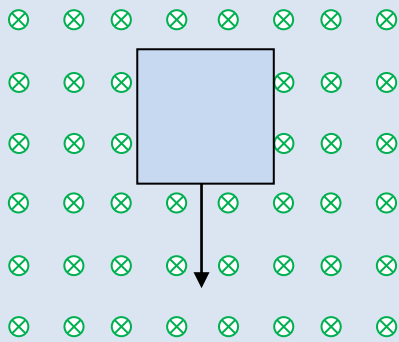


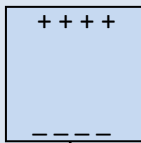
Quiz D20

Electromagnetic induction HL

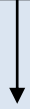
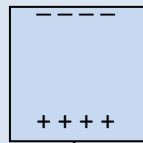
1. A sheet of metal is pushed through a region of magnetic field.



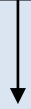
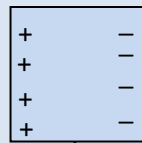
Which diagram shows the correct separation of charge in the sheet?



A



B

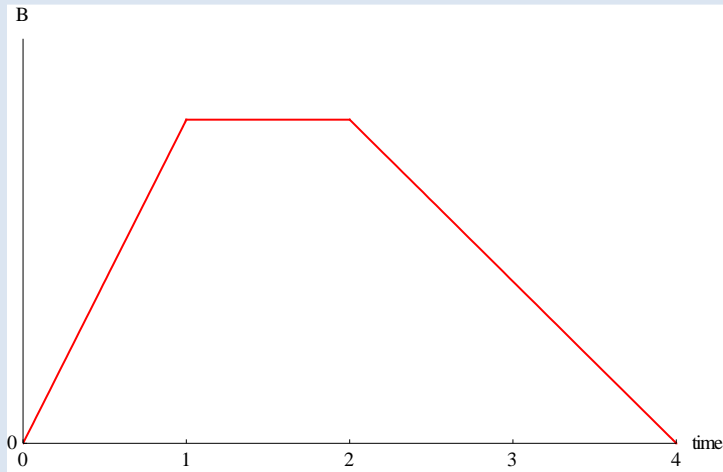


C

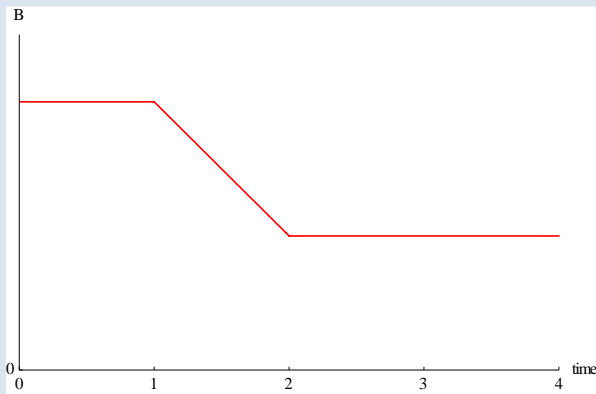


D

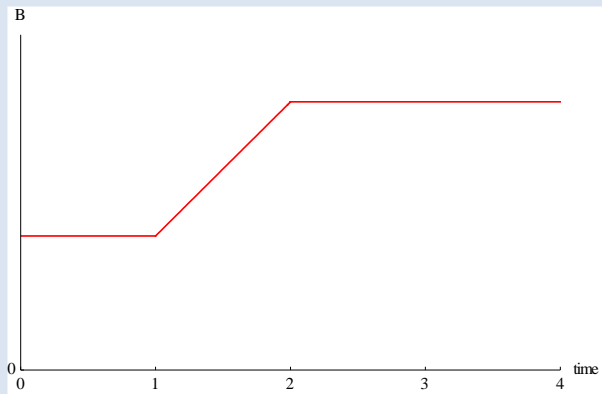
2. The magnetic field,  $B$ , in a loop varies with time as shown in the graph.



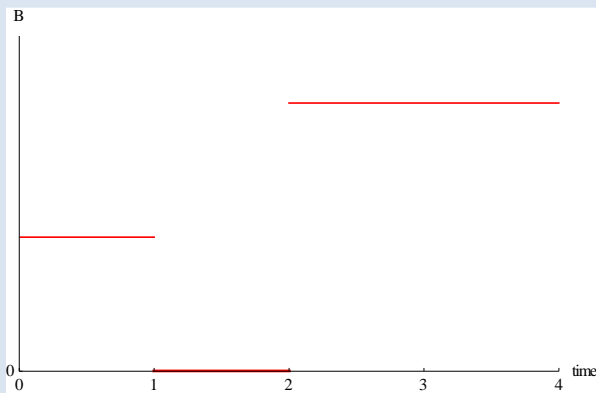
Which graph shows the correct variation with time of the magnitude of the induced emf in the loop?



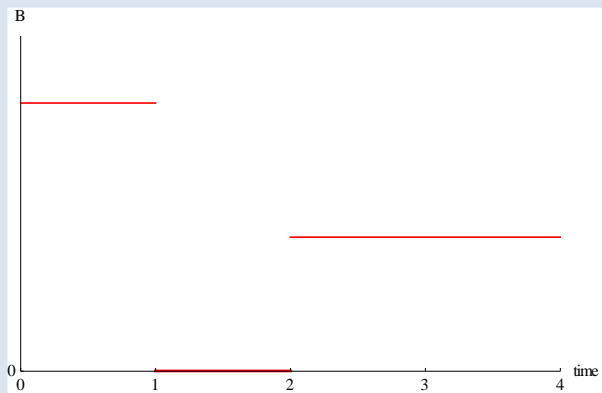
**A**



**B**

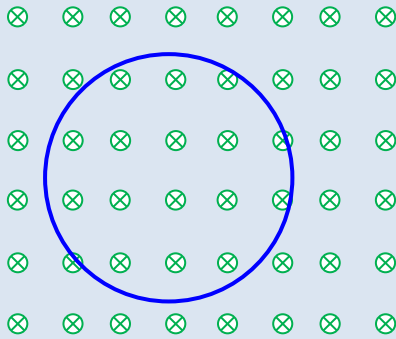


**C**



**D**

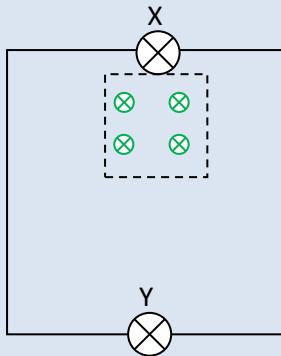
3. A conducting loop of wire is in a region of magnetic field that is directed into the plane of the paper.



What is the direction of the induced current in the loop when the magnitude of the magnetic field is increasing and what is it when it is decreasing?

	Field increasing	Field decreasing
<b>A</b>	Clockwise	Clockwise
<b>B</b>	Clockwise	Counterclockwise
<b>C</b>	Counterclockwise	Clockwise
<b>D</b>	Counterclockwise	Counterclockwise

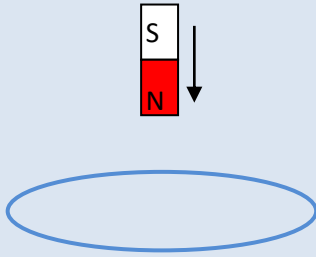
4. Two identical lamps, X and Y, are connected as shown. A magnetic field is directed into the plane of the page. The region of magnetic field is within the dotted square.



The magnitude of the field is increasing very rapidly. Which is correct?

- A** The lamps are not lit.
- B** The lamps are lit and are equally bright.
- C** The lamps are lit and X is brighter.
- D** The lamps are lit and Y is brighter.

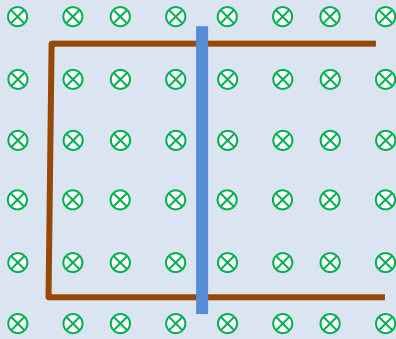
5. A magnet falls through a horizontal loop of wire.



At the position shown, what is the magnetic force on the magnet and what is the magnetic force on the loop?

	Force on magnet	Force on loop
<b>A</b>	Up	Up
<b>B</b>	Up	Down
<b>C</b>	Down	Up
<b>D</b>	Down	Down

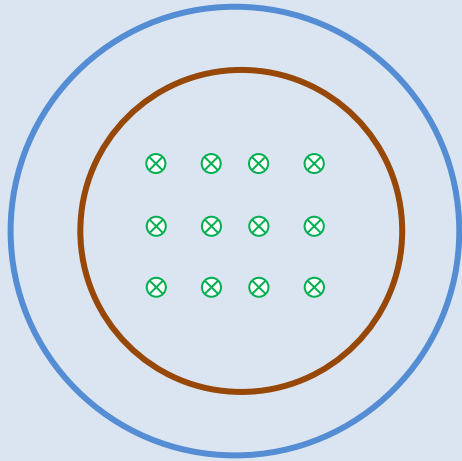
6. A cylindrical rod is placed on top of a rail. A magnetic field is pointing into the plane of the paper.



The magnitude of the field is decreasing. What will happen to the rod?

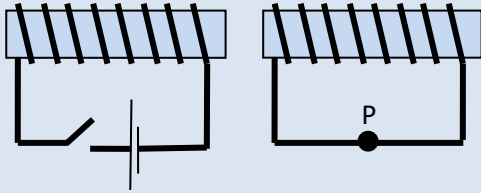
- A** It will stay in place.
- B** It will move to the left.
- C** It will move to the right.
- D** It will move out of the plane of paper.

7. Two loops of different size and material have a common centre. A magnetic field directed into the page is increasing rapidly.



What is correct?

- A The same emf will be induced in each loop.
  - B The induced emf will be larger in the larger loop.
  - C The induced emf will be larger in the smaller loop.
  - D The induced emf depends on the material of the loops.
8. Two identical coils are placed close to each other. The switch in the left coil is closed.

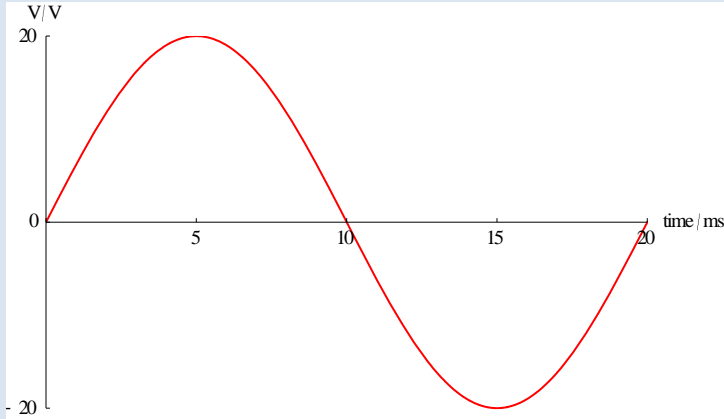


What is correct about the current through point P in the right coil immediately after the switch is closed and a long time after the switch is closed?

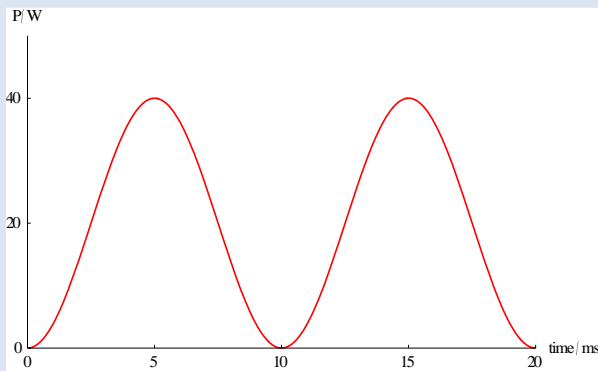
	Immediately after	Long time after
A	Current to the right	Zero
B	Current to the right	Constant but non-zero
C	Current to the left	Zero
D	Current to the left	Constant but non-zero

**This graph applies to problems 9 and 10**

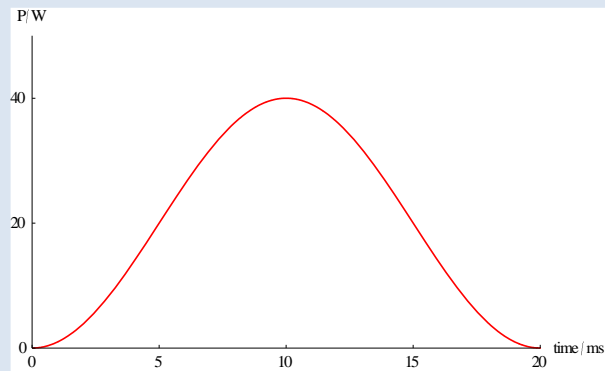
The graph shows the variation of the voltage across a resistor of resistance  $10\ \Omega$ .



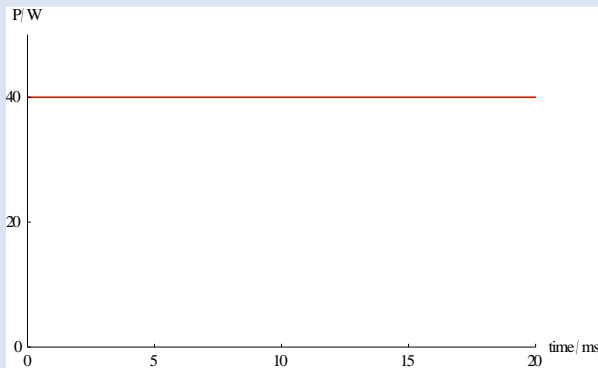
9. Which graph shows the variation with time of the average power dissipated in the resistor?



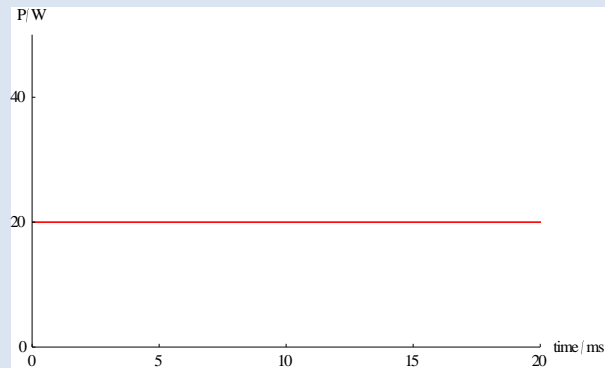
**A**



**B**

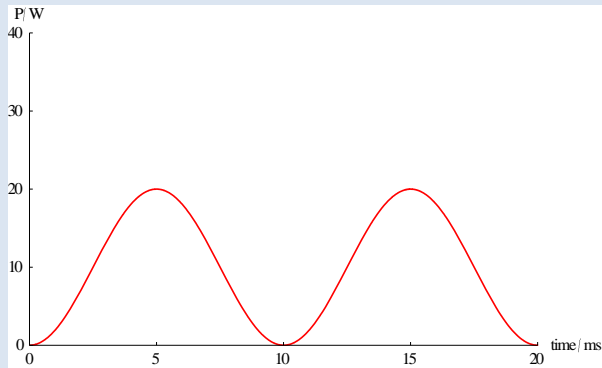


**C**

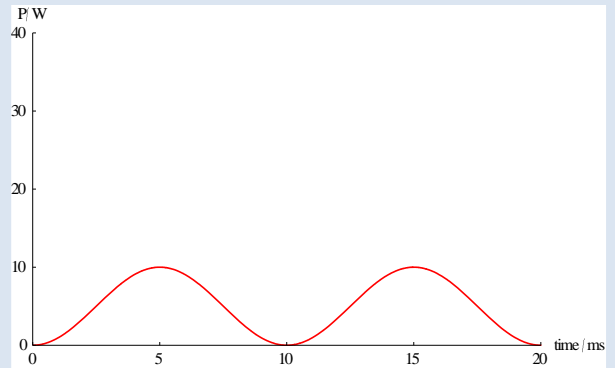


**D**

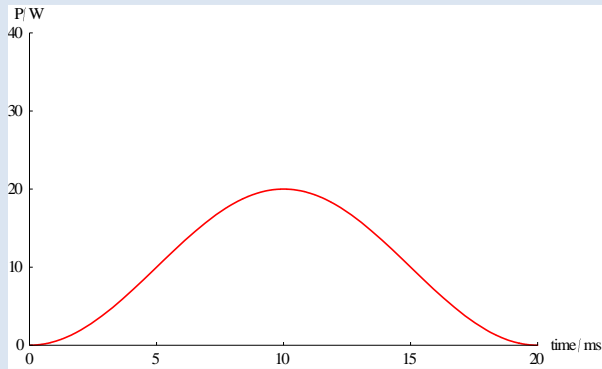
10. The speed of rotation of the coils is halved. Which graph shows the variation with time of the power dissipated in the resistor?



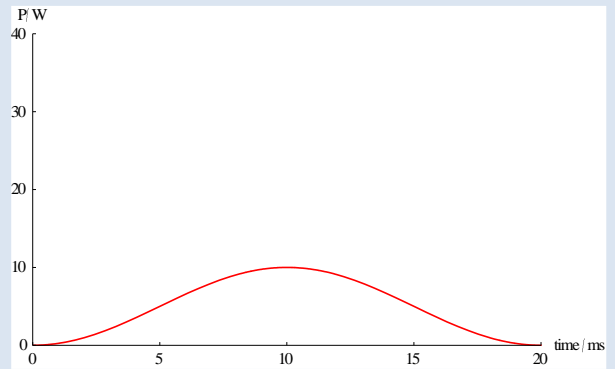
**A**



**B**



**C**



**D**

<b>Quiz D20 Answers</b>	
<b>1</b>	<b>D</b>
<b>2</b>	<b>D</b>
<b>3</b>	<b>C</b>
<b>4</b>	<b>B</b>
<b>5</b>	<b>B</b>
<b>6</b>	<b>C</b>
<b>7</b>	<b>A</b>
<b>8</b>	<b>A</b>
<b>9</b>	<b>D</b>
<b>10</b>	<b>D</b>