O Level Pure Physics MCQs

Electromagnetic Induction Test 2.0

Q1

In the primary coil of a transformer, the current flowing through it is 2.5 A. The turn ratio of the transformer is 2.0 and the voltage in the secondary coil is given to be 100 V.
What is the power in the secondary coil if this is an ideal transformer?

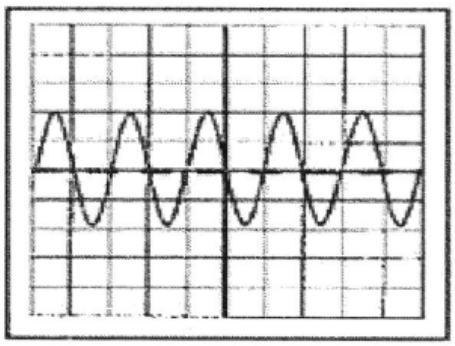
A	50 W	B	125 W
C	250 W	D	500 W

Q2

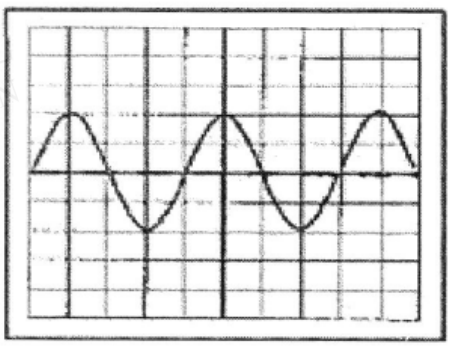
A cathode-ray oscilloscope (c.r.o.) is connected to a supply of amplitude 4.0 V and frequency 25 Hz. The time-base on the horizontal axis is set at 10 ms per division and the Y-gain on the vertical axis is set at 1.0 V per division.

Which of the following traces is obtained from the supply?

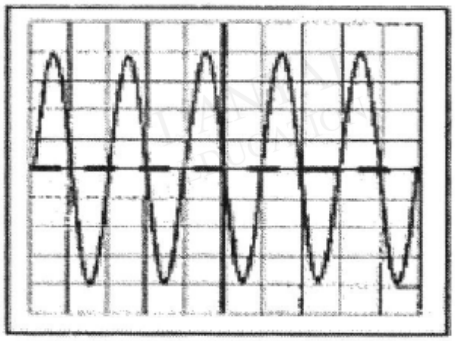
A



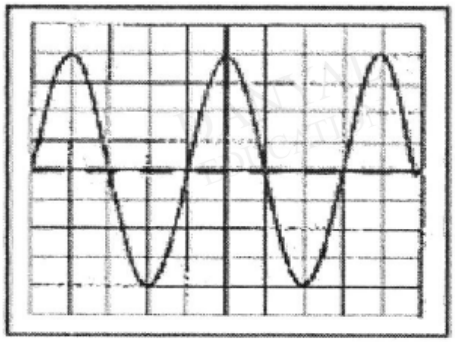
B



C



D



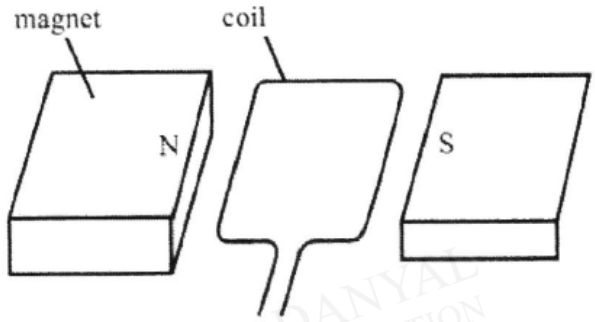
Q3

A coil of wire is rotating in a magnetic field. While rotating, it generates an alternating e.m.f. If the rate of rotation is increased, how will it affect the frequency and the peak value of the e.m.f.?

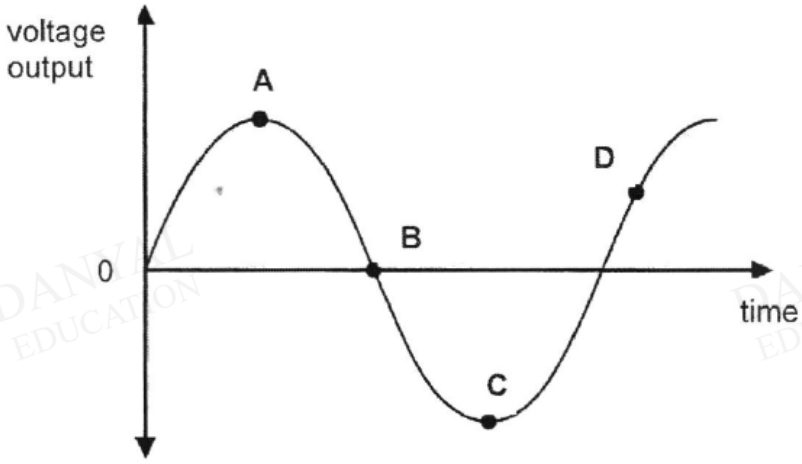
	Frequency	Peak Value
A	increases	increases
B	increases	Stay the same
C	decreases	increases
D	decreases	Stay the same

Q4

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

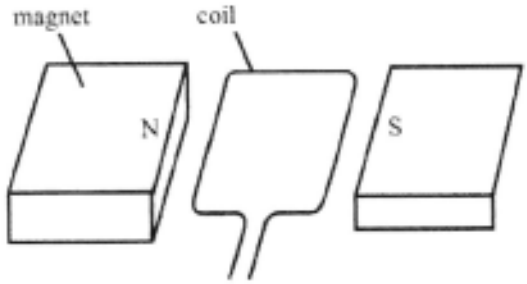


The graph shows the voltage output plotted against time. Which point on the graph shows the coil in a vertical position?

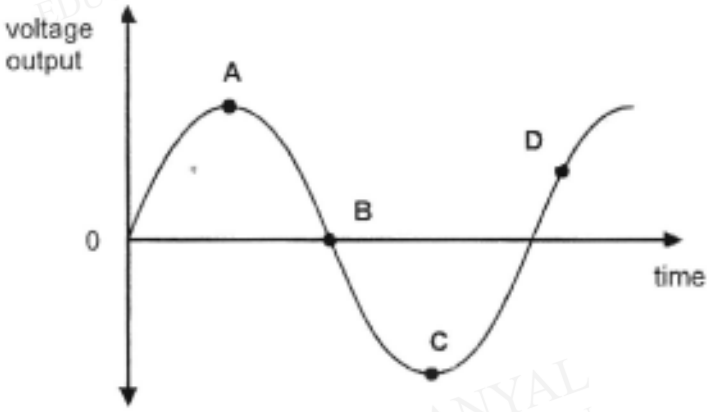


Q5

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

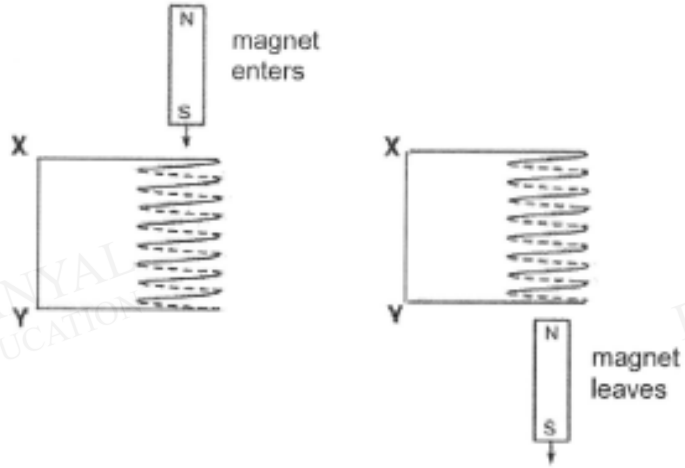


The graph shows the voltage output plotted against time. Which point on the graph shows the coil in a vertical position?



Q6

The diagrams below show the set-up for which a short bar magnet is dropped through a coil of wire.

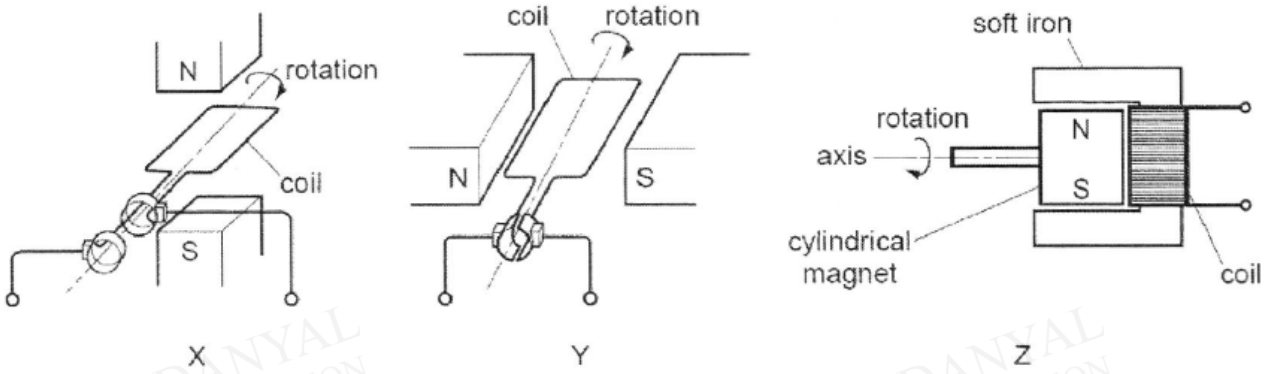


Which of the following correctly indicates the direction of the induced current between X and Y?

	as magnet enters the coil	as magnet leaves the coil
A	X to Y	X to Y
B	X to Y	Y to X
C	Y to X	X to Y
D	Y to X	Y to X

Q7

The following diagram shows three electrical generators.



Which generator(s) provide an alternating voltage?

A X only

B Y only

C X and Y

D X and Z

Q8

Voltage is stepped up for power transmission so that

A power loss in transmission cables is minimised.

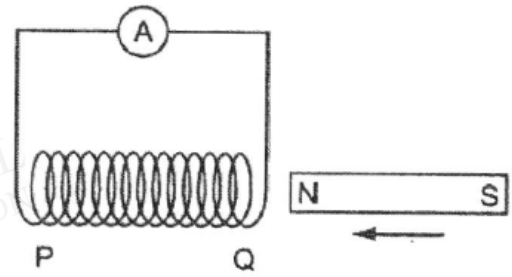
B resistance of transmission wires are reduced.

C current in the transmission wires are increased.

D more power is available to overcome resistance of transmission wires.

Q9

A bar magnet approaches a coil of wire PQ as shown below. The coil PQ is connected to a sensitive centre-zero ammeter.
As the N-pole of the magnet approaches end Q of the coil, the pointer of the sensitive centre-zero ammeter deflects momentarily to the right.
The N-pole of the magnet is then pulled towards the right, away from end Q of the coil, at a faster speed.

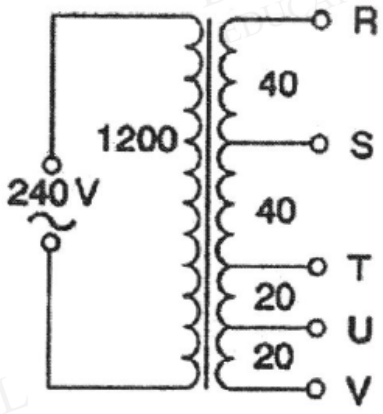


What would be observed on the pointer of centre-zero ammeter?

A It deflects to the left momentarily by a larger deflection.
B It deflects to the left momentarily by a smaller deflection.
C It deflects to the right momentarily by a larger deflection.
D It deflects to the right momentarily by a smaller deflection.

Q10

A transformer consists of a coil of 1200 turns and another coil, with a total of 120 turns, which can be tapped at various places.



A 20 V, 24 W lamp is to be lit normally.
Between which two terminals should you connect the lamp?

A Terminals R and S
B Terminals R and T
C Terminals R and U
D Terminals S and U

Answers

Electromagnetic Induction Test 2.0

Q1 B

Q2 D

Q3 A

Q4 B

Q5 D

Q6 C

Q7 D

Q8 A

Q9 A

Q10 C