

### **A: Permanent and induced magnetism, magnetic forces and fields**

1. What are the poles of a magnet?
2. When two magnets are brought together what do they do?
3. When a magnet and a magnetic material are brought together what do they do?
4. What is a permanent magnet?
5. What is an induced magnet?
6. Describe the difference between permanent and induced magnets.
7. Which part of a magnet has the strongest magnetic field?
8. Two magnets are placed close together, north seeking pole to north seeking pole. Describe the forces acting on the two magnets.
9. Name three magnetic elements.
10. Describe two methods for finding the magnetic field pattern of a bar magnet.
11. Draw the magnetic field pattern of a bar magnet.
12. How would you describe the direction of a magnetic field line?
13. What does a magnetic compass contain?
14. Which way does the compass needle point?
15. What do scientists think is the cause of the Earth's magnetic field?

### **B: The Motor Effect**

1. What is produced when a current flows through a conducting wire?
2. Name two factors which will impact on your answer to question 1.
3. What is a solenoid?
4. What is an electromagnet?
5. Describe the magnetic field inside a solenoid.

6. State three ways of increasing the strength of the magnetic field produced by a solenoid.
7. Draw the magnetic field pattern produced by a solenoid.
8. (Physics only) Describe how a relay works.
9. (Physics only) An electric bell uses a solenoid. Use the diagram below, and your own knowledge, to explain how an electric bell works.
10. (HT) Describe the motor effect.
11. (HT) What 3 factors does Fleming's left hand-rule represent?
12. (HT) Give three ways of making the electric motor spin faster.
13. (HT) A 40 cm piece of wire is placed in a magnetic field of strength 0.4 T. The wire carries a current of 60 mA.  
Work out the force on the wire using the equation: Force = magnetic flux density x current x length.
14. (Physics HT only) Explain how a loudspeaker works.

### **C: Induced Potential, Transformers and the National Grid (Physics HT only)**

1. What does the term 'induced current' mean?
2. What is a simple generator made of?
3. How can the size of the induced potential difference/ current in a generator be increased?
4. What factors affect the direction of the induced potential difference/ current?
5. What type of current is induced by an alternator?
6. What type of current is produced by a dynamo?
7. Describe two ways of reversing the direction of current flow on a dynamo.
8. At which point of the rotation does a dynamo induce the greatest potential difference?
9. How do microphones use the generator effect?
10. What does a basic transformer contain?
11. Why are cores made of iron?

12. What can be said about the potential difference in the primary and secondary coils of a step-down transformer?
13. How do transformers work?
14. A step-up transformer is used in a power station to increase the potential difference output from 25,000 V to 400,000 V. The current through the overhead power lines is 25 A. Work out the current in the primary coil.  $V_s \times I_s = V_p \times I_p$
15. Why are transformers used when sending electricity through the National Grid?