

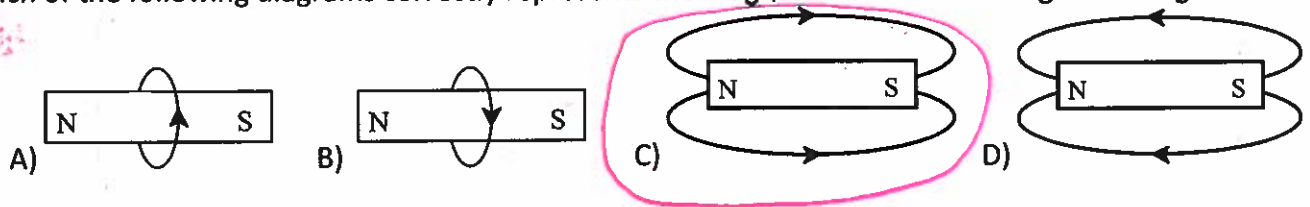
Multiple Choice Questions – Answer in the space provided.

2 marks each

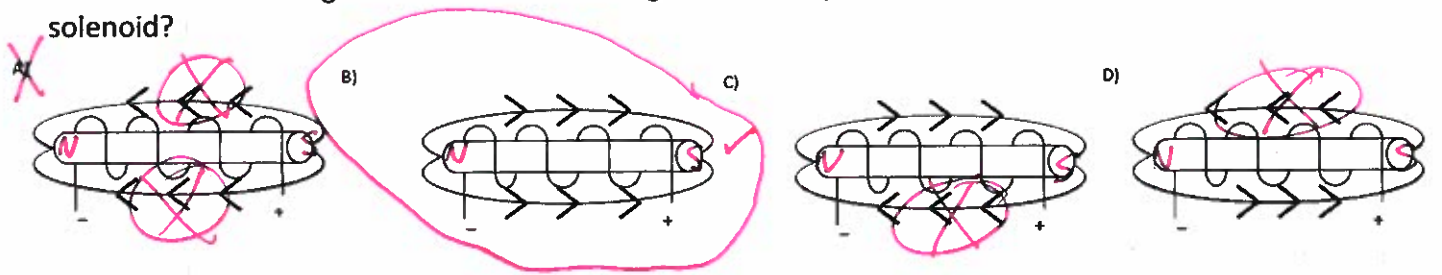
1. Which of the following **does not** increase the strength of an electromagnet?

- A) increasing # of loops
- B) increasing the current
- C) using a denser core**
- D) using a core with lower magnetic resonance.

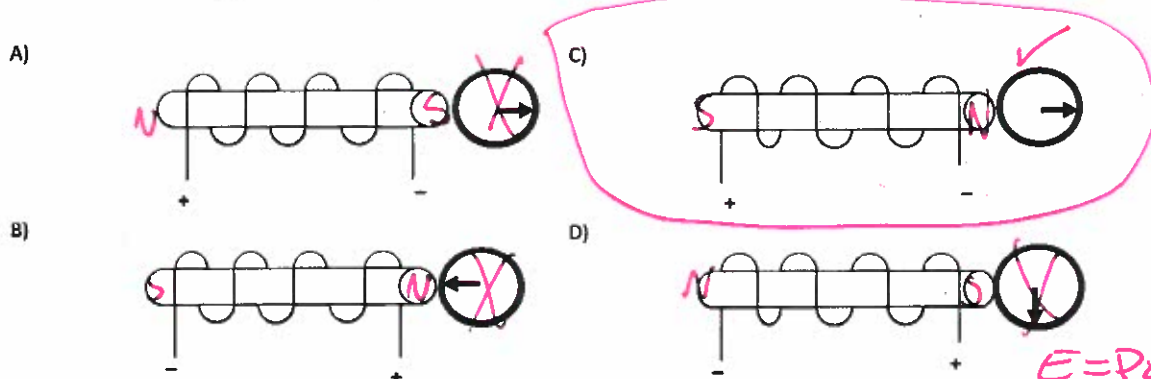
2. Which of the following diagrams correctly represents the magnetic field surrounding a bar magnet?



3. A current flows through a solenoid. Which diagram correctly illustrates the magnetic field produced by the solenoid?



4. A compass is placed at one end of a solenoid. Which compass is pointing in the correct direction?



5. What quantity of energy will a 2 700 Watt circuit consume in one day (24hrs)?

- A) 2 700 kWh
- B) 162 kWh
- C) 112.5 kWh
- D) 64.8 kWh**

$2700 \div 1000 = 2.7 \text{ kW}$

$E = P \Delta t$   
 $= 2.7 \times 24$   
 $= 64.8 \text{ kWh}$

6. A stereo has a power rating of 220 W & is used for 40 min. How much energy was consumed?

- A) 528 000 J**
- B) 8 800 J
- C) 528 J
- D) 5.5 J

$E = P \Delta t$   
 $= 220 (40 \times 60)$

7. Given the information in the table, which circuit has the **lowest** resistance?

$V = IR$   
 $R = \frac{V}{I}$

	Circuit 1	Circuit 2	Circuit 3	Circuit 4
Potential Difference	220 V	50 V	30 V	200 V
Current intensity	0.4 A	2.0 A	0.6 A	5.0 A

- A) Circuit 1
- B) Circuit 2**  $R = 550 \Omega$
- C) Circuit 3  $R = 25 \Omega$
- D) Circuit 4  $R = 50 \Omega$   $R = 40 \Omega$

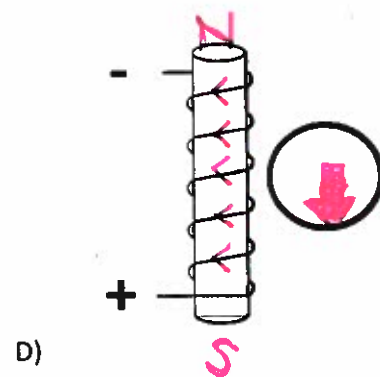
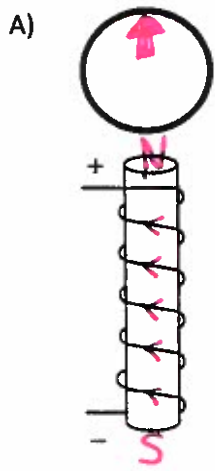
8. Which electromagnetic would generate the strongest magnetic field?

	A	<b>B</b>	C	<del>D</del>
Current Intensity	2 A	4 A	4 A	6 A
Wire Material	Copper	Copper	Copper	Nichrome
Core Material	Iron	Cobalt	Nickel	<del>Copper</del>

$F = IN$   
 $2 \times 15 = 30$        $4 \times 20 = 80$        $4 \times 15 = 60$

Multiple Choice Answers	
1	C
2	C
3	B
4	C
5	D
6	A
7	B
8	B

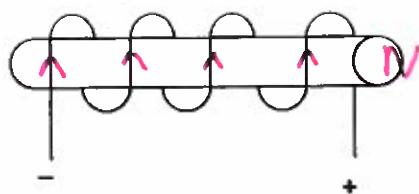
9. Draw the arrow of the compass in the diagrams below. (2) Compass =



Short Answer questions

10. State whether the following will attract or repel. (2)

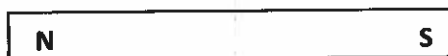
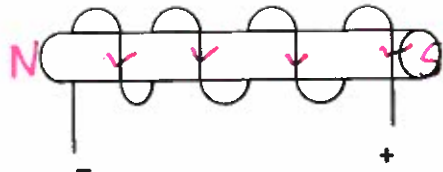
a.



Attract

Repel

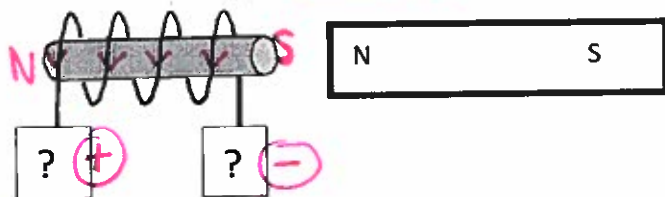
b.



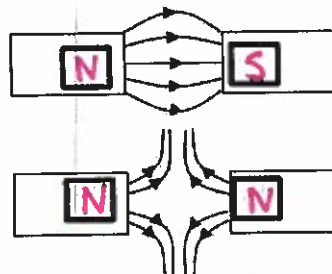
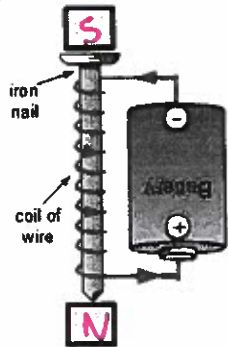
Attract

Repel

11. The core on the left is attracted to the bar magnet on the right. Determine the + and - ends of the wire. (1)



12. Indicate the north and south ends of the nail and the magnets. (2)



Digit	0	1	2	3	4	5	6	7	8	9		
Colour	Black	Brown	Red	Orange	Yellow	Green	Blue	Violet	Grey	White	Gold	Silver
Tolerance											±5%	±10%

13. Find the strength of the following resistors, and then calculate their ranges. (2)

Band Colours	Strength	Range
Yellow, Green, Brown, Gold	450 Ω ± 5%	427.5 Ω to 472.5 Ω
Red, Grey, Black, Silver	28 Ω ± 10%	25.2 Ω to 30.8 Ω

13. Give the band colours for a 65 000 Ω ± 5% resistor: Blue, Green, Orange, Gold. (1)

14. Matt consumed electrical energy in the following ways while getting ready for school: (4)

- 1 o he dried his hair for 15 min with a 1250 W hair-dryer ;
- 2 o he left the lights on in his bedroom while he was getting ready for school (52 min).  
The light fixture in his bedroom has 2 bulbs of 100 W each;
- 3 o he watched TV for 2 ½ hrs (television : 300 W).

A) What was the total energy consumed? (Your choice J or kWh.)

①  $\frac{15}{60} = 0.25\text{h}$

$1250\text{W} \div 1000 = 1.25\text{ kW} \times 0.25\text{h} = 0.3125\text{ kWh}$

②  $\frac{52}{60} = 0.8\bar{6}\text{h}$

$200\text{W} \div 1000 = 0.2\text{ kW} \times 0.8\bar{6}\text{h} = 0.173\bar{3}\text{ kWh}$

③  $300\text{W} \div 1000 = 0.3\text{ kW} \times 2.5\text{h} = 0.75\text{ kWh}$

1.23583 kWh

1.24 kWh

①  $15 \times 60 = 900\text{s}$

$E = P \Delta t = 1250 \times 900 = 1125000$

②  $52 \times 60 = 3120\text{s}$

$E = P \Delta t = 200 \times 3120 = 624000$

OR ③  $2.5 \times 60 \times 60 = 9000$

$E = P \Delta t = 300 \times 9000 = 2700000$

4449000

B) If Hydro-Québec charges \$0.0785/kWh, how much did Matt have to pay for the energy he used that day?

$1.23583\text{ kWh} \times 0.0785 = 0.0970 \dots \rightarrow 0.10$

$\frac{1\text{ kWh} = 3600000}{\times 4449000}$

$\times 1.235833 \times 0.0785 = 0.0970 \rightarrow 0.10$

15. You enjoyed swimming in your pool this summer. You swam 110 days in total for an average of 5.5hrs/day. After receiving the bill, your parents noticed that the pool's heat pump consumed 3950 kWh of energy over the summer! They hope to replace it with a more efficient heater. The store is selling one that uses 240 V and 22 A.

Should they replace it? Show calculations to justify your answer. (4)

$110 \times 5.5 = 605\text{h}$  ①

$P = VI = 240 \times 22 = 5280\text{W}$  ①

$5280 \div 1000 = 5.28\text{ kW}$  ①

$5.28\text{ kW} \times 605\text{h} = 3194.4\text{ kWh}$  ①

Yes they should replace it.  
It will use less energy.

$\frac{1\text{ kWh} = 3600000}{3950\text{ kWh} \times}$

$x = 1.422 \times 10^6 \text{ J}$

vs.

$P = VI = 240 \times 22 = 5280\text{W}$

$E = P \Delta t = 5280\text{W} \times 2178000 = 1.15$

$\Delta t = 110 \times 5.5 \times 60 \times 60 = 2178000$

/8

If it was on...could I do this?

