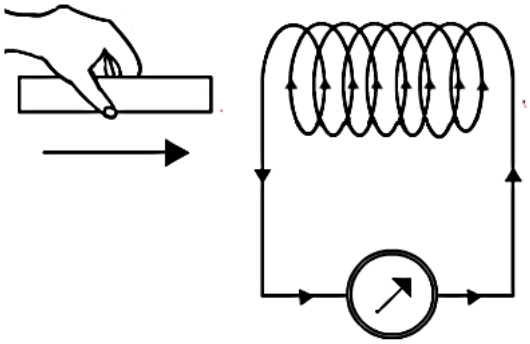
Electromagnetism: Exam Revision Tracker

Attempt #1		Attempt #2		Attempt #3		Attempt #4		Attempt #5	
Total	Score	Total	Score	Total	Score	Total	Score	Total	Score
15		10		10		13		11	
Percentage =		Percentage =		Percentage =		Percentage =		Percentage =	

Electromagnetism: Attempt #1

Total = 15 Marks

In the diagram below a bar magnet is being pushed into a coil. The current induced in the coil is in the direction indicated.



1. Write down the polarity (north pole or south pole) of the end of the coil facing the bar magnet, as the bar magnet approaches the coil. (2)

2. Which end of the bar magnet is approaching the coil? Write down only NORTH POLE or SOUTH POLE (1)

3. Write down what will be observed on the galvanometer if the bar magnet is held stationary inside the coil. Give a reason for the answer. (2)

Faraday's law of electromagnetic induction plays a very important role in the generation of electricity.

4. Write down Faraday's law of electromagnetic induction in words. (2)

A coil of 100 turns, each of area $4{,}8 \times 10^{-4}$ m^2, is made from insulated copper wire. The coil is placed in a uniform magnetic field of 4×10^{-4} T in such a way that the angle between the magnetic field and the normal to the plane of the coil is 30°. The coil is then rotated so that the angle changes to 70° in a time interval of 0,2 s.

Calculate the:

5. Magnitude of the emf induced in the coil (5)

6. Current induced in the coil if it has an effective resistance of 2 Ω (3)

Electromagnetism: Attempt #2 ⚡

Total = 10 Marks

A single circular loop of wire, 12 cm in diameter, is placed in a 0,6 T magnetic field. It is removed from the magnetic field in 0,04 s.

1. Calculate:

1.1 The flux which is linked to this coil. (4)

1.2 The average induced emf. (4)

2. How does the *emf* change if …

(Write only INCREASES, DECREASES or REMAINS THE SAME)

2.1 the magnetic field strength changes to 0,5 T? (1)

2.2 the coil is removed from the field in 0,02 s? (1)

Electromagnetism: Attempt #3 ⚡

Total = 10 Marks

An emf of 0,25 V is induced in a solenoid of 200 turns when it is pulled out of a magnetic field of 0,8 T at an angle θ in 0,01 second. The radius of the solenoid is 1 mm.

1. State Faraday's law in words. (2)

2. Calculate the …

2.1 change in magnetic flux linkage (Φ) with the solenoid. (3)

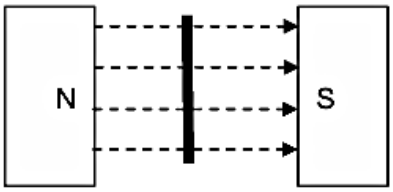
2.2 angle θ at which the solenoid is pulled out of the magnetic field. (4)

3. A second solenoid of a bigger cross section is now pulled out of the same magnetic field at the same angle. How will the emf induced in the second solenoid compare with that in the first solenoid? Write only INCREASE, DECREASE or REMAIN THE SAME. (1)

Electromagnetism: Attempt #4 ⚡

Total = 13 Marks

A SQUARE induction coil with a side length 3 cm and 400 windings, is placed perpendicularly in a uniform magnetic field and then rotated through an angle of 45º in 0,08 s.



An emf of 7 V is induced in the coil.

1. State *Faraday's law of electromagnetic induction* in words. (2)

2. Calculate the change in the magnetic flux. (3)

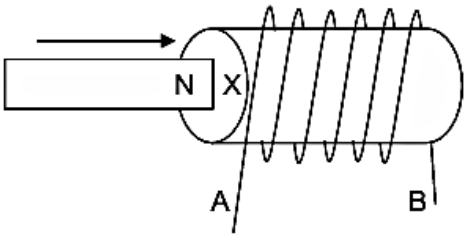
3. Calculate the magnitude of the magnetic field. (4)

The coil is now rotated through an angle of 45º in 0,05 s.

4. How will the induced emf be affected? Write only INCREASE, DECREASE or STAY THE SAME. (1)

5. Explain the answer to QUESTION 11.4. (1)

The north pole of a bar magnet is pushed into a solenoid, as shown in the sketch below.



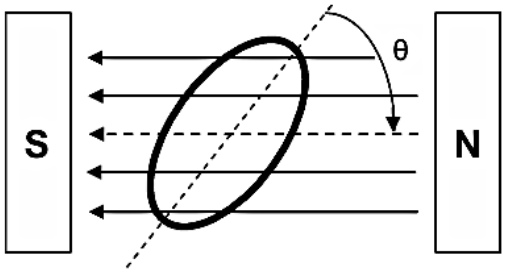
6. Which pole will be induced at point X? Write only NORTH or SOUTH. (1)

7. In which direction will the induced current flow? Write only FROM A TO B or FROM B TO A. (1)

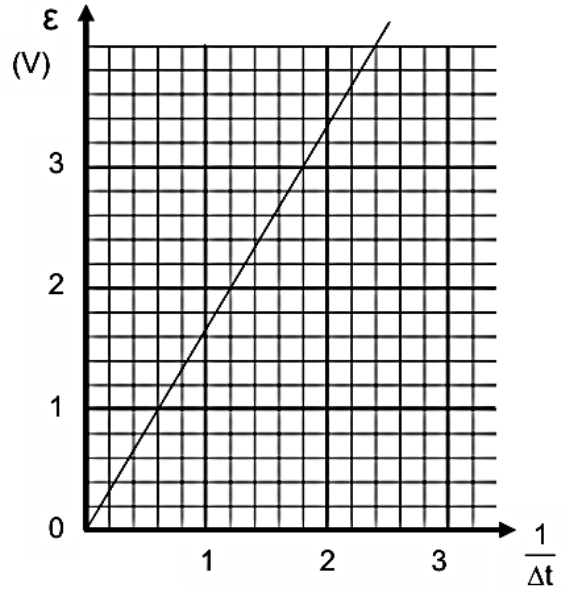
Electromagnetism: Attempt #5

Total = 11 Marks

An induction coil of area 48,6 cm^2 and 200 windings is rotated clockwise in a constant magnetic field of magnitude 2,4 T. Refer to the diagram below.



The graph below shows how the induced emf varies with the inverse of time.



1. State *Faraday's law* in words. (2)

2. Use the information in the graph to calculate the change in magnetic flux. (5)

3. The coil rotates through an angle θ to a position where the magnetic flux becomes zero. Calculate angle θ. (4)