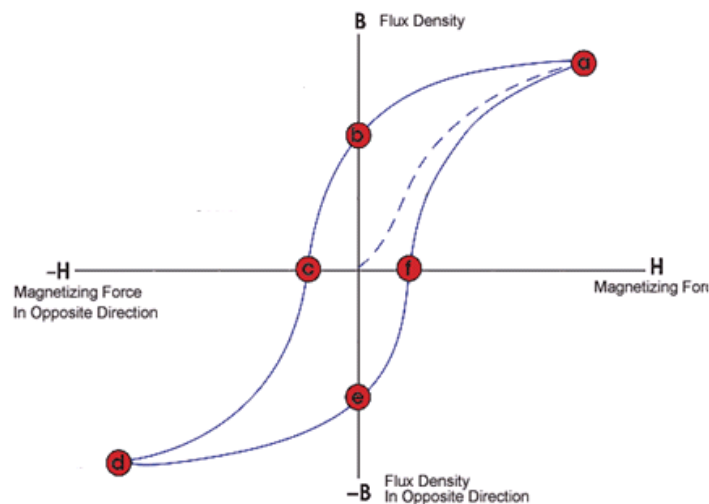


## Tutorial Discussions for Electrical and Magnetic Methods.

1. Discuss the importance of demagnetization of a ferromagnetic component (magneto-statics Slides 70 and 71).
2. Explain the relationship between magnetic Field orientation and the ability to detect flaws in a magnetic flux leakage inspection (magneto-statics Slides 62, 63 and 64).
3. Describe and compare the direct and indirect induction methods used when performing an MPI inspection (magneto-statics Slides 65 – 68). Give an example of how these would be implemented in practice (magneto-statics Slides 77 – 79).
4. Identify and discuss the 4 distinct regions of a normal magnetization curve that are used to describe the changes to magnetic materials magnetic domains.
5. For the hysteresis loop given in the following figure, name and describe the labeled points (magneto-statics Slides 27 - 34).



6. What are the main properties of a ferromagnetic material and how do they differ from diamagnetic and paramagnetic materials (magneto-statics Slides 9 – 20).
7. Describe how mutual inductance forms the basis of the eddy current inspection method (Eddy Current Slides 36 - 41).
8. By applying Lenz's law, explain how inductive reactance reduces the current flow in a circuit (Eddy Current Slides 32 – 35).
9. With reference to induced eddy currents in a conductor, explain the skin effect and effective depth of penetration (Eddy Current Slides 57 – 62).
10. Define Phase Lag and describe how it can be useful in determining the depth of a discontinuity (Eddy Current Slides 63 – 65).
11. Why would you use shielding or loading of an eddy current probe (Eddy Current Slides 85 – 88).