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Question 24 (Answer: **D**)

- The magnetic field is strongest where the field lines are packed most closely together.
- It is weakest where they are furthest apart.
- So rank the three positions by how tightly the lines are spaced around each.

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Question 24 (Answer: **A**)

- Permanent magnets are made of steel, which is magnetically hard – statement 1 is right.
- An electromagnet loses its magnetism when the current stops, so it is temporary – statement 2 is right.
- Bringing a magnet near an iron bar induces magnetism in it – statement 3 is right too.

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Question 24 (Answer: **A**)

- Outside a magnet, field lines always run from the north pole to the south pole.
- So the arrow direction tells you which end is which.
- Where two magnets are held together the touching poles must be opposite, or they would repel.

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6(a)	any **one** from: • magnetic materials are attracted to magnets • non-magnetic materials are not attracted to magnets • magnetic materials experience a force in magnetic fields • non-magnetic materials don't experience a force in magnetic fields
6(b)	any **one** from: • steel as it stays magnetised • steel makes a permanent magnet
6(c)	N and S poles correctly labelled braille: north to south owtte
6(d)	field lines close(r) indicates strong(er) (magnetic) field owtte ORA

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Question 24 (Answer: **B**)

- A temporary magnet must magnetise and demagnetise easily – a *soft* material.
- A permanent magnet must keep its magnetism – a *hard* material.
- Soft iron is the temporary one and steel the permanent one.

Question 25 (Answer: **A**)

- Magnetic field strength is shown by how close together the field lines are.
- The field is strongest where the lines are most tightly packed.
- That is nearest the poles, where the lines converge.

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Question 24 (Answer: **D**)

- A permanent magnet must keep its magnetism, so it needs a magnetically *hard* material – steel.
- An electromagnet's core must magnetise and demagnetise easily, so it needs a *soft* one – iron.
- Copper is not magnetic at all, so it can be neither.

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Question 23 (Answer: **C**)

- A magnet induces the *opposite* pole in the nearby end of a piece of soft iron.
- Opposite poles attract, so the iron is always pulled *towards* the magnet.
- So end X takes the pole opposite to the magnet's nearest face, and the force on the iron is towards the magnet.