

**O Level Pure Physics MCQs**

**Electromagnetic Induction Test 3.0**

Q1

Diagram 1 shows the oscilloscope trace produced by an input of voltage 2.0 V and frequency 50 Hz.

Without changing the input, the Y-gain and time base of the oscilloscope are then adjusted and the waveform as shown in Diagram 2 is then obtained.

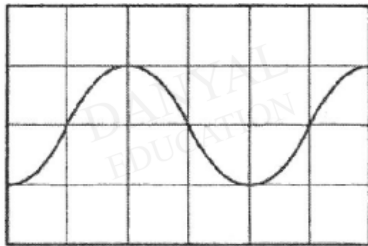


Diagram 1

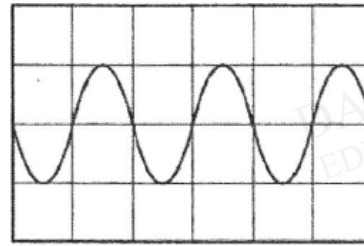


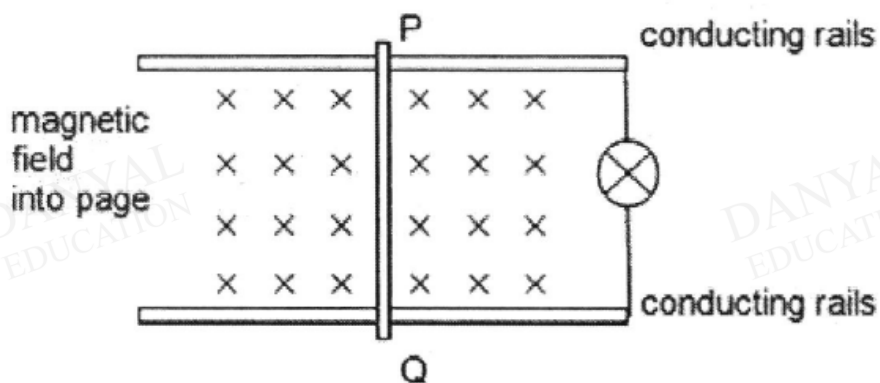
Diagram 2

Which adjustments were made to the Y-gain and time base that resulted in the waveform as shown in Diagram 2 to be displayed?

- |   | <u>Y-Gain</u>    | <u>Time base</u>  |
|---|------------------|-------------------|
| A | 1.0 V / division | 5.0 ms / division |
| B | 1.0 V / division | 10 ms / division  |
| C | 2.0 V / division | 5.0 ms / division |
| D | 2.0 V / division | 10 ms / division  |

Q2

A light metal rod **PQ** is moved to the right on two conducting rails.

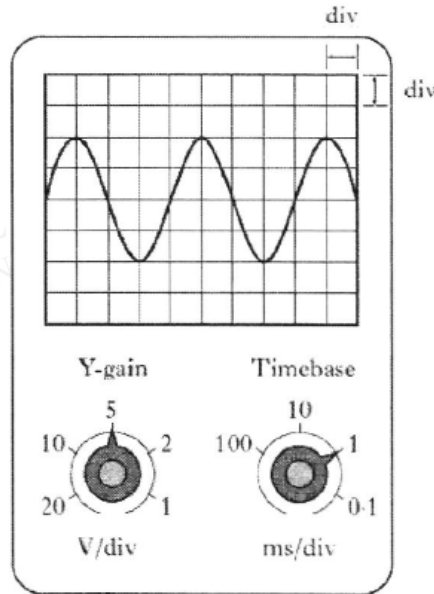


Which statement is correct?

- A P is a higher potential and current flows from P to Q through the rod.
- B P is at a higher potential and current flows from Q to P through the rod.
- C Q is at a higher potential and current flows from P to Q through the rod.
- D Q is at a higher potential and current flows from Q to P through the rod.

Q3

The output from a signal generator is connected to the input terminals of an oscilloscope. The trace observed on the oscilloscope screen, the Y-gain setting and the timebase setting are shown.

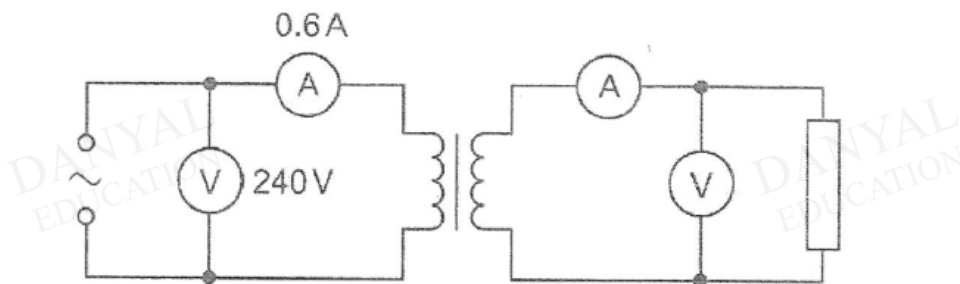


The frequency of the signal shown is calculated using the

- A timebase setting and the vertical height of the trace
- B timebase setting and the horizontal distance between the peaks of the trace.
- C Y-gain setting and the vertical height of the trace
- D Y-gain setting and the horizontal distance between the peaks of the trace

Q4

The diagram shows an ideal transformer connected to a resistor.



Which one of the following shows possible readings for the voltmeter and the ammeter in the output circuit?

	voltmeter reading	ammeter reading
A	40 V	360 mA
B	120 V	300 mA
C	360 V	0.4 A
D	400 V	1 A

Q5

Diagram 1 shows the oscilloscope trace produced by an input of 2 V at 50 Hz.

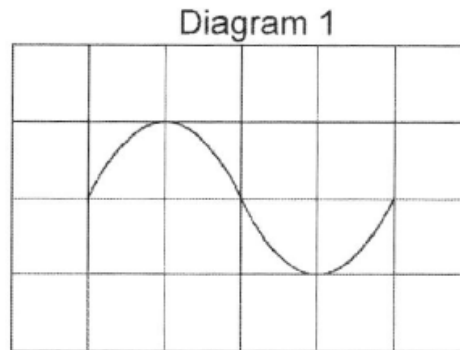
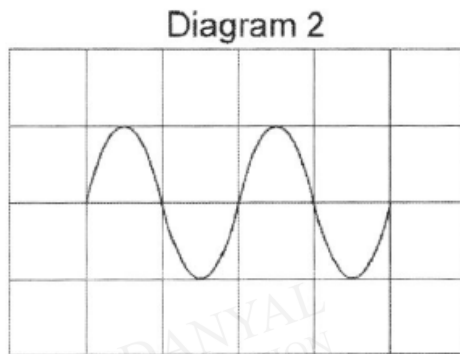


Diagram 2 shows the trace from a different input on the same oscilloscope.



What is the value of the new input?

- A 1V at 50 Hz
- B 2V at 25 Hz
- C 2V at 100 Hz
- D 4V at 50 Hz

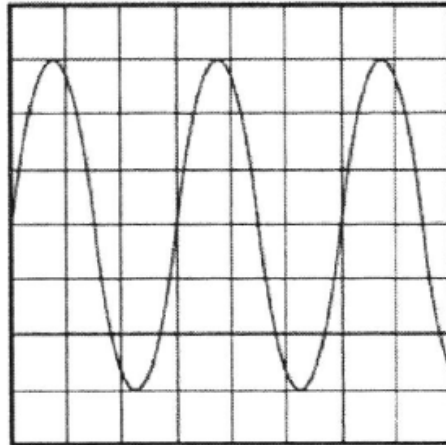
Q6

The soft iron core in a simple transformer is laminated. Why is this so?

- A To direct the changing magnetic field lines from the primary coil to the secondary coil
- B To reduce the amount of thermal energy lost from the soft iron core to the surroundings
- C To increase the number of magnetic field lines in the soft iron core
- D To reduce the chance of a user from being electrocuted

Q7

A sound wave is displayed on the screen of a cathode-ray oscilloscope, as shown.

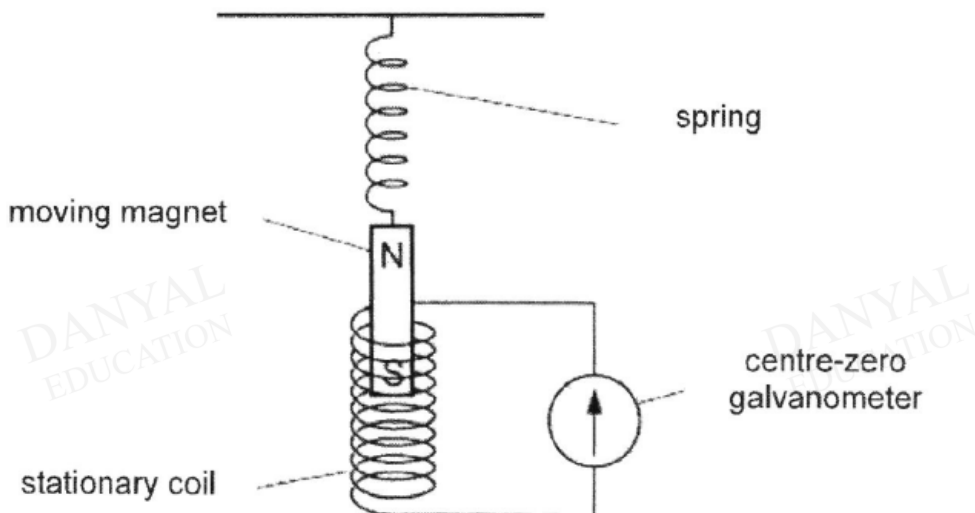


The time-base setting is 0.50 ms per division.  
What is the frequency of the sound wave?

- A 250 Hz
- B 500 Hz
- C 670 Hz
- D 1300 Hz

Q8

A magnet is suspended from a spring so that it can move freely inside a stationary coil. The coil is connected to a sensitive centre-zero galvanometer.

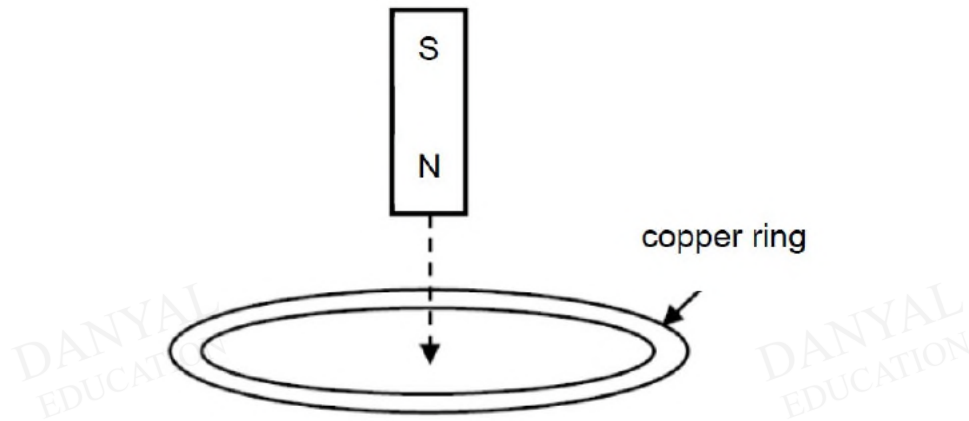


The magnet repeatedly moves slowly up and down.  
What does the galvanometer show?

- A a constantly changing reading
- B a steady reading to the left
- C a steady reading to the right
- D a steady reading of zero

Q9

A magnet is dropped vertically through a copper ring.

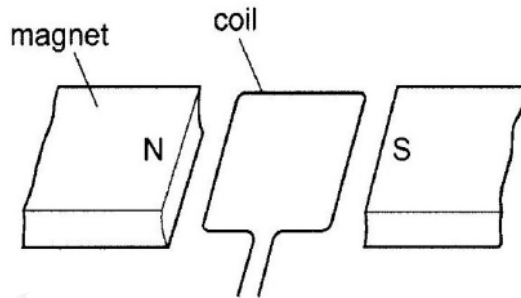


Which of the following statements is **incorrect**?

- A A current flows in the ring just before the magnet passes through the ring.
- B A current flows in the ring just after the magnet passes through the ring.
- C The magnet slows down just before it passes through the ring.
- D The magnet accelerates just after it passes through the ring.

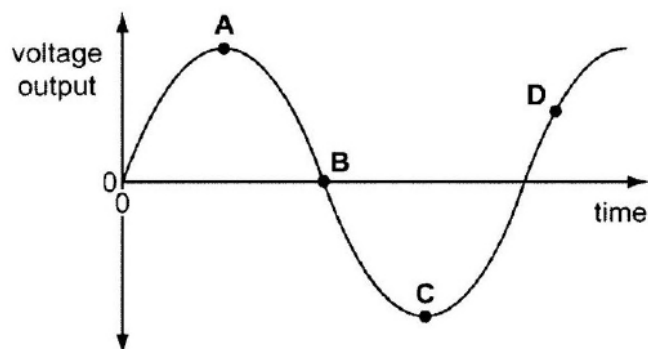
Q10

The diagram shows part of an a.c. generator when its coil is in a horizontal position.



The graph below shows the voltage output plotted against time.

Which point on the graph shows the coil in a vertical position?



**Answers**

**Electromagnetic Induction Test 3.0**

Q1 D

Q2 D

Q3 B

Q4 C

Q5 C

Q6 B

Q7 C

Q8 A

Q9 D

Q10 B

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