

**9** You rub a balloon on your hair in order to stick the balloon on the wall?

Which of the following statements is TRUE?

- A) When rubbed together, both the balloon and your hair become positively charged.
- B) When rubbed together, both the balloon and your hair become negatively charged.
- C) When rubbed together, the balloon remains neutral and your hair becomes negatively charged.
- D) When rubbed together, the balloon becomes negatively charged and your hair becomes positively charged.

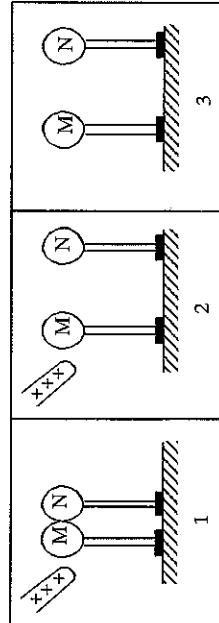
**10** Electrical components are used to transform electrical energy into other forms of energy. What form of energy do the piezoelectric crystals, found in watches and speakers, transform electrical energy into?

- A) mechanical
- B) Thermal
- C) Magnetic
- D) Chemical

**11** Two conducting spheres M and N, on insulating supports, are in contact with each other. At first they are not charged.

The following three operations are performed: (see diagram next page)

1. A positively charged rod is brought close to sphere M, without touching it.
2. With the rod close to sphere M, sphere N is moved away from sphere M.
3. The charged rod is moved away.



What are the charges on the spheres M and N after the operations?

- A) Negative for sphere M, positive for sphere N
- B) Negative for sphere M, no charge for sphere N
- C) Negative for spheres M and N
- D) Positive for spheres M and N

**12** Which of the following statements about circuit breakers is false?

- A) Circuit breakers have a switch that can be flipped to restore circuit operation.
- B) Circuit breakers act as protective devices in electrical circuits.
- C) Some circuit breakers have bimetallic strips that get bent when they are activated.
- D) Circuit breakers need to be replaced after they are blown.

**13** In the laboratory, you are given three different substances:

- 1. a magnetic substance
- 2. a ferromagnetic substance
- 3. a non-magnetic substance

Which of the following observations is correct?

- A) Substances 1 and 2 repel each other.
- B) Substances 1 and 2 attract each other.
- C) Substances 1 and 3 attract each other.
- D) Substances 2 and 3 attract each other.

**14** In the laboratory, an orange solid was heated in an open container. The following observations were made:

- 1. The temperature of the solid increased.
- 2. The solid turned black.
- 3. The solid became granular.
- 4. The mass of the solid increased.

Which of these observations allow you to conclude that a chemical change took place?

- A) 1 and 3
- B) 1 and 4
- C) 2 and 3
- D) 2 and 4

**Feb 2013 Part A Multiple Choice Each question is worth 4 marks**

- 1 A flat iron used on hair for 8 minutes consumes 576 000 J of electrical energy.
- What is the power of this iron?
- A) 20 W B) 72 W C) 1200 W D) 72 000 W

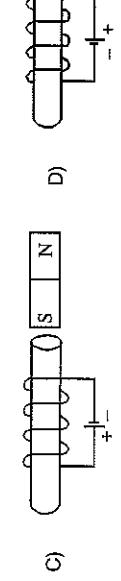
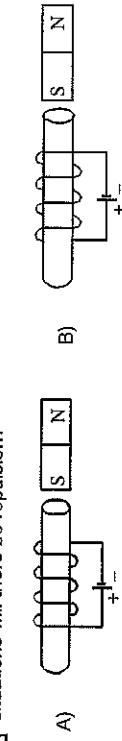
- 1 An motor operates on 3.0 A, using a battery that supplies 216 840 Coulombs of electrons. How long will you be able to use this motor without recharging the battery?
- A) 1205 hr B) 20 hr C) 10 842 hr D) 72 280 hr

- 2 A domestic power supply of 110 V is protected by a 20 A fuse.

- What is the maximum number of light bulbs with specifications 110 V - 75 W, that can be installed in this circuit without blowing the fuse?

- A) 24 B) 18 C) 6 D) 29

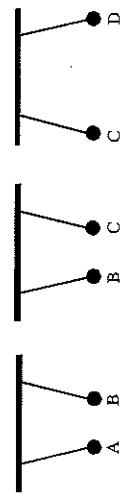
- 3 A bar magnet is brought close to a current-bearing solenoid. In which one of the following situations will there be repulsion?



- 4 Rank the following electromagnets in order of strongest to weakest magnetic field. (Where 1 is the strongest)

Electromagnet	Material	Current Intensity	Rank (1 <sup>st</sup> , 2 <sup>nd</sup> , 3 <sup>rd</sup> , 4 <sup>th</sup> )
A	Iron	4A	
B	Wood	3A	
C	Iron	5A	
D	Iron	4A	

- 5 We are given four spheres, A, B, C and D. Sphere A is positively charged and the charges on spheres B, C and D are unknown.
- The following diagram shows what happens to these spheres if we suspend them two by two close to each other.



Given the diagram above, what are the charges on spheres C and D?

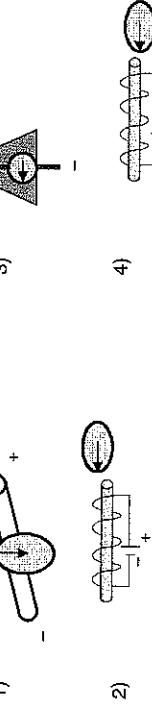
- A) Sphere C is positively charged and sphere D is negatively charged.  
 B) Sphere C is positively charged and sphere D is positively charged.  
 C) Sphere C is negatively charged and sphere D is negatively charged.  
 D) Sphere C is negatively charged and sphere D is positively charged.

- 6 Ceramic is used to support electrical wires on poles.
- Which properties of ceramic make it desirable for this use?

1. Is a good insulator 2. Does not rust 3. Is not ductile 4. Breaks easily  
 A) 1 and 2 B) 1 and 3 C) 2 and 3 D) 3 and 4

- 7 A compass is placed near a magnetic field. Which of the following diagrams show the compass needle pointing in the correct direction?

- A) A B C D  
 B) C A D B  
 C) D C B A  
 D) D A C B



- A) 2 & 3 B) 3 & 4 C) 1 & 2 D) 1 & 3