A Level · OCR · Physics

4 mins 4 questions

Multiple Choice Questions

Electromagnetic Induction

Magnetic Flux / Magnetic Flux Linkage / Faraday's & Lenz's Laws / Calculating Induced E.m.f / A.C Generator / Transformers

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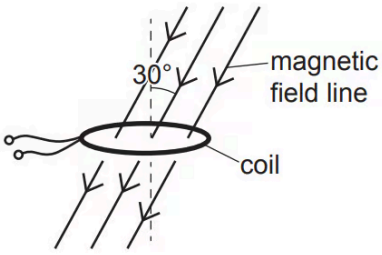
Total Marks /4

1 A flat coil has 200 turns and a cross-sectional area of 1.20×10^{-4} m^2.



The coil is placed horizontally in a uniform magnetic field. The magnetic flux density is 0.050 T. The magnetic field is at an angle of 30.0° to the vertical.

What is the magnetic flux linkage for this coil?

A. 3.00×10^{-6} Wb turns

B. 5.20×10^{-6} Wb turns

C. 6.00×10^{-4} Wb turns

D. 1.04×10^{-3} Wb turns

(1 mark)

2 Faraday's law of electromagnetic induction is written below with **two** terms missing.

The ..... induced in a circuit is directly proportional to the rate of change of magnetic flux ..... .

What are the **two** missing terms?

A. current, density

B. current, linkage

C. electromotive force, density

D. electromotive force, linkage

(1 mark)

3 A coil with 500 turns is placed in a uniform magnetic field. The average cross-sectional area of the coil is 3.0×10^{-4} m^2.
The magnetic flux through the plane of the coil is reduced from 1.8×10^{-4} Wb to zero in a time *t*. The average electromotive force (e.m.f.) induced across the ends of the coil is 0.75 V.

What is the value of *t*?

A. 3.6×10^{-5} s

B. 2.4×10^{-4} s

C. 0.12s

D. 8.3s

(1 mark)

4 The number of turns on the coils of four ideal iron-cored transformers **A, B, C** and **D** are shown in the table below.

Transformer	Number of turns on the secondary coil	Number of turns on the primary coil
A	100	100
B	50	200
C	200	50
D	500	100

Each transformer is connected in turn to an alternating 240 V supply.

Which transformer will give the largest output current?

(1 mark)