

J.C. Bose University of Science & Technology YMCA, Faridabad  
Sessional-2<sup>nd</sup>  
B. Tech. (Mechanical Engineering) 2<sup>nd</sup> semester  
Introduction to Electromagnetic Theory (BSC-101 A)

Time: 1hr 30 min.

M. Marks: 15

Note: All questions are compulsory.

- Q. 1 (a) Derive an expression for boundary conditions in a magnetic field. (3)  
(b) Explain electromagnetic breaking and its application. (2)
- Q. 2 (a) Obtain an expression for the magnetic flux density at a point due to an infinitely long straight current-carrying conductor. (2.5)  
(b) Discuss Faraday's law in terms of motional EMF. (2.5)
- Q. 3 .. A square loop of wire (side a) lies on a table, a distance S from a very long straight wire, which carries a current I. (5)  
a. Find the flux of B through the loop.  
b. If someone now pulls the loop away from the wire, at speed v, what emf is generated?