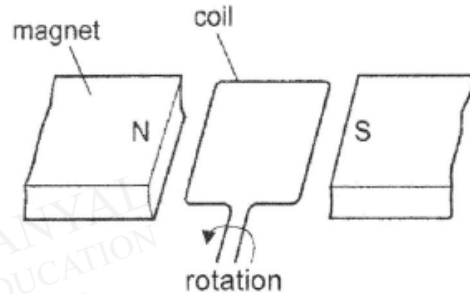


## O Level Pure Physics MCQs

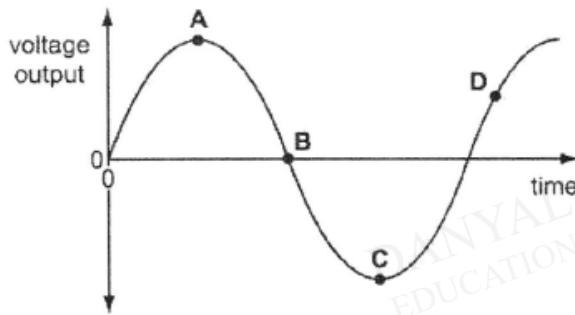
### Electromagnetic Induction Test 1.0

Q1

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

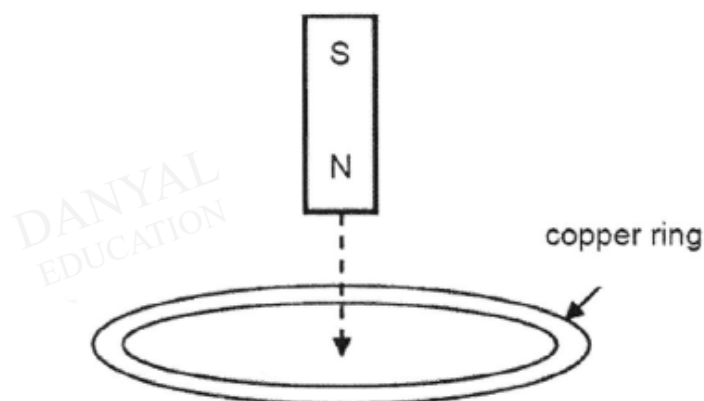


The graph below shows the voltage output plotted against time. Which point on the graph shows the coil in a vertical position?



Q2

A magnet is dropped vertically through a copper ring.

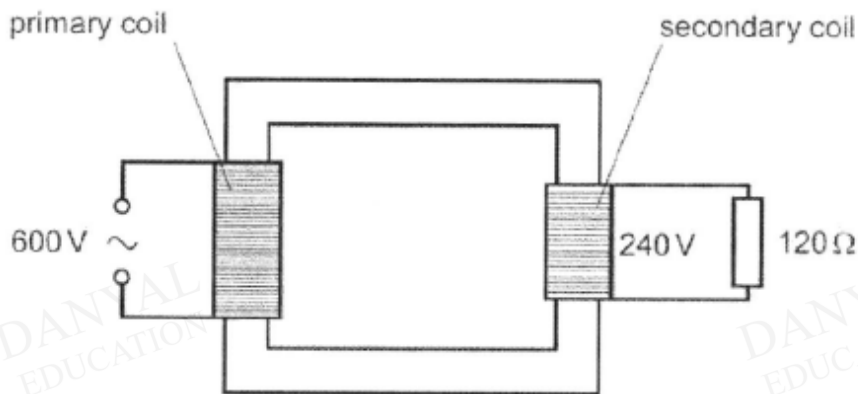


Which of the following statements is **incorrect**?

- 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's acceleration decreases just before it passes through the ring.
- D The magnet decelerates just after it passes through the ring.

Q3

An ideal transformer has a primary voltage of 600 V and a secondary voltage of 240 V. The secondary coil is attached to a resistor of resistance 120  $\Omega$ .



What is the power dissipated in the resistor and the current in the primary coil?

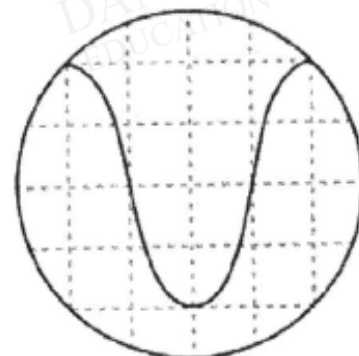
	power / W	current / A
<b>A</b>	120	0.20
<b>B</b>	120	5.0
<b>C</b>	480	0.80
<b>D</b>	480	1.3

Q4

The diagram shows the trace obtained on the screen of an oscilloscope when a given signal is applied to the input terminals. The time-base is set at 2.0 ms / div and the voltage sensitivity is set at 2.0 V / div.

Which of the following correctly represents the peak voltage and frequency of the signal?

	peak voltage / V	frequency / Hz
<b>A</b>	4.0	83.3
<b>B</b>	4.0	125
<b>C</b>	8.0	83.3
<b>D</b>	8.0	125



Q5

Fig. 37.1 shows a transformer. The number of turns between each pair of output terminals of a transformer is shown in the diagram.

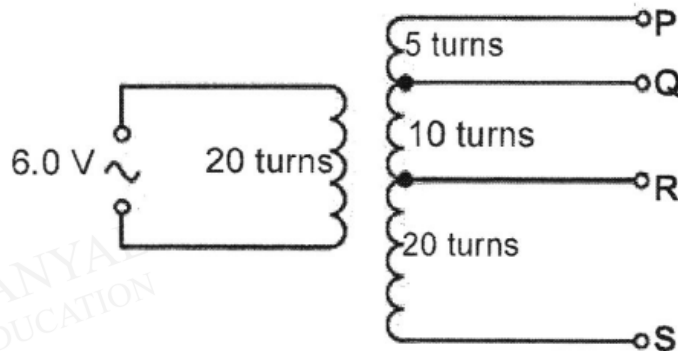


Fig. 37.1

Which pair of terminals should be connected such that the output will be 4.5 V?

- A PQ                      B QR                      C PR                      D QS

Q6

Fig. 38.1(a) shows a simple alternating current (a.c.) generator and Fig. 38.1(b) shows the initial voltage produced against time.

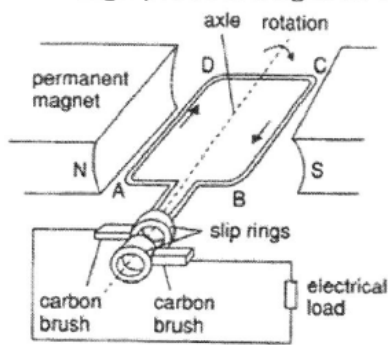


Fig. 38.1(a)

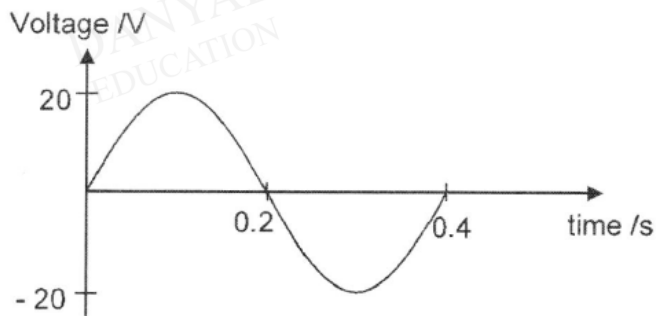


Fig. 38.1(b)

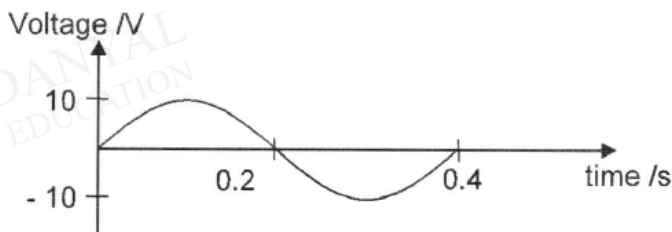


Fig. 38.2

After a certain change was made to the a.c. generator, the voltage against time waveform is as shown in Fig. 38.2. What is likely to be the change?

- A Reduce the rotating speed.
- B Use a magnet that has a weaker strength.
- C Increase the number of turns of the coil in the generator.
- D Place a soft iron core in the centre of the coil.

Q7

Fig. 39.1 shows a trace on the cathode ray oscilloscope (CRO) when a source is connected to it. The amplitude of the input source is 10.0 V and the time-base of the CRO is 5.0 ms/div. Find the voltage gain of the CRO display and the frequency of the input source.

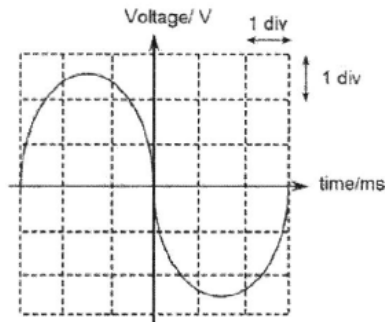


Fig. 39.1

Determine the voltage gain and the frequency of the trace.

	voltage gain / $V \text{ div}^{-1}$	Frequency / Hz
A	2.5	30
B	2.5	33
C	4.0	30
D	4.0	33

Q8

Fig. 40.1 shows a magnet moving up and down (between P and R) above a coil of copper wire.

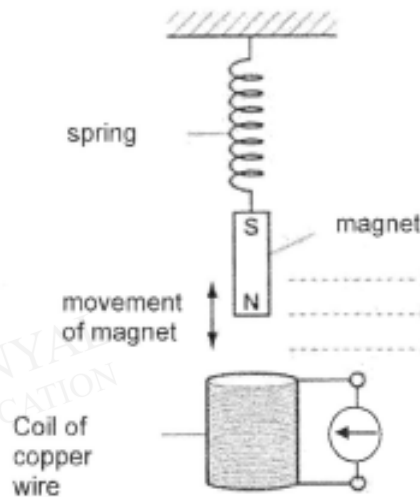


Fig. 40.1

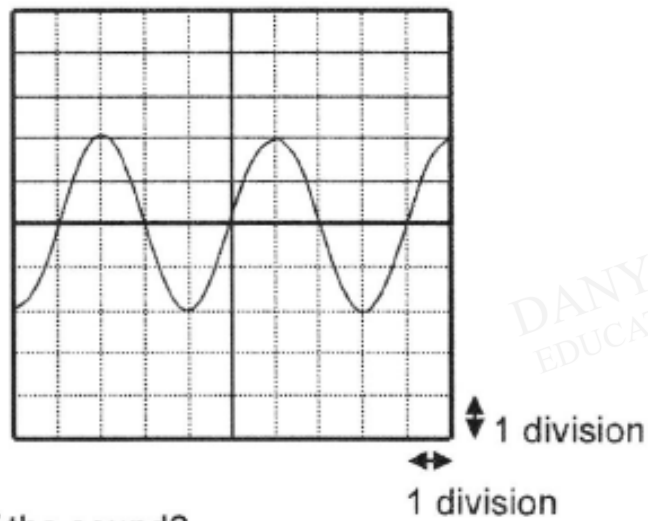
Which of the following statements are true?

- (i) An induced alternating current is formed in the coil as the magnet moves up and down.
- (ii) When the N-pole of the magnet is at P or R, the galvanometer does not show any deflection.
- (iii) The galvanometer will show bigger deflections when more turns are made to the coil of copper wire.

- A (i) and (ii) only
- B (ii) and (iii) only
- C (i) and (iii) only
- D (i), (ii) and (iii)

Q9

The diagram below shows oscilloscope trace of sound picked up by the microphone. The Y-gain is set at 2 V per division and the time base is set at 50 ms per division.

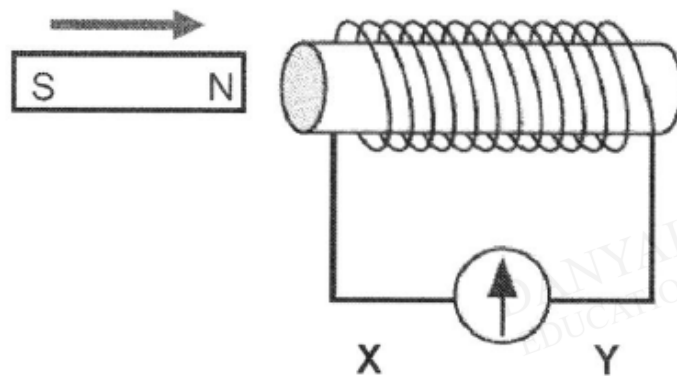


What is the frequency of the sound?

- |          |          |          |         |
|----------|----------|----------|---------|
| <b>A</b> | 0.040 Hz | <b>B</b> | 0.13 Hz |
| <b>C</b> | 5.0 Hz   | <b>D</b> | 10 Hz   |

Q10

A small coil is connected to a galvanometer as shown below.



When the magnet is allowed to move towards the coil, the current flows

- |          |                         |          |                          |
|----------|-------------------------|----------|--------------------------|
| <b>A</b> | momentarily from X to Y | <b>B</b> | continuously from X to Y |
| <b>C</b> | momentarily from Y to X | <b>D</b> | continuously from Y to X |

**Answers**

**Electromagnetic Induction Test 1.0**

Q1 B

Q2 D

Q3 C

Q4 B

Q5 C

Q6 B

Q7 D

Q8 D

Q9 C

Q10 A

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