A)	Permeability	**B)**	reluctance
C)	Hysteresis	**D)**	retentivity

8. The B-H curve of _____ will not a straight line.

A)	Air	**B)**	Copper
C)	Wood	**D)**	Soft iron

9. What is the flux density in a magnetic field in which the flux in 0.1 m^2 is 600 µWb?

A)	6,000 µT	**B)**	6,00 µT
C)	6,0 µT	**D)**	6 µT

10. The SI unit ofreluctance is

A)	AT/Wb	**B)**	AT/m
C)	AT	**D)**	N/Wb

Part – II Shorts Questions(1 & 2 Marks)(Only for Preparation)

1. What do you mean by magnetic circuit?
2. Define following terms:
    (i)   Useful flux

     (ii)   Leakage Flux
     (iii)   Reluctance
     (iv)   Magnetic fringing
     (v)   Magnetic flux density
     (vi)   Magnetic field intensity
     (vii)   Permeability

3. Only write the relation between B and H.
4. What is difference between reluctance and permeance?

Part – IIIExamples

1. Find the AT required to magnetise up to 1.6 Wb/m^2 a soft iron ring made of round iron 5 cm thick and 50 cm mean diameter. Permeability μ_r of soft iron is 800.

                                                                ANS: 25 x 10^4 AT

2. An iron ring of mean diameter 10 cm and area of cross section 2.5 cm^2 has a saw cut of 2 mm in it. The ring is wound with a coil of 1000 turns carrying a current 0.1 A. Assuming relative permeability of iron to be 800, determine the flux density in the air gap. Neglect leakage.

                                                     ANS: 0.05257 Wb/m^2

3. A ring composed of three sections. The cross-sectional area is 0.001 m^2 for each section. The mean arc length are la = 0.3 m, lb = 0.2 m, lc = 0.1 m. An air-gap length of 0.1 mm is cut in the ring. µr for sections a, b, c are 5000, 1000, and 10,000 respectively. Flux in the air gap is $7.5 \times 10{-}4$ Wb. Find (i) mmf (ii) exciting current if the coil has 100 turns.

                                     ANS:(i) 221 amp-turns (ii) 2.21 amp

Part – IV Long Questions(Only For Preparation)

1. Derive an expression for ampere turns for simple & composite magnetic circuit.
2. Explain B-H curve for magnetic material.
3. Bring out the analogy between electric and magnetic circuit.
4. What is leakage coefficient? How does it affect the magnetic circuit? What are its disadvantages?

*Notes: Students have to write only Part I and Part III.